DOE/ME-0032
Volume 1

Department of Energy FY 2005 Congressional Budget Request

National Nuclear Security Administration

Office of the Administrator

Weapons Activities

Defense Nuclear Nonproliferation

Naval Reactors

February 2004

Office of Management, Budget and Evaluation/CFO

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The Department of Energy's FY 2005 Congressional Budget justification is available on the Office of Management, Budget and Evaluation/CFO homepage at http://www.mbe.doe.gov/budget/

Department of Energy
Appropriation Account Summary
(dollars in thousands -OMB Scoring)

	FY 2003 Comparable Approp	FY 2004 Comparable Approp	FY 2005 Congress Request	FY 2005 vs. FY 2004	
Energy and Water Development					
Energy Programs					
Energy supply	730,215	788,620	835,266	+46,646	+5.9%
Non-Defense site acceleration completion	156,129	162,411	151,850	-10,561	-6.5%
Uranium enrichment D&D fund	320,563	414,027	500,200	+86,173	+20.8%
Non-Defense environmental services	161,852	306,439	291,296	-15,143	-4.9%
Science	3,322,244	3,500,169	3,431,718	-68,451	-2.0%
Nuclear waste disposal	144,058	188,879	749,000	+560,121	+296.6%
Departmental administration	89,219	93,720	122,611	+28,891	+30.8%
Inspector general	37,426	39,229	41,508	+2,279	+5.8%
Total, Energy Programs	4,961,706	5,493,494	6,123,449	+629,955	+11.5%
Atomic Energy Defense Activities					
National nuclear security administration:					
Weapons activities	5,961,345	6,233,503	6,568,453	+334,950	+5.4%
Defense nuclear nonproliferation	1,223,453	1,334,040	1,348,647	+14,607	+1.1%
Naval reactors	702,196	761,878	797,900	+36,022	+4.7%
Office of the administrator	330,314	336,826	333,700	-3,126	-0.9%
Total, National nuclear security administration	8,217,308	8,666,247	9,048,700	+382,453	+4.4%
Environmental and other defense activities:					
Defense site acceleration completion	5,496,409	5,576,760	5,970,837	+394,077	+7.1%
Defense environmental services	1,105,778	1,012,610	982,470	-30,140	-3.0%
Other defense activities	637,125	670,083	663,636	-6,447	-1.0%
Defense nuclear waste disposal	312,952	387,699	131,000	-256,699	-66.2%
Total, Environmental & other defense activities	7,552,264	7,647,152	7,747,943	+100,791	+1.3%
Total, Atomic Energy Defense Activities	15,769,572	16,313,399	16,796,643	+483,244	+3.0%
Defense EM privatization (rescission)	——	-15,329	——	+15,329	100%
Power marketing administrations:					
Southeastern power administration	4,505	5,070	5,200	+130	+2.6%
Southwestern power administration	27,200	28,431	29,352	+921	+3.2%
Western area power administration	167,760	176,900	173,100	-3,800	-2.1%
Falcon & Amistad operating & maintenance fund	2,716	2,625	2,827	+202	+7.7%
Total, Power marketing administrations	202,181	213,026	210,479	-2,547	-1.2%
Federal energy regulatory commission	——	——	——	——	——
Subtotal, Energy and Water Development	**20,933,459**	**22,004,590**	**23,130,571**	**+1,125,981**	**+5.1%**
Uranium enrichment D&D fund discretionary payments	-432,731	-449,333	-463,000	-13,667	-3.0%
Excess fees and recoveries, FERC	-22,669	-18,000	-15,000	+3,000	+16.7%
Colorado River Basins	-22,000	-22,000	-23,000	-1,000	-4.5%
Total, Energy and Water Development	**20,456,059**	**21,515,257**	**22,629,571**	**+1,114,314**	**+5.2%**

Department of Energy
Appropriation Account Summary
(dollars in thousands -OMB Scoring)

	FY 2003 Comparable Approp	FY 2004 Comparable Approp	FY 2005 Congress Request	FY 2005 vs. FY 2004	
Interior and Related Agencies					
Fossil energy research and development........................	611,149	672,771	635,799	-36,972	-5.5%
Naval petroleum and oil shale reserves..........................	17,715	17,995	20,000	+2,005	+11.1%
Elk Hills school lands fund...	36,000	36,000	36,000	——	——
Energy conservation..	880,176	877,984	875,933	-2,051	-0.2%
Economic regulation..	1,477	1,034	——	-1,034	-100.0%
Strategic petroleum reserve..	171,732	170,948	172,100	+1,152	+0.7%
Strategic petroleum account...	1,955	——	——	——	——
Northeast home heating oil reserve................................	5,961	4,939	5,000	+61	+1.2%
Energy information administration..................................	80,087	81,100	85,000	+3,900	+4.8%
Subtotal, Interior Accounts..	1,806,252	1,862,771	1,829,832	-32,939	-1.8%
Clean coal technology..	-47,000	-98,000	-140,000	-42,000	-42.9%
Total, Interior and Related Agencies..............................	**1,759,252**	**1,764,771**	**1,689,832**	**-74,939**	**-4.2%**
Total, Discretionary Funding...	**22,215,311**	**23,280,028**	**24,319,403**	**+1,039,375**	**+4.5%**
Yucca mountain--mandatory collection to offset discretionary funding...	——	——	-749,000	-749,000	n/a
Total, Discretionary Funding...	**22,215,311**	**23,280,028**	**23,570,403**	**+290,375**	**+1.2%**

National Nuclear Security Administration

Overview

Appropriation and Program Summary

(dollars in millions)

	FY 2003 Comparable Appropriation	FY 2004 Original Appropriation	FY 2004 Adjustments	FY 2004 Comparable Appropriation	FY 2005 Request
Office of the Administrator	330	340	- 3	337	334
Weapons Activities.............	5,961	6,273	- 39	6,234	6,568
Defense Nuclear Nonproliferation..................	1,224	1,328	+ 6	1,334	1,349
Naval Reactors....................	702	766	- 4	762	798
Total, NNSA	8,217	8,707	- 40	8,667	9,049

The NNSA budget justification contains the required three years of budget and performance information, as well as similar information for five years as required by Sec. 3253 of P.L. 106-065. This section, entitled *Future-Years Nuclear Security Program*, requires the Administrator to submit to Congress each year at the time the budget is submitted the estimated expenditures necessary to support the programs, projects and activities of the NNSA for a five fiscal year period, in a level of detail comparable to that contained in the budget. Since the inception of NNSA, the Future Years Nuclear Security Program (FYNSP) has been provided as a separate document supporting the budget request. Starting with this budget, NNSA will include this outyear budget and performance information as part of a fully integrated budget submission.

Future Years Nuclear Security Program (FYNSP) Schedule

(dollars in millions)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
Office of the Administrator.................	334	340	347	353	360	1,734
Weapons Activities	6,568	6,881	7,216	7,353	7,492	35,510
Defense Nuclear Nonproliferation	1,349	1,381	1,410	1,441	1,465	7,046
Naval Reactors..................................	798	803	818	834	850	4,103
Total, NNSA	9,049	9,405	9,791	9,981	10,167	48,393

FY 2003 Execution

(dollars in millions)

	FY 2003 Approp	PY Balance/ General Reduction	Rescission	Supple-mental	Reprogram-mings	Comp Adjust-ments	Current FY 2003 Comp
Office of the Administrator	331	0	- 2	0	6	- 5	330
Weapons Activities	6,093	- 139	- 39	67	0	- 21	5,961
Defense Nuclear Nonproliferation	1,189	- 75	- 7	148	- 33	2	1,224
Naval Reactors	707	0	- 5	0	0	0	702
Total, NNSA	8,320	- 214	- 53	215	- 27	- 24	8,217

FY 2004 Appropriation

(dollars in millions)

	FY 2004 Enacted Approp	PY Balance/ General Reduction	Pending 0.59% Rescission	Supple-mental	Reappropria tion and Reprogram-mings	Comp Adjust-ments	Current FY 2004 Comp
Office of the Administrator	340	0	- 2	0	0	- 1	337
Weapons Activities	6,367	- 95	- 37	0	-2	0	6,234
Defense Nuclear Nonproliferation	1,373	- 45	- 8	0	+12	+ 2	1,334
Naval Reactors	768	- 2	- 4	0	0	0	762
Total, NNSA	8,848	- 142	- 51	0	+10	+ 1	8,667

Preface

The NNSA was created by the Congress in 2000 to focus the management of the nation's defense nuclear security through a single, separately organized and managed agency within the Department of Energy (DOE). The NNSA brought together three existing major program components that maintain all of the weapons in the U.S. nuclear weapon stockpile, lead the Administration's efforts to reduce and prevent the proliferation of nuclear weapons, materials and expertise, and provide cradle-to-grave support for the Navy fleet's nuclear propulsion.

The NNSA is funded through four appropriations. Within the Weapons Activities appropriation, NNSA has one program, Weapons Activities, and 13 subprograms. The Defense Nuclear Nonproliferation appropriation has one program, Defense Nuclear Nonproliferation, with 7 subprograms. The Naval Reactors appropriation supports all activities for that program, with no subprograms. The Office of the Administrator appropriation provides support for nearly all Federal NNSA employees in Headquarters and the field elements, and has no subprograms.

This overview will describe Strategic Context, Mission, Benefits, Strategic Goals, and Funding by General Goal. These items together put the appropriation in perspective. It will also address the Program Assessment Rating Tool (PART) assessments for NNSA subprograms, and Significant Program Shifts.

Strategic Context

Following publication of the Administration's National Energy Policy, the Department developed a Strategic Plan that defines its mission, four strategic goals for accomplishing that mission, and seven general goals to support the strategic goals. Each organization has developed program goals and quantifiable annual targets to support the goals. Thus, the "goal cascade" for NNSA is as follows:

Department Mission → Strategic Goal (25 years) → General Goal (10-15 years) → Program Goal (5-10 years)

The goal cascade links major activities for each NNSA program to successive goals, and ultimately to DOE's mission. This helps ensure that the Department focuses its resources on fulfilling its mission. The cascade also facilitates linkage of resources to the goals in the budget request, and is used as the framework for reporting progress against performance metrics. Thus, the cascade approach facilitates integration of budget and performance information support of the Government Performance and Results Act (GPRA) and the President's Management Agenda. A diagram showing the linkages of NNSA's goals, programs, subprograms and activities is included at the end of this section.

To provide a concrete link between budget, performance and reporting, the Department developed a "GPRA Unit" concept, with an associated numbering scheme for DOE-wide integration of program goals and for tracking performance reporting. Within DOE and NNSA, a GPRA Unit defines a major activity or group of activities that support the core mission and align resources with goals. Each NNSA GPRA Unit completes a Program Assessment Rating Tool (PART) self-assessment annually as part of NNSA's Planning, Programming Budgeting and Evaluation (PPBE) process. In addition, to date 7 NNSA GPRA Units have completed PARTs for OMB Review.

Mission

The mission of the National Nuclear Security Administration (NNSA) is to strengthen United States' security through the military application of nuclear energy and by reducing the global threat from terrorism and weapons of mass destruction.

Program Benefits

As the post-Cold War era evolves, the NNSA is managing the Nation's nuclear weapons and ensuring that they are capable of responding to the challenges of the 21st century security environment. The DOE, through the NNSA, works to assure that the nation's nuclear stockpile remains safe, secure, reliable, and ready, and to extend the life of that stockpile in support of Department of Defense (DoD) military requirements. Our nation will continue to benefit from the security that results from an effective nuclear deterrent, with confidence that our nation is ready and prepared to respond rapidly and effectively if required.

Stockpile stewardship activities are carried out without the use of underground nuclear testing, continuing the moratorium initiated by the U.S. in the early 1990's. The NNSA maintains a robust infrastructure of people, programs, and facilities to provide specialized scientific and technical capability for stewardship of the nuclear weapons stockpile. The NNSA also works in partnership with the Department of Defense (DoD) to meet their needs for reliable and militarily effective nuclear propulsion for the U.S. Navy.

The nation continues to benefit from advances in science, technology and engineering fostered by the national security program activities, including cutting edge research and development carried out in partnership with many of the Nation's colleges, universities, small businesses and minority educational institutions. The NNSA programs, including three national laboratories, the Nevada Test Site, and research, development and production facilities across the U.S. employ nearly 2,400 Federal employees and approximately 35,000 contractor employees to carry out this work.

In June 2002, the United States championed a new, comprehensive nonproliferation effort known as the Global Partnership. World leaders committed to raise up to $20 billion over 10 years to fund nonproliferation programs in the former Soviet Union. The NNSA contributes directly to this effort by carrying out programs with the international community to reduce and prevent the proliferation of nuclear weapons, materials and expertise. The security of our nation and the world are enhanced by NNSA's ongoing work to provide security upgrades for military and civilian nuclear sites and enhanced border security in Russia and the Former Soviet Union. We are reducing the world's stocks of dangerous materials such as plutonium through NNSA-sponsored Fissile Materials Disposition programs in the U.S. and Russia as well as through elimination of Russian plutonium production.

The Nation benefits from NNSA's work in partnership with the Department of Homeland Security to develop and demonstrate new detection technologies to improve security of our cities and ports. Perhaps the most tangible benefits to the Nation following the 9/11 terrorist attacks are the "first responder teams" of highly specialized scientists and technical personnel from the NNSA sites who are deployed across the nation to address threats of weapons of mass destruction. These teams work under the direction of the Department of Homeland Security and the Federal Bureau of Investigation to respond to nuclear emergencies in the U. S. and around the world. The teams adapt to changing technologies and evolving challenges associated with combating terrorism and accident/incident scenarios in today's world. Outstanding performance in training, exercises, and real world events continues to justify NNSA's reputation as the one of the world's premier nuclear and radiological technical emergency response capabilities.

Strategic Goal

The Department's Strategic Plan identifies four strategic goals – one each for defense, energy, science and environmental aspects of the mission -- plus seven general goals that link to the strategic goals. All of the NNSA mission is encompassed under the Defense Strategic goal:

To protect our national security by applying advanced science and nuclear technology to the Nation’s defense.

NNSA’s organization, appropriation structure and programs support the following three General Goals:

General Goal 1, Nuclear Weapons Stewardship: Ensure that our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security, and reliability of the U. S. nuclear weapons stockpile.

General Goal 2, Nuclear Nonproliferation: Provide technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance the technologies to detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons.

General Goal 3, Naval Reactors: Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operation.

Contribution to General Goal 1
All NNSA activities funded by the Weapons Activities appropriation/program contribute to General Goal 1. These programs provide personnel and facilities and support for research, development and production activities associated with maintaining the enduring nuclear weapons stockpile. The activities are conducted at a nationwide network of government-owned, contractor operated laboratories, testing facilities and production plants that are maintained and recapitalized by the Federal government, and staffed by a highly specialized and trained scientific/technical workforce to assure a robust infrastructure supporting the U.S. nuclear deterrent.

The Weapons Activities program also supports General Goal 1 with national assets for transportation of weapons, weapon components and materials, national nuclear emergency response assets, and activities to assure safeguards and security for all NNSA facilities, including cyber security.

Contribution to General Goal 2
All NNSA activities funded by the Defense Nuclear Nonproliferation appropriation/program contribute to General Goal 2. The nonproliferation programs address the full dimension of the threat of weapons of mass destruction proliferation, and achieve the desired controls through enhanced detection capabilities, protecting or eliminating weapons and weapons-usable materials, infrastructure and expertise, and by reducing the risk of accidents in nuclear fuel cycle facilities worldwide.

The United States is participating with the world community in a comprehensive ten year nonproliferation effort known as the Global Partnership. The United States intends to provide half of the total $20 billion committed to fund nonproliferation programs in the Former Soviet Union through the DOE, DoD and Department of State. DOE and NNSA are providing almost half of the U. S. funding.

Contribution to General Goal 3

All NNSA activities funded by the Naval Reactors appropriation/program contribute to General Goal 3. Naval Reactors is responsible for all Naval nuclear propulsion work, beginning with technology development, and continuing through reactor operation, and ultimately, reactor plant disposal. The program ensures the safe operation of reactor plants in operating nuclear powered submarines and aircraft carriers (constituting 40 percent of the Navy's combatants), and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements.

Funding by General Goal

(dollars in millions)

	FY 2003	FY 2004	FY 2005	$ Change	% Change	FY 2006	FY 2007	FY 2008	FY 2009
General Goal 1, Nuclear Weapons Stewardship									
Directed Stockpile Work.....	1,259	1,327	1,406	+ 79	+ 6.0%	1,521	1,648	1,778	1,812
Science Campaign.............	261	274	301	+ 27	+ 9.9%	301	308	328	341
Engineering Campaign.............	271	265	243	- 22	- 8.3%	268	226	284	237
ICF and High Yield Campaign...	499	514	492	- 22	- 4.3%	521	535	437	441
Advanced Simulation and Computing Campaign.............	674	721	741	+ 20	+ 2.8%	782	826	834	848
Pit Manufacturing and Certification Campaign.............	262	297	336	+ 39	+ 13.1%	324	314	155	158
Readiness Campaign.............	270	329	280	-49	-14.9%	331	307	357	376
Readiness in Technical Base and Facilities........	1,481	1,541	1,474	- 67	- 4.3%	1,600	1,753	1,839	1,916
Nuclear Weapons Incident Response.............	81	89	99	+ 10	+ 11.2%	100	101	98	101

	FY 2003	FY 2004	FY 2005	$ Change	% Change	FY 2006	FY 2007	FY 2008	FY 2009
Secure Transportation Asset	169	161	201	+ 40	+ 24.8%	185	186	190	195
Facilities and Infrastructure Recapitalization Program	235	239	316	+ 77	+ 32.2%	373	426	472	476
Safeguards and Security	529	553	677	+ 124	+ 22.4%	575	586	580	591
Office of the Administrator	279	283	277	- 6	- 2.1%	282	288	293	299
Use of PY Balances	-30	-77	0	0	0%	0	0	0	0
Total Goal 1, Nuclear Weapons Stewardship	6,237	6,513	6,845	+ 332	+ 5.1%	7,163	7,504	7,646	7,791
General Goal 2, Control of Weapons of Mass Destruction									
Nonproliferation and Verification Research & Development	256	232	220	- 12	- 5.2%	229	235	246	248
Nonproliferation and International Security	131	114	124	+ 10	+ 8.8%	119	120	120	120
International Nuclear Material Protection and Cooperation	333	258	238	- 20	- 7.8%	244	250	258	260
Russian Transition Initiative	39	40	41	+ 1	+ 2.5%	42	43	43	44
HEU Transparency Implementation	17	18	21	+ 3	+ 16.7%	21	21	20	20
International Nuclear Safety	34	0	0	0	0	0	0	0	0
Elimination of Weapons-Grade Plutonium Production	49	65	50	-15	-23.1%	56	59	60	67

	FY 2003	FY 2004	FY 2005	$ Change	% Change	FY 2006	FY 2007	FY 2008	FY 2009
Accelerated Materials Disposition	1	0	0	0	0	0	0	0	0
Fissile Materials Disposition	382	653	649	- 4	- 0.6%	661	673	685	697
Offsite Source Recovery Project	2	2	6	+ 4	+ 200.0%	9	9	9	9
Office of the Administrator.......	54	57	57	0	0	58	59	60	61
Use of PY Balances	- 20	- 48	0			0	0	0	0
Total Goal 2, Control of Weapons of Mass Destruction	1,278	1,391	1,406	+ 15	+ 1.0%	1,439	1,469	1,501	1,526
Goal 3, Defense Nuclear Power (Naval Reactors)........	702	762	798	+ 36	+ 4.7%	803	818	834	850
Total, NNSA	8,217	8,667	9,049	+ 382	+ 4.4%	9,405	9,791	9,981	10,167

NNSA Program Direction expenditures funded in the Office of the Administrator appropriation have been allocated in support of Goals 1 and 2. Goal 1 allocation includes Federal support for programs funded by the Weapons Activities appropriation, as well as NNSA corporate support, including Federal staffing at the site offices. Goal 2 allocation includes Federal support for all Nuclear Nonproliferation programs. Program Direction expenditures for Naval Reactors, supporting Goal 3, are funded within the Naval Reactors appropriation.

Program Analysis Rating Tool (PART)

The PART was developed by the Office of Management and Budget to provide a standardized way to assess the effectiveness of the Federal government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities in terms of planning, management and results. The PART process links seamlessly with NNSA's new PPBE concept, and we have initiated PART "self-assessments" for all NNSA programs as a prominent aspect of the annual program review cycle.

The current focus is to establish outcome- and output-oriented goals, which when successfully completed will lead to benefits to the public, such as increased national security, energy security, and improved environmental conditions. NNSA has incorporated the results and recommendations from these reviews into the decision making processes for this budget, and continues to take steps to improve performance.

The Office of Management and Budget (OMB) conducted PART reviews for three NNSA programs in conjunction with the FY 2005 budget. NNSA has received ratings of "Moderately Effective" for two programs (Inertial Confinement Fusion and High Yield Campaign/NIF (ICF) and Readiness in Technical Base and Facilities – Operations (RTBF)) and "Results Not Demonstrated" for the Elimination of Weapons Grade Plutonium Production (EWGPP) program, a new activity transferred to NNSA from DoD in FY 2003. Each of the programs scored strongly in the Purpose, Planning and Management assessments. Lower scores in the "results and accountability" section reflect the need for improvement in performance metrics for the ICF and RTBF programs. Since the EWGPP program is brand new, no major deliverables are planned until FY 2004. Details of the assessments and the recommendations will be discussed in the individual subprogram justifications.

For the FY 2004 budget, OMB rated four NNSA programs: two programs as "Effective", the Advanced Simulations and Computing Campaign (ACSI) and the International Nuclear Materials Protection and Cooperation Program (MPC&A); one program as "Moderately Effective", Facilities and Infrastructure Recapitalization Program (FIRP); and one program as "Adequate", Safeguards and Security. ASCI, MPC&A and FIRP were given very high marks for program purpose and performance measurement data. FIRP scored Moderately Effective because it was a new program and therefore had not had time to achieve results. The Safeguards and Security program was praised by OMB for providing one of the most secure sets of facilities in the country. However, OMB found the program did not clearly define its performance measures (goals and targets), which resulted in the overall rating of Adequate.

All findings from last year's assessments have been addressed. OMB has acknowledged improvement in Safeguards and Security's performance measures, and OMB plans to reassess this program next year.

Significant Program Shifts

The FY 2005-2009 budget proposal contains several significant shifts in program effort from the FY 2004 President's Budget Request.

Within Weapons Activities, the budget structure has been changed in response to Congressional concerns to align Directed Stockpile Work funding with individual weapon systems, and to highlight Nuclear Weapon Incident Response as a separate line. Funding has also been rebalanced to support research and development on advanced weapon concepts to meet emerging DoD requirements that will enhance the nuclear deterrent, and to ensure a robust and capable NNSA for the future. This shift includes funding allocated to the Robust Nuclear Earth Penetrator feasibility and cost studies in response to a request from the U.S. Strategic Command approved by the Nuclear Weapons Council in November 2001. Also within the Weapons Activities appropriation, FY 2005 funding is requested to address revised threat guidance at NNSA sites. The "Design Basis Threat" (DBT) implementation requires upgrades to equipment, personnel and facilities to enhance security throughout the nationwide nuclear weapons complex. Outyear funding estimates for DBT implementation will be developed as part of the FY 2006-2010 Programming process.

In the Defense Nuclear Nonproliferation program, the Russian reactor safety efforts under the International Nuclear Safety program were completed successfully in 2003. The remaining $4 million for emergency management and cooperation efforts was shifted to the Nonproliferation and International Security program. These funds provide for the orderly shutdown of the BN 350 reactor in Kazakhstan ($1.5 million) and continue activities to strengthen international emergency cooperation and communications ($2.5 million). The Accelerated Materials Disposition initiative was not supported by Congress in FY2004 and in consideration of overall NNSA priorities, is not requested in the FY2005 budget or outyears.

NNSA has assumed responsibility for the Offsite Source Recovery Project from the Office of Environmental Management. This program recovers excess and unwanted sealed sources from non-DOE sites, and places them in storage at DOE facilities to reduce the risk of their possible use in a radiological dispersal device. The program will be funded within the Defense Nuclear Nonproliferation appropriation, at a projected cost of about $40 million through the FYNSP period.

Institutional General Plant Projects (IGPP)

Institutional General Plant Projects (IGPP) provides funding for minor new construction of a general institutional nature at multi-program sites. The cost of IGPP projects is less than $5 million, and projects benefit multiple cost objectives. IGPP's do not include projects whose benefit can be directly attributed to a specific or single program. The following table reflects current site planned IGPP targets as of the latest Ten Year Comprehensive Site Plan.

Site IGPP Estimates

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Los Alamos National Laboratory...	5.2	9.5	10.0	+0.5	+5%
Livermore National Laboratory......	4.2	9.5	9.7	+0.2	+2%
Sandia National Laboratory	12.3	10.7	4.9	-5.8	-54%
Nevada..	0	5.0	5.0	--	--
Total Site IGPP	21.7	34.7	29.6	-5.1	-15%

Funding Summary by Site

(dollars in millions)

	FY 2003	FY 2004	FY05 Office of the Admin	FY05 Weapon Activities	FY05 Nuclear Nonprolif	FY05 Naval React	Total FY 2005
Chicago Operations Office							
Ames Laboratory	0.2	0.2			0.2		0.2
Argonne Nat. Laboratory	24.7	19.2		1.9	20.5		22.4
Brookhaven National Laboratory	25.4	44.5		1.6	33.3		34.9
Chicago Operations Office	209.5	428.4		25.2	446.3		471.5
New Brunswick Laboratory	1.5	1.1			1.1		1.1
Idaho Operations Office							
Idaho National Laboratory	59.5	58.0			2.0	56.0	58.0
Idaho Operations Office	1.4	1.1		1.4			1.4
Kansas City Site Office							
Kansas City Plant	390.3	403.8		378.0	1.4		379.5
Kansas City Site Office	6.2	6.2	6.0				6.0
Livermore Site Office							
Lawrence Livermore National Laboratory	1,048.7	1,004.1		963.3	70.4		1,033.7
Livermore Site Office	12.8	16.1	16.5				16.5
Los Alamos Site Office							
Los Alamos National Laboratory	1,410.0	1,415.6		1,395.6	123.6		1,519.2
Los Alamos Site Office	12.0	14.6	15.9				15.9
National Engineering Technology Laboratory	1.7	0.0					0.0
NNSA Service Center							
Atomic Energy of Canada, Ltd.	2.4	1.2			1.2		1.2
General Atomics	10.8	11.0		13.1	0.2		13.3

	FY 2003	FY 2004	FY05 Office of the Admin	FY05 Weapon Activities	FY05 Nuclear Nonprolif	FY05 Naval React	Total FY 2005
Lawrence Berkeley National Laboratory............................	5.2	4.0			4.1		4.1
Naval Research Laboratory..	22.3	13.3		11.0			11.0
NNSA Service Center (all other sites)............................	487.8	467.2	98.7	232.2	83.4		414.4
Nonproliferation and National Security Institute.....	0.1						
University of Rochester/LLE.	46.8	62.6		45.5			45.5
Nevada Site Office							
Nevada Site Office................	104.1	92.5	17.5	45.7	7.4		70.6
Nevada Test Site	247.7	285.4		282.9	1.0		283.9
Oak Ridge Operations Office							
Oak Ridge Institute for Science and Engineering......	7.8	8.8		7.1			7.1
Oak Ridge National Laboratory............................	110.6	95.8		7.5	136.9		144.4
Office of Science and Technical Information	0.1	0.1		0.1			0.1
Y-12 Site Office....................	9.6	16.3	11.7				11.7
Y-12 National Security Complex...............................	734.3	728.2		727.0	61.0		788.0
Pantex Site Office							
Pantex Plant	413.0	431.1		463.5	10.3		473.8
Pantex Site Office.................	9.9	10.8	11.6				11.6
Pittsburgh Naval Reactors Office							
Bettis Atomic Power Laboratory............................	351.6	396.2				401.2	401.2
Pittsburgh Naval Reactors Office	7.8	8.2				8.7	8.7
Richland Operations Office							
Richland Operations Office...	0.4	0.8		1.3			1.3

	FY 2003	FY 2004	FY05 Office of the Admin	FY05 Weapon Activities	FY05 Nuclear Nonprolif	FY05 Naval React	Total FY 2005
Pacific Northwest National Laboratory............................	132.5	85.6		4.4	70.1		74.5
Sandia Site Office							
Sandia National Laboratories	1,306.8	1,376.7		1,167.7	144.3		1,312.0
Sandia Site Office.................	8.6	12.1	12.5				12.5
Savannah River Operations Office							
Savannah River Operations Office	14.0	26.5			32.4		32.4
Savannah River Site Office ..	3.5	3.1	2.9				2.9
Savannah River Site.............	305.3	303.3		238.9	55.5		294.4
Schenectady Naval Reactors Office							
Knolls Atomic Power Laboratory............................	269.5	282.0				308.2	308.2
Schenectady Naval Reactors Office	6.3	6.7				7.0	7.0
Washington DC Headquarters	501.3	688.2	137.9	577.5	41.9	13.8	771.1
Other.......................................	5.7	7.0	2.4			3.0	5.4
Subtotal, NNSA	8,360.4	8,842.0	333.7	6,598.5	1,348.6	768.4	9,078.7
Adjustments............................	- 143.5	- 176.2	0.0	- 30.0	0.0	0.0	- 30.0
Total, NNSA..........................	8,216.9	8,665.8	333.7	6,568.5	1,348.6	768.4	9,048.7

DOE/NNSA Goal Cascade

Shaded Areas indicate NNSA Budget Justification levels

BUDGET DOCUMENT	OVERVIEW	PROGRAM	SUBPROGRAM	ACTIVITY
DOE Goal Cascade	*DOE Strategic Goal*	*DOE General Goals*	*DOE Program Goals (goal number)*	
NNSA Cascade	NNSA, Defense Strategic Goal	Weapons Activities, General Goal 1, Nuclear Weapons Stewardship	Directed Stockpile Work (01.27.00.00)	by weapon system
			Science Campaign (01.28.00.00)	by campaign
			Engineering Campaign (01.29.00.00)	by campaign and construction project
			Readiness Campaign (01.33.00.00)	by campaign
			Inertial Confinement Fusion and High Yield/NIF Campaign (01.30.00.00)	
			Advanced Simulation And Computing Campaign (01.31.00.00)	
			Pit Manufacturing and Certification Campaign (01.32.00.00)	
			Readiness in Technical Base and Facilities (01.34.00.00 O&M, 01.35.00.00 Construction)	by activity and construction project
			Nuclear Weapon Incident Response (01.37.00.00)	
			Secure Transportation Asset (01.36.00.00)	
			Facilities and Infrastructure Recapitalization (01.38.00.00)	
			Safeguards and Security (01.39.00.00)	
		Defense Nuclear Nonproliferation, General Goal 2, Nuclear Nonproliferation	Research and Development (02.40.00.00)	
			HEU Transparency (02.41.00.00)	
			Elimination of Weapons Grade Plutonium Production (02.42.00.00)	
			Nonproliferation and International Security (02.44.00.00)	
			Russian Transition Initiatives (02.45.00.00)	
			Int'l Materials Protection and Cooperation (02.46.00.00)	
			Fissile Materials Disposition (02.47.00.00)	
			Off-Site Source Reduction (02.62.00.00)	
		Naval Reactors, General Goal 3, Naval Reactors (03.49.00.00)	No subprograms	
		Office of the Administrator Supports General Goals 1 and 2 (01,02.50.00.00)	No subprograms	

Office of the Administrator

Office of the Administrator

Office of the Administrator

Proposed Appropriation Language

For necessary expenses of the Office of the Administrator in the National Nuclear Security Administration, including official reception and representation expenses (not to exceed $12,000), [$336,826,000] *$333,700,000*, to remain available until expended.

Explanation of Change

The only change from FY 2004 is the proposed funding amount.

Office of the Administrator
Overview

Funding Schedule by Appropriation
(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Original Appropriation	FY 2004 Adjustments	FY 2004 Comparable Appropriation	FY 2005 Request
Office of the Administrator Program Direction	330,314[a]	339,980	- 3,154[b]	336,826[c]	333,700

Public Law Authorization:
P.L. 108-136, National Defense Authorization Act, FY 2004
P.L. 108-137, Energy and Water Development Appropriations Act, FY 2004

FYNSP Schedule
(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Office of the Administrator...........	333,700	339,700	346,700	352,700	359,700	1,732,500

FY 2003 Execution
(dollars in thousands)

	FY 2003 Appropriation	Homeland Security Transfer	Rescission	Reprogram-ming	Comp Adjustment	FY 2003 Comparable
Office of the Administrator...........	330,929	- 2,911	- 2,151	9,125	-4,678[d]	330,314[a]

FY 2004 Appropriation
(dollars in thousands)

	FY 2004 Enacted Appropriation	Use of Prior Year Balances	Pending Rescission	Reprogram/ Transfers	Comp Adjustments	Current FY 2004 Comparable
Office of the Administrator...........	339,980	0	- 2,006	0	- 1,148	336,826[bc]

[a] The FY 2003 program level for the Office of the Administrator was $5,639,796 higher than the new budget authority reflected in this table, achieved through the planned use of prior year unobligated balances.

[b] Reflects the pending 0.59% rescission of $2,006,000, the transfer of $1,100,000 to the Office of Science, $300,000 to the Office of Nuclear Energy, and $252,000 from the Office of Environmental Management.

[c] The FY 2004 program level for the Office of the Administrator will be achieved through the planned use of prior year unobligated balances in the amount of $10,543,164. These balances are available from FY 2002 and earlier years. Re-engineering activities, primarily Permanent Change of Station (PCS) moves, will be funded through the use of these funds.

[d] Reflects the transfer of $4,014,000 to the Office of Security Operations, $1,050,000 to the Office of Science, and $370,000 to the Office of Nuclear Energy; also reflects the transfer of $511,000 from the Office of Security Operations and $245,000 from the Office of Environmental Management.

Mission

The Office of the Administrator creates a well-managed, inclusive, responsive, and accountable organization through the strategic management of human capital; enhanced cost-effective utilization of information technology; and greater integration of budget and performance data.

Benefits

The Office of the Administrator appropriation supported 2,003 onboard Federal personnel nationwide at the end of FY 2002. By the end of FY 2004, that number will be reduced to 1,705 onboard personnel (a decrease of 298 or 14.9 percent from the end of FY 2002). The Office of the Administrator provides the Federal personnel and resources necessary to plan, manage, and oversee the operation of the National Nuclear Security Administration (NNSA). The Nation benefits from having a highly educated and skilled cadre of Federal managers overseeing the operations of the defense mission activities and performing many specialized duties including leading Emergency Response teams and safeguards and security oversight. The nation also benefits from the recent Re-engineering of the NNSA Federal organizations and staff that demonstrated that the staff deployment is regularly assessed against current and future program needs, tough program management standards in the Program Assessment Rating Tool (PART), and for the most efficient and cost effective deployment of Federally-funded management resources.

Program and Strategic Goals

The Office of the Administrator appropriation supports the following goals:

Defense Strategic Goal: To protect our national security by applying advanced science and nuclear technology to the Nation's defense.

General Goal 1, Nuclear Weapons Stewardship: Ensure that our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security, and reliability of the U.S. nuclear weapons stockpile.

General Goal 2, Nuclear Nonproliferation: Provide technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance the technologies to detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons.

Contribution to General Goals 1 and 2

The Office of the Administrator (program goal 01,02.50.00.00), contributes to General Goals 1 and 2 by providing the Federal personnel and resources necessary to plan, manage, and oversee the operation of the National Nuclear Security Administration's programs designed to meet these goals.

The Office of the Administrator appropriation has one program goal that contributes to General Goals 1 and 2 in the "goal cascade." This goal is:

Create a well-managed, inclusive, responsive, and accountable organization through the strategic management of human capital; enhanced cost-effective utilization of information technology; and greater integration of budget and performance data.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Number of NNSA Federal employees (Efficiency measure)	1,768 Federal employees (down from 2,003)	1,705 Federal employees (down from 1,768)	1,705 Federal employees	1,705 Federal employees	1,705 Federal employees	1,705 Federal employees	1,705 Federal employees	FY 2004
Annual NNSA Employment Efficiency Index to measure effectiveness in filling needed positions in accordance with approved Managed Staffing Plans (Efficiency Measure)	Completed workforce plans and staffing targets	72 percent (new baseline)	80 percent	85 percent	90 percent	90 percent	90 percent	FY 2007
Average NNSA Program score on the OMB PART assessment indicating progress in budget performance integration and results (Efficiency measure)	No previous target	70 percent	75 percent	80 percent	85 percent	85 percent	85 percent	FY 2007
Percentage of NNSA Employees who are aware that they can take a leadership role in fostering a diverse and inclusive workplace	No previous target	Develop NNSA's diversity metrics and baseline	60 percent	70 percent	80 percent	90 percent	100 percent	FY 2009
Number of procurement actions awarded as a result of NNSA's Strategic Sourcing Initiative	Defined NNSA's Strategic Sourcing Initiative	Award three contracts at a minimum cost savings of ten percent	Award four contracts at an additional cost savings of ten percent	Award three contracts at an additional cost savings of ten percent	Award two contracts at an additional cost savings of ten percent	Award two contracts at an additional cost savings of ten percent	Award two contracts at an additional cost savings of ten percent	On-going
Percentage of NNSA federal offices consolidated to the NNSA Information Technology (IT) Common Environment/Service Center[a]	NNSA Federal sites integrated to a single IT Enterprise Service Level Agreement	Baseline and initiate NNSA IT Service Center Stand-up and Common Environment project	75 percent	100 percent	Target completed	Target completed	Target completed	FY 2006

[a] NOTE: Annual cost savings (gross) of $11M against an operating baseline of $34M will be achieved through a rationalized and modernized architecture resulting in reduced requirements for contractor support, equipment replacement and maintenance, and software procurement and licensing (E-gov/Efficiency measure)

Means and Strategies

The Office of the Administrator program will use various means and strategies to achieve its goals. However, various external factors may impact the Office of the Administrator's ability to achieve these goals. The program also performs collaborative activities to help meet its goals. The NNSA is adopting a number of enhanced business systems to make sure that we are excellent stewards of U.S. national nuclear security matters. We are implementing a disciplined planning, programming, and budgeting process to assure taxpayers that these programs are integrated and cost effective. We are adopting information and acquisition management tools and practices to do our job better and more efficiently. We will use creative personnel practices to ensure the best talent is recruited, retained, and rewarded, and all employees are accountable to the NNSA Administrator for performance in achieving their elements of the NNSA's mission. As we continue standing up the new NNSA organization, we are reducing management layers and improving reporting relationships. The Re-engineering concept that has been developed jointly by managers throughout the organization is redeploying technical staff where the work is performed, and centralizing common business and administrative functions to improve the quality of oversight and increase efficiency. Congressional support of excepted service authority to cover all of NNSA's 850 engineering and scientific positions is crucial to providing the highest quality technical managers in the NNSA; and implementation of Planning, Programming, Budgeting, and Evaluation (PPBE), as the core business practice, will facilitate linkage of program performance with managerial appraisals.

Validation and Verification

To validate and verify program performance, NNSA will conduct various internal and external reviews and audits. NNSA's programmatic activities are subject to continuing review by the Congress, the General Accounting Office, the Department's Inspector General, the National Security Council, the Defense Nuclear Facilities Safety Board, the Department's Office of Engineering and Construction Management, and the Department's Office of Independent Oversight and Performance Assurance. Each year numerous external independent reviews are conducted of selected projects. Additionally, NNSA Headquarters senior management and field managers conduct frequent, in-depth reviews of cost, schedule, and scope to ensure projects are on-track and within budget.

NNSA has established a comprehensive validation and verification process as part of its Planning, Programming, Budgeting and Evaluation (PPBE) system. Long-term performance goals are established/validated during the Planning Phase and linked in a performance cascade to annual targets and detailed technical milestones. During the Programming Phase, budget and resources trade-offs and decisions are evaluated based on the impact to annual and long-term performance measures. These NNSA decisions are documented and used to develop the budget requests during the Budgeting Phase. Program and financial performance for each measure is monitored and progress verified during the Execution and Evaluation Phase.

NNSA validation and verification activities during the PPBE Execution and Evaluation phase include a set of tiered performance reviews to examine everything from detailed technical progress to program management controls to corporate performance against long-term goals. This set of reviews includes: (1) the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART); (2) NNSA Administrator Program Reviews; (3) Program Managers Detailed Technical Reviews; (4) quarterly reporting of progress through the Department's JOULE performance tracking system; and (5) the NNSA Administrator's Annual Performance Report.

The NNSA Administrator reviews each NNSA program at least annually during the NNSA Administrator Reviews. These reviews involve all members of the NNSA management council to ensure progress and recommendations are fully integrated for corporate improvement. The focus of these reviews is to verify and validate that NNSA programs are on track to meet their long-term goals and annual targets.

The program managers conduct a second more detailed review of each program. These Program Manager Detailed Technical Reviews are normally held at least quarterly during the year. The focus of these reviews is to verify and validate that NNSA contractors are achieving detailed technical milestones that result in progress towards annual targets and long-term goals. These two reviews work together to ensure that advanced warnings are given to NNSA managers in order for corrective actions to be implemented.

The results of all of these reviews are reported quarterly in the Department's JOULE performance tracking system and annually in the NNSA Administrator's Annual Performance Report and the DOE Performance Accountability Report (PAR). Both documents help to measure the progress NNSA programs are making toward achieving annual targets and long-term goals. These documents are summary level to help senior managers verify and validate progress toward NNSA and Departmental commitments listed in the budget.

In addition, NNSA programs are independently reviewed. These independent reviews are conducted by the General Accounting Office, Inspector General, National Security Council, Foster Panel, Defense Nuclear Safety Board, Secretary of Energy Advisory Board, and others. Recent Inspector General and General Accounting Office reports on the Office of the Administrator include PPBE Process and Structure (A02AL048) and Review of NNSA's Management Structure (360337).

Program Assessment Rating Tool (PART)

NNSA is using the OMB PART process to perform annual internal self-assessments of the management strengths and weaknesses of each NNSA program. Among other things, the PART process helps NNSA ensure that quality, clarity, and completeness of its performance data and results are in accordance with standards set in the Government Performance and Results Act of 1993 and reinforced by the President's Management Agenda. Independent PART assessments conducted by OMB provide additional recommendations to strengthen NNSA programs.

The Office of Management and Budget will not conduct a PART review on the Office of the Administrator program. NNSA's self assessment of the Office of the Administrator's PART status was completed in the first quarter of FY 2004 and resulted in the program receiving a rating of 84 percent (Moderately Effective).

Steps to create the NNSA of the Future

FY 2003

- Finalized managed staffing plans for each Headquarters element, the NNSA Service Center, and each Site Office.
- Reduced Federal staffing by 235 positions.
- Implemented Planning, Programming, Budgeting, and Evaluation (PPBE), Business Operating Procedure.

- Finalized approach to support service contracts by consolidating multiple contracts to one administrative and one technical contract.

- Provided Diversity Leadership Training for about 1,200 NNSA supervisory and non-supervisory employees (GS13 and above: 6 two-hour modules each).

- Implemented corporate Information Technology (IT) investment decision making, completed initial planning for NNSA Federal Sector Common IT Environment.

FY 2004

- Voluntary separation incentives used in the first quarter of FY 2004 to accelerate office closings and support voluntary attrition (67 employees took a buyout).

- NNSA Performance Management and Recognition Program being implemented to move all sites to a single system for assessing and awarding employee performance consistent with the President's Management Agenda.

- Oakland Federal building being vacated by September 30, 2004, resulting in a savings of approximately $3.3 million annually.

Significant Program Shifts in FY 2005

- The FY 2005 budget transfers $1,150,000 and 10 Full Time Equivalents, or FTE's to the Office of Science for functions previously supported by the Oakland Operations Office.

- The FY 2005 budget transfers $300,000 and one FTE to the Office of Nuclear Energy for the Nuclear Energy Agency (NEA) function in Paris.

- The FY 2005 budget request also reflects a transfer from the Office of Environmental Management of $266,000 and 2 FTEs to the NNSA for support of the Off-Site Source Recovery Program at the Los Alamos National Laboratory.

- Funding to support the Department's A-76 studies have been provided by NNSA Program Direction through FY 2003, no funds have been requested in FY 2004 or FY 2005 for follow-on efforts. To the extent A-76 savings are realized in FY 2004, consideration should be given to those staffing reductions already absorbed by NNSA through the Re-engineering of our Federal Staff to avoid creating future funding shortfalls by counting those reductions twice. Federal manpower eliminated by Re-engineering has already been reflected in the funding estimates included in the FY 2005 Congressional Budget Request.

- The Weapons Activities, Defense Nuclear Nonproliferation, and Office of the Administrator appropriations in FY 2003 provided funding for Defense Contract Audit Agency (DCAA) assessments. In FY 2004 and beyond, these assessments will be funded consistent with the Department's methodology for allocating costs based on total budget authority. These funds are identified in each appropriation's FY 2005 Congressional Budget Request. The Office of the Administrator will provide $91,459 in FY 2004 and $91,206 in FY 2005. The total NNSA contribution in FY 2004 is $2,151,900 and in FY 2005 the total NNSA contribution is $2,255,100.

During the transition to the NNSA of the future, implementation of Re-engineering initiatives realigning personnel will require that funding estimates be refined periodically. Adjustments as we undergo this ambitious process are unavoidable due to factors beyond management control, such as the pace of retirements. Flexibility is needed, and understanding that our efforts are a work in progress. An example of the type of flexibility requiring adjustments in funding estimates is the area of Permanent Change of Station (PCS) moves (which cost $100,000 on average); until we know how many people choose to either accept a directed reassignment or leave NNSA instead of relocating, we will be unable to know exactly the number of people requiring PCS funding versus hiring new people at the receiving personnel locations. NNSA has chosen to provide staff sufficient time to make important personal career decisions; this “humane” aspect of the process has delayed absolute estimates for employee relocation.

NNSA managers have finalized the managed staffing plans and the NNSA planning process is on target. NNSA began reassigning staff to support critical needs during the first quarter of FY 2004 and we are slightly ahead of our first quarter projections for FY 2004. The pace of both voluntary and directed reassignments is governed by funding availability. Our goal is to complete all reassignments by the end of FY 2004 with any remaining funding requirements for PCS moves completed early in FY 2005.

The enacted appropriations for both FY 2003 and FY 2004 contained funding earmarks for Defense Nuclear Nonproliferation within the Office of the Administrator. This budget submission fully funds projected hiring and on-board staffing in Defense Nuclear Nonproliferation up to 251 Federal employees by the end of FY 2004. However, NNSA does not support continued “fencing” of these funds as it limits the Administrator’s flexibility in adjusting priorities as required.

The Office of the Administrator budget is comprised of approximately 65 percent Salaries and Benefits for NNSA Federal staff. The remaining 35 percent includes several major efforts with largely fixed costs in the areas of Information Technology, Working Capital Fund, and support for the International Offices. This leaves a relatively small percentage of truly discretionary spending in the areas of Travel, Training, and Support Services.

Re-engineering Progress
FTE and Staffing Levels
FY 2002 – FY 2005

	FY 2002 Actual End of Year Headcount	FY 2003 Actual FTEs 1/	FY 2003 Actual End of Year Headcount	FY 2004 Projected FTEs 2/	FY 2004 Projected End of Year Headcount	FY 2005 Projected FTEs	FY 2005 Projected End of Year Headcount
Office of the Administrator							
NNSA staff subject to Re-engineering							
Headquarters	458	390	365	344	315	315	315
NNSA Service Center	679	631	565	525	475	475	475
Livermore Site Office	82	83	90	90	91	91	91
Los Alamos Site Office	75	77	87	98	103	103	103
Sandia Site Office	63	63	83	87	89	89	89
Nevada Site Office	136	114	96	96	92	92	92
Pantex Site Office	75	74	70	77	82	82	82
Y-12 Site Office	74	73	70	77	81	81	81
Kansas City Site Office	52	52	54	52	50	50	50
Savannah River Site Office	25	24	23	22	20	20	20
Subtotal, Staff subject to Re-engineering	**1,719**	**1,581**	**1,503**	**1,468**	**1,398**	**1,398**	**1,398**
Staff exempt from Re-engineering							
Defense Nuclear Nonproliferation 3/	207	206	219	242	251	251	251
Emergency Operations 4/ 5/	77	42	46	53	56	56	56
Subtotal, Staff exempt from Re-engineering	**284**	**248**	**265**	**295**	**307**	**307**	**307**
TOTAL, Office of the Administrator	**2,003**	**1,829**	**1,768**	**1,763**	**1,705**	**1,705**	**1,705**

1/ FTE usage of 1,862 included 24 FTEs transferred to Security Operations, 10 to Science, 1 to Nuclear Energy and 2 from Environmental Management.
2/ FTE usage of 1,772 included 10 FTEs transferred to Science, 1 to Nuclear Energy and 2 from Environmental Management.
3/ Includes 9 Non-NNSA employees at Chicago.
4/ Includes 2 Non-NNSA employees at Chicago, 1 at Richland, 1 at Idaho, 1 at Savannah River, and 1 at the Oak Ridge National Lab.
5/ Reflects the transfer of 26 FTEs to Security Operations and 7 FTEs to Energy Security and Assurance in FY 2003.

Program Direction

Funding by Site

	(dollars in thousands)		
	FY 2003	**FY 2004**	**FY 2005**
Office of the Administrator			
Headquarters	137,564	140,396	137,937
NNSA Service Center	111,415	102,759	98,701
Livermore Site Office	12,844	16,072	16,489
Los Alamos Site Office	11,964	14,558	15,865
Sandia Site Office	8,635	12,056	12,518
Nevada Site Office	16,026	17,700	17,542
Pantex Site Office	9,944	10,768	11,591
Y-12 Site Office	9,641	10,833	11,674
Kansas City Site Office	6,001	6,159	6,012
Savannah River Site Office	3,548	3,148	2,925
Chicago (Non-NNSA)	2,132	1,849	1,902
Idaho (Non-NNSA)	150	132	136
Richland (Non-NNSA)	150	132	136
Savannah River (Non-NNSA)	150	132	136
Oak Ridge (Non-NNSA)	150	132	136
Total, Office of the Administrator	**330,314**	**336,826**	**333,700**
Total, Full Time Equivalents	1,829	1,763	1,705
Total, End of Year Headcount	1,768	1,705	1,705

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Salaries and Benefits	**211,737**	**217,605**	**212,646**

Provides support for the National Nuclear Security Administration (NNSA) Federal staff (1,705 Full Time Equivalents or FTEs in FY 2005), including annual Cost of Living Adjustments (COLAs), within-grade increases, promotions, severance costs, performance awards, health and retirement benefits, and other compensation adjustments. The request also supports the international offices, including foreign service nationals.

The FY 2005 Congressional Budget Request reflects a cost avoidance of over $37 million realized by the reduction in NNSA Federal staffing levels of 298 positions (payroll would have been $37 million higher in FY 2005 if those staff reductions had not been realized). Payroll is included in this estimate to fully fund projected hiring and on-board staffing in Defense Nuclear Nonproliferation up to 251 Federal employees by the end of FY 2004.

The decrease of $4,959,000 or 2.3 percent from FY 2004 is directly attributable to the reduction in staff (partially offset by the effects of the COLA and escalation). FY 2004 reflects buyouts costs of $4,260,000 and projected attrition savings of $6,847,053.

The salary portion of this budget consumes approximately 80 percent of the estimate, leaving about 20 percent for benefits. A cost of living adjustment of 2 percent is reflected in the salary calculations as of January 2004, and another 1.5 percent is included in the salary estimates as of January 2005. Benefits escalation, particularly the Government's share of health insurance premiums, has proven to be much more costly than average cost of living adjustments (increasing over 10 percent annually in recent years). The Government pays about 70 percent of an employee's health insurance premium.

The January 2004 cost of living adjustment, if enacted at 4.1 percent as proposed in the Conference Report of the FY 2004 Omnibus Appropriation, would cost another $3,080,595 in FY 2004 to implement and add $4,270,291 to FY 2005 payroll calculations.

Travel	**10,776**	**10,007**	**10,007**

Includes domestic and foreign travel necessary to conduct NNSA business. Domestic travel supports management oversight, public outreach, and national security assistance and interface with the Site Offices, the Service Center, Headquarters, the laboratories, and local governments. International travel is increasing with the growth of the NN mission. It is a key element of the nonproliferation work with international agencies and the Former Soviet Union republics.

Increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex.

Support Services.. **34,344** **32,737** **32,737**

Provides Technical Support for highly specialized analytical expertise required to address critical technical program issues in nonproliferation and national security (FY 2005 $21,279,000). Also provides Management Support for studies and review of NNSA corporate policies and procedures concerning management operations and planning (FY 2005 $4,911,000) as well as Administrative Support and other non-technical support such as operation of mailrooms and maintenance of various databases (FY 2005 $6,547,000).

Increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex.

Information Technology also provides $19,419,000 of Automated Data Processing (ADP) Support in FY 2005 (shown in the Other Related Expenses object class in total).

Other Related Expenses.. **73,457** **76,477** **78,310**

Provides all Information Technology support for the NNSA Federal staff, including network services, maintenance and equipment; help desk support; and user equipment and software, including support for Department-wide systems such as the financial information reporting systems. Also included is support for implementation of NNSA's capital planning and acquisition management programs associated with IT investments at NNSA M&O facilities. The Information Technology program for FY 2005 of $34,965,000 is managed on the Plan, Build, and Operate model and budgeted as follows: Plan (including M&O oversight) $2,450,000; Build $11,866,000; and Operate $20,649,000.

Provides for necessary training and skills maintenance of the NNSA Federal staff in FY 2005 of $1,810,000.

Provides the Headquarters working capital fund contribution of $16,224,000 in FY 2005 for NNSA's share of the common Washington infrastructure support charged by the DOE working capital fund (e.g., rents and utilities), as well as procurement of specific NNSA Headquarters infrastructure requirements through the Department (e.g., telephone lines, printing and reproduction, supplies, general office space modifications and construction). Includes working capital fund support for in FY 2005 of $1,293,000 for office moves, office renovation, furniture, and office equipment. Also includes $440,000 for field occupancy costs.

Supports largely fixed Working Capital Fund costs in the field during FY 2005 of $11,999,000 associated with facilities and maintenance; occupancy costs; rental payments; and overall operations and maintenance of both rented and owned Federal space, including utilities, janitorial expenses, telecommunications, and minor construction costs.

Supports Defense Contract Audit Agency (DCAA) audit assessment of $91,206 in FY 2005. The total NNSA contribution in FY 2005 is $2,255,100.

Provides $12,000 for official reception and representation expenses for NNSA activities.

Provides all other activities required to support NNSA's Federal personnel in FY 2005 of $11,475,794. Funding includes support for minor procurements; equipment maintenance; supplies and materials; printing and reproduction; the National Archives and Records Administration (NARA) records center; the Diversity Partnership program; support for the international offices; Small Business Administration Certification; and other services and miscellaneous activities.

Increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex.

Total, Office of the Administrator	**330,314**	**336,826**	**333,700**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 Request ($000)
▪ **Salaries and Benefits**	
Reflects a 2.3 percent decrease associated with the accelerated attrition of NNSA staff by the end of FY 2004, partially offset by the cost of living adjustment, benefits escalation, promotions, and within-grade increases	- 4,959
▪ **Travel**	
No change; increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex..	0
▪ **Support Services**	
No change; increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex..	0

- **Other Related Expenses**

  Increased Information Technology funding is due to the net effect of the Service Center Standup/NNSA Common Environment Project, investing in the project is partially offset by operational costs coming down (+$618,000).

  Increases required for escalation costs or new priority mission areas will be met through further management savings and efficiencies realized from Re-engineering across the NNSA complex.

  Reflects an increase in Other Related Expenses due to completion of Re-engineering efforts associated with final Permanent Change of Station costs in the first quarter of FY 2005; Re-engineering efforts are being funded through the use of prior year balances in FY 2004 (+$1,215,000). .... + 1,833

Total Funding Change, Office of the Administrator .... -3,126

Funding Profile by Category

	(dollars in thousands)				
	FY 2003	FY 2004	FY 2005	$ Change	% Change
Headquarters					
Salaries and Benefits	77,786	83,991	82,081	-1,910	-2.3%
Travel	6,323	6,007	6,007	+0	+0.0%
Support Services	20,034	18,071	18,071	+0	+0.0%
Other Related Expenses	33,421	32,327	31,778	-549	-1.7%
Total, Headquarters	137,564	140,396	137,937	-2,459	-1.8%
Total, Full Time Equivalents	611	610	593	-17	-2.8%
Total, End of Year Headcount	598	593	593	+0	+0.0%
NNSA Service Center					
Salaries and Benefits	70,814	58,141	51,701	-6,440	-11.1%
Travel	2,085	1,799	1,799	+0	+0.0%
Support Services	5,763	6,766	6,766	+0	+0.0%
Other Related Expenses	32,753	36,053	38,435	+2,382	+6.6%
Total, NNSA Service Center	111,415	102,759	98,701	-4,058	-3.9%
Total, Full Time Equivalents	636	527	477	-50	-9.5%
Total, End of Year Headcount	570	477	477	+0	+0.0%
Livermore Site Office					
Salaries and Benefits	8,225	11,453	11,870	+417	+3.6%
Travel	317	317	317	+0	+0.0%
Support Services	2,251	2,251	2,251	+0	+0.0%
Other Related Expenses	2,051	2,051	2,051	+0	+0.0%
Total, Livermore Site Office	12,844	16,072	16,489	+417	+2.6%
Total, Full Time Equivalents	83	90	91	+1	+1.1%
Total, End of Year Headcount	90	91	91	+0	+0.0%
Los Alamos Site Office					
Salaries and Benefits	9,898	12,492	13,799	+1,307	+10.5%
Travel	233	233	233	+0	+0.0%
Support Services	1,038	1,038	1,038	+0	+0.0%
Other Related Expenses	795	795	795	+0	+0.0%
Total, Los Alamos Site Office	11,964	14,558	15,865	+1,307	+9.0%
Total, Full Time Equivalents	77	98	103	+5	+5.1%
Total, End of Year Headcount	87	103	103	+0	+0.0%
Sandia Site Office					
Salaries and Benefits	7,244	10,665	11,127	+462	+4.3%
Travel	113	113	113	+0	+0.0%
Support Services	769	769	769	+0	+0.0%
Other Related Expenses	509	509	509	+0	+0.0%
Total, Sandia Site Office	8,635	12,056	12,518	+462	+3.8%
Total, Full Time Equivalents	63	87	89	+2	+2.3%
Total, End of Year Headcount	83	89	89	+0	+0.0%

(dollars in thousands)	FY 2003	FY 2004	FY 2005	$ Change	% Change
Nevada Site Office					
Salaries and Benefits	11,060	12,734	12,576	-158	-1.2%
Travel	642	475	475	+0	+0.0%
Support Services	1,847	1,200	1,200	+0	+0.0%
Other Related Expenses	2,477	3,291	3,291	+0	+0.0%
Total, Nevada Site Office	16,026	17,700	17,542	-158	-0.9%
Total, Full Time Equivalents	126	108	104	-4	-3.7%
Total, End of Year Headcount	108	104	104	+0	+0.0%
Pantex Site Office					
Salaries and Benefits	8,130	8,954	9,777	+823	+9.2%
Travel	176	176	176	+0	+0.0%
Support Services	1,283	1,283	1,283	+0	+0.0%
Other Related Expenses	355	355	355	+0	+0.0%
Total, Pantex Site Office	9,944	10,768	11,591	+823	+7.6%
Total, Full Time Equivalents	74	77	82	+5	+6.5%
Total, End of Year Headcount	70	82	82	+0	+0.0%
Y-12 Site Office					
Salaries and Benefits	7,769	8,961	9,802	+841	+9.4%
Travel	310	310	310	+0	+0.0%
Support Services	1,005	1,005	1,005	+0	+0.0%
Other Related Expenses	557	557	557	+0	+0.0%
Total, Y-12 Site Office	9,641	10,833	11,674	+841	+7.8%
Total, Full Time Equivalents	73	77	81	+4	+5.2%
Total, End of Year Headcount	70	81	81	+0	+0.0%
Kansas City Site Office					
Salaries and Benefits	5,526	5,684	5,537	-147	-2.6%
Travel	179	179	179	+0	+0.0%
Support Services	44	44	44	+0	+0.0%
Other Related Expenses	252	252	252	+0	+0.0%
Total, Kansas City Site Office	6,001	6,159	6,012	-147	-2.4%
Total, Full Time Equivalents	52	52	50	-2	-3.8%
Total, End of Year Headcount	54	50	50	+0	+0.0%
Savannah River Site Office					
Salaries and Benefits	2,954	2,554	2,331	-223	-8.7%
Travel	288	288	288	+0	+0.0%
Support Services	80	80	80	+0	+0.0%
Other Related Expenses	226	226	226	+0	+0.0%
Total, Savannah River Site Office	3,548	3,148	2,925	-223	-7.1%
Total, Full Time Equivalents	24	22	20	-2	-9.1%
Total, End of Year Headcount	23	20	20	+0	+0.0%

	FY 2003	FY 2004	FY 2005	$ Change	% Change
	(dollars in thousands)				
Chicago Operations Office (Non-NNSA)					
Salaries and Benefits	1,731	1,448	1,501	+53	+3.7%
Travel	110	110	110	+0	+0.0%
Support Services	230	230	230	+0	+0.0%
Other Related Expenses	61	61	61	+0	+0.0%
Total, Chicago Operations Office	2,132	1,849	1,902	+53	+2.9%
Total, Full Time Equivalents	7	11	11	+0	+0.0%
Total, End of Year Headcount	11	11	11	+0	+0.0%
Idaho Operations Office (Non-NNSA)					
Salaries and Benefits	150	132	136	+4	+3.0%
Travel	-	-	-	+0	+0.0%
Support Services	-	-	-	+0	+0.0%
Other Related Expenses	-	-	-	+0	+0.0%
Total, Idaho Operations Office	150	132	136	+4	+3.0%
Total, Full Time Equivalents	1	1	1	+0	+0.0%
Total, End of Year Headcount	1	1	1	+0	+0.0%
Richland Operations Office (Non-NNSA)					
Salaries and Benefits	150	132	136	+4	+3.0%
Travel	-	-	-	+0	+0.0%
Support Services	-	-	-	+0	+0.0%
Other Related Expenses	-	-	-	+0	+0.0%
Total, Richland Operations Office	150	132	136	+4	+3.0%
Total, Full Time Equivalents	1	1	1	+0	+0.0%
Total, End of Year Headcount	1	1	1	+0	+0.0%
Savannah River Operations Office (Non-NNSA)					
Salaries and Benefits	150	132	136	+4	+3.0%
Travel	-	-	-	+0	+0.0%
Support Services	-	-	-	+0	+0.0%
Other Related Expenses	-	-	-	+0	+0.0%
Total, Savannah River Operations Office	150	132	136	+4	+3.0%
Total, Full Time Equivalents	-	1	1	+0	+0.0%
Total, End of Year Headcount	1	1	1	+0	+0.0%
Oak Ridge Operations Office (Non-NNSA)					
Salaries and Benefits	150	132	136	+4	+3.0%
Travel	-	-	-	+0	+0.0%
Support Services	-	-	-	+0	+0.0%
Other Related Expenses	-	-	-	+0	+0.0%
Total, Oak Ridge Operations Office	150	132	136	+4	+3.0%
Total, Full Time Equivalents	1	1	1	+0	+0.0%
Total, End of Year Headcount	1	1	1	+0	+0.0%

(dollars in thousands)	FY 2003	FY 2004	FY 2005	$ Change	% Change
Office of the Administrator					
Salaries and Benefits..	211,737	217,605	212,646	-4,959	-2.3%
Travel..	10,776	10,007	10,007	+0	+0.0%
Support Services..	34,344	32,737	32,737	+0	+0.0%
Other Related Expenses.....................................	73,457	76,477	78,310	+1,833	+2.4%
Total, Office of the Administrator............................	330,314	336,826	333,700	-3,126	-0.9%
Total, Full Time Equivalents..	1,829	1,763	1,705	-58	-3.3%
Total, End of Year Headcount.....................................	1,768	1,705	1,705	+0	+0.0%

Support Services

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Technical Support	22,323	21,279	21,279	0	0.0%
Management Support.............................	5,152	4,911	4,911	0	0.0%
Administrative Support	6,869	6,547	6,547	0	0.0%
Subtotal, Support Services	34,344	32,737	32,737	0	0.0%
ADP Support (Information Technology)	13,037[a]	18,736[a]	19,419[a]	+ 683	+ 3.6%
Total, Support Services...........................	47,381	51,473	52,156	+ 683	+ 1.3%

Other Related Expenses

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Working Capital Fund[b]	29,404	29,956	29,956	0	0.0%
Miscellaneous Purchases/Other	10,939	10,352	11,567	+ 1,215	+ 11.7%
Training.	1,859	1,810	1,810	0	0.0%
Reception and Representation	12	12	12	0	0.0%
Subtotal, Other Related Expenses..........	42,214	42,130	43,345	+ 1,215	+ 2.9%
Information Technology	18,206[c]	15,611[c]	15,546[c]	-65	- 0.4%
Total, Other Related Expenses...............	60,420	57,741	58,891	+ 1,150	+ 2.0%

[a] Information Technology funding is included in total in the Other Related Expenses budget request and shown on this table under Support Services for comparability purposes only.

[b] Includes Rental Space and Facility Maintenance.

[c] The balance of the Information Technology budget request is shown in Support Services and not reflected on this table under Other Related Expenses for comparability purposes only.

Weapons Activities

Weapons Activities

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Weapons Activities

Proposed Appropriation Language

For Department of Energy expenses, including the purchase, construction, and acquisition of plant and capital equipment and other incidental expenses necessary for atomic energy defense weapons activities in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion; the purchase of not to exceed [six] *19* passenger motor vehicles, for replacement only, including not to exceed two buses; [$6,272,511,000], *$6,568,453,000* to remain available until expended.

Explanation of Change

Changes from the language proposed in FY 2004 consist of a change to the number of proposed motor vehicles and funding amounts.

Weapons Activities

Funding Profile by Subprogram

(dollars in thousands)

Weapons Activities	FY 2003 Comparable Appropriation	FY 2004 Original Appropriation	FY 2004 Adjustments [a]	FY 2004 Comparable Appropriation	FY 2005 Request
Directed Stockpile Work	1,259,136	1,340,286	- 13,630	1,326,656	1,406,435
Science Campaign	260,867	250,548	+ 23,300	273,848	300,962
Engineering Campaign	270,502	344,387	- 79,472	264,915	242,984
Inertial Confinement Fusion and High Yield Campaign ..	499,230	517,269	- 3,018	514,251	492,034
Advanced Simulation and Computing Campaign	674,453	725,626	- 4,250	721,376	741,260
Pit Manufacturing and Certification Campaign	261,807	298,528	- 1,738	296,790	336,473
Readiness Campaign	270,147	247,097	+ 81,819	328,916	280,127
Readiness in Technical Base and Facilities	1,480,872	1,664,235	- 123,590	1,540,645	1,474,454
Secure Transportation Asset	168,548	162,400	- 948	161,452	201,300
Nuclear Weapons Incident Response	81,114	0	+ 89,167	89,167	99,209
Facilities and Infrastructure Recapitalization Program ...	235,474	240,123	- 1,368	238,755	316,224
Safeguards & Security	558,161	585,750	- 3,280	582,470	706,991
Subtotal, ... Weapons Activities	6,020,311	6,376,249	- 37,008	6,339,241	6,598,453
Use of Prior Year Balances	- 29,981	- 74,753	- 2,000	- 76,753	0
Security Charge for Reimbursable Work	- 28,985	- 28,985	+ 0	- 28,985	- 30,000
Total, Weapons Activities	5,961,345	6,272,511	- 39,008	6,233,503	6,568,453

Public Law Authorization:

P.L. 108-136, National Defense Authorization Act, FY 2004

P.L. 108-137, Energy and Water Development Appropriations Act, FY 2004

[a] Reflects distribution of the rescission of $37,007,815 from the Consolidated (Omnibus) Appropriations Bill for FY 2004 and comparability adjustments. Reference the “FY 2004 Appropriation” table for additional details on these adjustments.

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Weapons Activities						
Directed Stockpile Work	1,406,435	1,521,175	1,648,144	1,778,400	1,812,398	8,166,552
Science Campaign	300,962	301,382	307,784	328,330	341,028	1,579,486
Engineering Campaign	242,984	268,207	226,357	284,020	236,838	1,258,406
Inertial Confinement Fusion and High Yield Campaign................................	492,034	521,319	535,070	437,069	440,557	2,426,049
Advanced Simulation and Computing Campaign..	741,260	781,509	825,705	834,160	848,359	4,030,993
Pit Manufacturing and Certification Campaign..	336,473	323,508	314,180	154,579	158,168	1,286,908
Readiness Campaign.........................	280,127	330,801	307,383	357,027	376,460	1,651,798
Readiness in Technical Base and Facilities	1,474,454	1,600,185	1,753,217	1,839,266	1,915,754	8,582,876
Secure Transportation Asset	201,300	185,000	185,971	190,014	195,000	957,285
Nuclear Weapons Incident Response..	99,209	100,136	100,657	98,331	100,609	498,942
Facilities and Infrastructure Recapitalization Program	316,224	372,707	425,848	472,114	475,531	2,062,424
Safeguards & Security.......................	706,991	607,071	618,684	613,690	626,298	3,172,734
Subtotal, Weapons Activities.............	6,598,453	6,913,000	7,249,000	7,387,000	7,527,000	35,674,453
Security Charge for Reimbursable Work...	- 30,000	- 32,000	- 33,000	- 34,000	- 35,000	- 164,000
Total, Weapons Activities...................	6,568,453	6,881,000	7,216,000	7,353,000	7,492,000	35,510,453

FY 2003 Execution

(dollars in thousands)

	FY 2003 Approp	Use of PY Bal/ General Reduction	Rescis-sion	Supple-mental	Reprogram-ming	Comp Adjust	Current FY 2003 Comparable
Directed Stockpile Work	1,234,467	- 27,988	- 7,841	0	- 5,983	66,481	1,259,136
Science Campaign	255,468	- 5,791	- 1,623	0	- 4,043	16,856	260,867
Engineering Campaign	233,697	- 5,297	- 1,485	0	- 1,314	44,901	270,502
Inertial Confinement Fusion and High Yield Campaign	504,293	- 11,433	- 3,204	0	8,530	1,044	499,230
Advanced Simulation and Computing Campaign	704,335	- 15,969	- 4,472	0	- 9,441	0	674,453
Pit Manufacturing and Certification Campaign	222,000	- 5,033	- 1,410	0	4,770	41,480	261,807
Readiness Campaign	213,752	- 4,847	- 1,358	0	13,387	49,213	270,147
Readiness in Technical Base and Facilities	1,832,222	- 41,541	- 11,638	0	24,075	- 322,246	1,480,872
Secure Transportation Asset	152,989	- 3,469	- 972	20,000	0	0	168,548
Nuclear Weapons Incident Response	0	0	0	0	0	81,114	81,114
Facilities and Infra Recapitalization Program	242,512	- 5,498	- 1,540	0	0	0	235,474
Safeguards & Security	526,254	- 11,934	- 3,159	47,000	0	0	558,161
Subtotal, Weapons Activities	6,121,989	- 138,800	- 38,702	67,000	29,981	- 21,157	6,020,311
Use of Prior Year Balances	0	-29,981	0	0	0	0	-29,981
Security Charge for Reimbursable Work	-28,985	0	0	0	0	0	-28,985
Subtotal, Weapons Activities	6,093,004	-168,781	-38,702	67,000	29,981	-21,157	5,961,345

FY 2004 Appropriation

(dollars in thousands)

	FY 2004 Enacted Approp	Use of Prior Year Balance	Pending Rescis-sion	Supple-mental	Reprogram-ming/Transfers	Comp Adjustments	Current FY 2004 Comp
Directed Stockpile Work	1,340,286	0	- 7,835	0	0	-5,795	1,326,656
Science Campaign	250,548	0	- 1,444	0	0	24,744	273,848
Engineering Campaign	344,387	0	- 2,011	0	0	- 77,461	264,915
Inertial Confinement Fusion and High Yield Campaign	517,269	0	- 3,018	0	0	0	514,251
Advanced Simulation and Computing Campaign	725,626	0	- 4,250	0	0	0	721,376
Pit Manufacturing and Certification Campaign	298,528	0	- 1,738	0	0	0	296,790
Readiness Campaign	247,097	0	- 1,437	0	0	83,256	328,916
Readiness in Technical Base and Facilities	1,664,235	0	- 9,679	0	0	- 113,911	1,540,645
Secure Transportation Asset	182,400	-20,000	-948	0	0	0	161,452
Nuclear Weapons Incident Response	0	0	0	0	0	89,167	89,167
Facilities and Infra Recapitalization Program	240,123	0	- 1,368	0	0	0	238,755
Safeguards & Security	585,750	0	- 3,280	0	0	0	582,470
Subtotal, Weapons Activities	6,396,249	- 20,000	- 37,008	0	0	0	6,339,241
Use of prior year balances	0	- 74,753	0	0	-2,000	0	-76,753
Security Charge for Reimbursable Work	-28,985	0	0	0	0	0	-28,985
Total, Weapons Activities	6,367,264	-94,753	-37,008	0	-2,000	0	6,233,503

Mission

The Weapons Activities mission is to ensure that our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security, and reliability of the U.S. nuclear weapons stockpile.

Benefits

The Weapons Activities program supports the NNSA and DOE mission by maintaining a robust infrastructure of people, programs, and facilities to provide specialized scientific and technical capability for stewardship of the nuclear weapon stockpile.

Strategic and Program Goals

The Weapons Activities program has one program goal which contributes to General Goal 1 in the "goal cascade":

General Goal 1, Nuclear Weapons Stewardship: Ensure that our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security and reliability of the U.S. Nuclear Stockpile.

Contribution to General Goal 1

Within the Weapons Activities appropriation, thirteen programs each make unique contributions to General Goal 1 as follows:

The Directed Stockpile Work program (Program Goal 01.27.00.00) contributes to this goal by ensuring that the nuclear warheads in the U.S. nuclear stockpile are safe, secure, and reliable. This goal is achieved by: (1) developing solutions to extend weapon life, correcting potential technical issues; (2) conducting scheduled warhead maintenance; (3) dismantling warheads retired from the stockpile; (4) conducting evaluations to certify warhead reliability and to detect/predict potential weapon fixes, mainly from aging; (5) producing and refurbishing warheads to install the life extension solutions and other fixes; and (6) researching advanced concepts. The Directed Stockpile Work is planned in partnership with the Department of Defense.

The Science Campaign program (Program Goal 01.28.00.00) contributes to this goal by developing the knowledge, tools and methods needed to assess with confidence the performance of the nuclear explosive package without further underground testing. This is achieved by developing predictive capabilities for nuclear primary and secondary performance, understanding material properties, constructing and maintaining essential scientific facilities/capabilities, and maintaining the readiness of the NNSA to conduct nuclear testing if directed by the President.

The Engineering Campaign program (Program Goal 01.29.00.00) contributes to this goal by providing validated engineering sciences and engineering modeling and simulation tools for design, qualification, assessment, and certification; improved surety technologies, improved radiation hardened design and modeling capabilities; improved microsystems and microtechnologies; and engineering solutions to identify aging problems based on a predictive understanding of aging phenomenon of all materials.

The Inertial Confinement Fusion Ignition and High Yield program (Program Goal 01.30.00.00) contributes to this goal by developing laboratory capabilities to create and measure extreme conditions of temperature, pressure, and radiation approaching those in a nuclear explosion and by conducting weapons related research in these environments. This capability is required to support assessments and certification of the nation's nuclear weapons stockpile. Additionally, the ICF campaign is pursuing the goal of achieving controlled fusion ignition in the laboratory. If achieved, this will provide further capabilities to understand important issues regarding boost, burn and nuclear effects that cannot be achieved otherwise.

The Advanced Simulation and Computing program (Program Goal 01.31.00.00) contributes to this goal by providing leading edge, high-end simulation capabilities used in all weapons assessment and certifications.

The Pit Manufacturing and Certification program (Program Goal 01.32.00.00) contributes to this goal by restoring the capability and some limited capacity to manufacture pits of all types required by the nuclear weapons stockpile including planning the design and construction of a Modern Pit Facility (MPF) to support long-term pit manufacturing.

The Readiness Campaign program (Program Goal 01.33.00.00) contributes to this goal by developing or reestablishing new manufacturing processes and technologies for qualifying weapon components for reuse.

The Readiness in Technical Base and Facilities (Operations and Maintenance) program (Program Goal 01.34.00.00) contributes to this goal by operating and maintaining National Nuclear Security Administration facilities in a safe, secure, efficient, and reliable condition so that they are operationally ready to execute nuclear weapons stockpile stewardship tasks on-time as identified by the Directed Stockpile Work and Campaign programs. This includes contractor facility operating costs (e.g. utilities, equipment, facility personnel, training, and salaries); facility and equipment maintenance costs (staff, tools, and replacement parts); other project costs; environmental, safety, and health costs; the capability to recover and recycle plutonium, highly-enriched uranium, and tritium to support a safe and reliable nuclear stockpile; and specialized storage containers sufficient to support the requirements of the nuclear weapons stockpile.

The Readiness in Technical Base and Facilities (Construction) program (Program Goal 01.35.00.00) contributes to this goal by funding new and ongoing line-item construction projects which support the nuclear weapons complex, but are not directly attributable to Directed Stockpile Work (DSW) or a specific campaign. RTBF construction focuses on state-of-the-art facilities and infrastructure and advanced scientific and technical tools, within the approved baseline cost and schedule, to ensure a reliable nuclear weapons stockpile.

The Secure Transportation Asset program (Program Goal 01.36.00.00) contributes to this goal by providing a capability for the safe and secure transport of nuclear weapons, components, and materials that will meet projected NNSA, Department of Energy, and other customer requirements.

The Nuclear Weapons Incident Response program (Program Goal 01.37.00.00) contributes to this goal by serving as the Department of Energy and the National Nuclear Security Administration primary point of contact for all emergency management activities, developing and issuing all policy, procedures, guidance and training, and overseeing implementation of the Department's Emergency Management System. The program administers and directs the emergency response programs that provide the capability to respond to and mitigate a nuclear or radiological incident or emergency within the U.S. and abroad.

The Facilities Infrastructure and Recapitalization Program (FIRP) (Program Goal 01.38.00.00) contributes to this goal by restoring and revitalizing the physical infrastructure of the nuclear weapons complex – the third leg of the new Triad as identified in the December 2001 *Nuclear Posture Review and released by the Administration in January 2002*. The program applies new direct appropriations to address an integrated, prioritized series of repair and infrastructure projects focusing on deferred maintenance that will significantly increase the operational efficiency and effectiveness of the NNSA weapons complex sites.

The Safeguards and Security program (Program Goal 01.39.00.00) contributes to this goal by protecting NNSA personnel, facilities, nuclear weapons, and information from terrorists and other post September 11 threats in a cost-effective manner.

Annual Performance Results and Targets

Annual performance results and targets for Weapons Activities work are included in the sub-program sections of this budget where it is more meaningful to the reader.

Means and Strategies

The Weapons Activities program will use various means and strategies to achieve its program goals. However, various external factors may impact the ability to achieve these goals. The program also performs collaborative activities to help meet its goals.

The NNSA will conduct a wide range of tests and experimental activities to assess the continuing safety and reliability of the Nation's nuclear weapons stockpile. Overall technical reviews by the weapons laboratories of the stockpile will encompass laboratory and flight tests of materials and components, and surveillance tests. Computer simulations of weapons will be used in these assessments. Weapons analyses will utilize data archived from past underground nuclear tests, along with laboratory radiation and nuclear burn as well as dynamic experiments with plutonium and other materials. Working through the weapon production plants and the laboratories, NNSA will make deliveries of limited life and other weapon components for nuclear weapons stockpile management and refurbishment, according to schedules developed jointly by the NNSA and the Department of Defense (DoD). Dismantlement activities are also carried out in support of this objective. Activities will be conducted with DoD, ranging from training in nuclear weapons field maintenance to partnerships in research supporting non-nuclear munitions.

The NNSA will continue with the campaigns approach for activities that develop critical capabilities needed to achieve weapons stockpile certification. The campaigns are focused efforts with specific objectives and milestones, planned and executed by integrated teams from the laboratories, Nevada Test Site (NTS) and production plants. The six campaign sub-elements are Science, Engineering, Inertial

Confinement Fusion Ignition and High Yield, Advanced Simulation and Computing, Pit Manufacturing and Certification, and Readiness.

The NNSA will continue to oversee and maintain the physical plant infrastructure at government-owned, contractor-operated laboratories, production plants, and test site, according to applicable statutes, laws, agreements and standards. NNSA is developing detailed facility operation plans to ensure that specific requirements for readiness are maintained. NNSA will implement the recommendation of the Nuclear Posture Review to transition to an enhanced test readiness posture by improving infrastructure, hiring and training personnel, and revising and exercising relevant plans and safety documentation. As proposed by NNSA and approved by the Nuclear Weapons Council, and supported by the FY 2004 National Defense Authorization Act, the goal is to reach an eighteen month underground nuclear test readiness posture by the end of FY 2005. The NNSA will continue to institutionalize responsible and accountable corporate facilities management processes and incorporate best practices from industry and other organizations. This includes implementation of a planning process that results in the submission of Ten Year Comprehensive Site Plans (TYCSPs) that establish the foundation for the strategic planning of the facilities and infrastructure of the complex. The NNSA's complex is a government-owned, contractor-operated enterprise. The NNSA works proactively with its contractors, external regulators, and host communities to assure that facilities and operations are in compliance with all applicable statutes and agreements to preclude any adverse impact to the environment, safety and health of workers and the public and to address emergency management issues while minimizing unscheduled disruption to program activities that could affect performance.

The NNSA will provide for enhancements to the Secure Transportation Asset to meet increased operating and security standards, and will maintain nuclear emergency operations assets. NNSA will identify the workforce skills necessary to meet long-term stockpile stewardship requirements and will develop staffing plans to attract and retain staff.

The Administration's reviews to create a new vision for the role of the Nation's military in the 21^{st} century have the potential to affect performance goals in FY2005 and beyond.

Some activities will be conducted with DoD, ranging from training in nuclear weapons field maintenance to partnerships in research supporting non-nuclear munitions. Stockpile Stewardship activities are synergistic with Work for Others activities, sponsored principally by the DoD.

There are a number of collaborations with universities and colleges, mainly associated with the strategic computing activities, the science campaign and inertial confinement fusion research program. Also, a limited number of technology partnership efforts with industry may be continued for FY 2005.

Validation and Verification

To validate and verify program performance, NNSA will conduct various internal and external reviews and audits. NNSA's programmatic activities are subject to continuing review by the Congress, the General Accounting Office, the Department's Inspector General, the National Security Council, the Defense Nuclear Facilities Safety Board, the Department's Office of Engineering and Construction Management, and the Department's Office of Independent Oversight and Performance Assurance. Each year numerous external independent reviews are conducted of selected projects. Additionally, NNSA Headquarters senior management and Field managers conduct frequent, in-depth reviews of cost, schedule, and scope to ensure projects are on-track and within budget.

NNSA has established a comprehensive validation and verification process as part of its Planning, Programming, Budgeting and Evaluation (PPBE) system. Long-term performance goals are established/validated during the Planning Phase and linked in a performance cascade to annual targets and detailed technical milestones. During the Programming Phase, budget and resources trade-offs and decisions are evaluated based on the impact to annual and long-term performance measures. These NNSA decisions are documented and used to develop the budget requests during the Budgeting Phase. Program and financial performance for each measure is monitored and progress verified during the Execution and Evaluation Phase.

NNSA validation and verification activities during the PPBE Execution and Evaluation phase include a set of tiered performance reviews to examine everything from detailed technical progress to program management controls to corporate performance against long-term goals. This set of reviews includes: (1) the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART); (2) NNSA Administrator Program Reviews; (3) Program Managers Detailed Technical Reviews; (4) quarterly reporting of progress through the Department's JOULE performance tracking system; and (5) the NNSA Administrator's Annual Performance Report.

NNSA is using the OMB PART process to perform annual internal self-assessments of the management strengths and weaknesses of each NNSA program. Among other things, the PART process helps NNSA ensure that quality, clarity, and completeness of its performance data and results are in accordance with standards set in the Government Performance and Results Act of 1993 and reinforced by the President's Management Agenda. Independent PART assessments conducted by OMB provide additional recommendations to strengthen NNSA programs.

Each NNSA program is reviewed at least annually by the NNSA Administrator during the NNSA Administrator Reviews. These reviews involve all members of the NNSA management council to ensure progress and recommendations are fully integrated for corporate improvement. The focus of these reviews is to verify and validate that NNSA programs are on track to meet their long-term goals and annual targets.

A second more detailed review of each program is conducted by the program managers. These Program Manager Detailed Technical Reviews are normally held at least quarterly during the year. The focus of these reviews is to verify and validate that NNSA contractors are achieving detailed technical milestones that result in progress towards annual targets and long-term goals. These two reviews work together to ensure that advanced warnings are given to NNSA managers in order for corrective actions to be implemented. NNSA sites are responsible and accountable for accomplishing the verification and validation of their and their sub-contractors performance data and results prior to submission to NNSA Headquarters.

The results of all of these reviews are reported quarterly in the Department's JOULE performance tracking system and annually in the NNSA Administrator's Annual Performance Report. Both documents help to measures the progress NNSA programs are making toward achieving annual targets and long-term goals. These documents are at a summary level to help senior managers verify and validate progress towards NNSA and Departmental commitments listed in the budget.

In addition, the General Accounting Office, Inspector General, National Security Council, Foster Panel, Defense Nuclear Facility Safety Board, and Secretary of Energy Advisory Board provide independent reviews of NNSA programs. Recent Inspector General reports on the Weapons Activities programs include Controls Over Expenditures Within the Office of Transportation Safeguards (OTS) (A03AL036); Review of Kansas City Plant Operations (A03YT026); Audit of Enriched Uranium Operations (A03YT027); Requirements for Tritium (A03SR022); Audit of Nuclear Weapons Incident Response Program (A03DC006); LANL's Nuclear Materials Stabilization Program (A03LA013); Audit of the Utilization of Safeguards and Security Funding (A03NE009); Execution of Routine Operations at the Nevada Test Site (A03LV024); Highly Enriched Uranium Storage Project at the Y-12 National Security Complex (A03YT028); National Nuclear Security Administration's Enhanced Surveillance Program (A03DC009); and Audit of the Department's Emergency Preparedness (A03PT048).

Program Assessment Rating Tool (PART)

The Office of Management and Budget (OMB) conducted PART reviews for two Weapons Activities programs for the FY 2005 budget. NNSA has received ratings of "Moderately Effective" for these two programs (Inertial Confinement Fusion and High Yield Campaign/NIF (ICF) and Readiness in Technical Base and Facilities – Operations (RTBF)). Each of the programs scored strongly in the Purpose, Planning and Management assessments. Lower scores in the "results and accountability" section reflect the need for improvement in performance metrics for the ICF and RTBF programs. Details of the assessments and the recommendations will be discussed in the individual subprogram justifications.

For the FY 2004 budget, OMB rated three Weapons Activities programs: Advanced Simulations and Computing Campaign (ACSI) was rated as "Effective"; one program as "Moderately Effective", Facilities and Infrastructure Recapitalization Program (FIRP); and one program as "Adequate", Safeguards and Security. ASCI and FIRP were given very high marks for program purpose and performance measurement data. FIRP scored Moderately Effective because it was a new program and therefore had not had time to achieve results. The Safeguards and Security program was praised by OMB for being one of the most secure sets of facilities in the country. However, OMB found the program did not clearly define its performance measures (goals and targets), which resulted in the overall rating of Adequate.

All findings from last year's assessments have been addressed. OMB has acknowledged improvement in Safeguards and Security's performance measures, and OMB plans to reassess this program next year.

Funding by General and Program Goal

(dollars in thousands)

	FY 2003 Approp	FY 2004 Approp	FY 2005 Request	FY 2006	FY 2007	FY 2008	FY 2009
Program Goal 01.27.00.00, Directed Stockpile Work..........	1,259,136	1,326,656	1,406,435	1,521,175	1,648,144	1,778,400	1,812,398
Program Goal 01.28.00.00, Science Campaign..................	260,867	273,848	300,962	301,382	307,784	328,330	341,028
Program Goal 01.29.00.00, Engineering Campaign	270,502	264,915	242,984	268,207	226,357	284,020	236,838
Program Goal 01.30.00.00, Inertial Confinement Fusion and High Yield Campaign...............	499,230	514,251	492,034	521,319	535,070	437,069	440,557
Program Goal 01.31.00.00, Advanced Simulation and Computing Campaign..............	674,453	721,376	741,260	781,509	825,705	834,160	848,359
Program Goal 01.32.00.00, Pit Manufacturing and Certification Campaign	261,807	296,790	336,473	323,508	314,180	154,579	158,168
Program Goal 01.33.00.00, Readiness Campaign..............	270,147	328,916	280,127	330,801	307,383	357,027	376,460
Program Goal 01.34.00.00, Readiness in Technical Base and Facilities (O&M)...............	1,289,872	1,281,696	1,268,152	1,298,149	1,371,176	1,400,798	1,461,770
Program Goal 01.35.00.00, Readiness in Technical Base and Facilities Construction	191,000	258,949	206,302	302,036	382,041	438,468	453,984
Program Goal 01.36.00.00, Secure Transportation Asset.....	168,548	161,452	201,300	185,000	185,971	190,014	195,000
Program Goal 01.37.00.00, Nuclear Weapons Incident Response	81,114	89,167	99,209	100,136	100,657	98,331	100,609
Program Goal 01.38.00.00, Facilities and Infrastructure Recapitalization Program..........	235,474	238,755	316,224	372,707	425,848	472,114	475,531
Program Goal 01.39.00.00, Safeguards & Security	558,161	582,470	706,991	607,071	618,684	613,690	626,298
Subtotal, Weapons Activities	6,020,311	6,339,241	6,598,453	6,913,000	7,249,000	7,387,000	7,527,000
Use of Prior Year Balances.......	- 29,981	- 76,753	0	0	0	0	0
Security Charge for Reimbursable Work	- 28,985	- 28,985	- 30,000	- 32,000	- 33,000	- 34,000	- 35,000
Total, Weapons Activities......	**5,961,345**	**6,233,503**	**6,568,453**	**6,881,000**	**7,216,000**	**7,353,000**	**7,492,000**

Funding for a proportional share of NNSA's annual assessment required to pay for Defense Contract Audit Agency activities is included in this appropriation. The amount estimated for the Weapons Activities is $1,698,563 for FY 2004 and $1,795,283 for FY 2005, to be paid from program funding.

Funding for a proportional share of the NNSA assessment for conducting External Independent Reviews on pending construction projects is included in this appropriation. The amount estimated for Weapons Activities is $686,000, to be paid from program funding.

Directed Stockpile Work

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004 [a]	FY 2005	$ Change	% Change
Directed Stockpile Work					
B61 Life Extension Program	71,927	86,113	117,927	+ 31,814	+ 36.9%
W76 Life Extension Program	100,237	146,363	213,111	+ 66,748	+ 45.6%
W80 Life Extension Program	116,774	144,702	146,400	+ 1,698	+ 1.2%
W87 Life Extension Program	116,665	66,305	0	- 66,305	- 100.0%
B61 Stockpile Systems	129,294	84,624	91,256	+ 6,632	+ 7.8%
W62 Stockpile Systems	24,139	18,062	18,401	+ 339	+ 1.9%
W76 Stockpile Systems	92,250	138,019	137,527	- 492	- 0.4%
W78 Stockpile Systems	71,209	53,110	44,313	- 8,797	- 16.6%
W80 Stockpile Systems	50,236	43,474	49,507	+ 6,033	+ 13.9%
B83 Stockpile Systems	59,943	57,703	44,995	- 12,708	- 22.0%
W84 Stockpile Systems	7,513	4,145	6,119	+ 1,974	+ 47.6%
W87 Stockpile Systems	76,392	88,902	94,884	+ 5,982	+ 6.7%
W88 Stockpile Systems	49,541	55,734	49,093	- 6,641	- 11.9%
Retired Warheads Stockpile Systems	40,518	58,640	65,258	+ 6,618	+ 11.3%
Stockpile Services Research & Development Certification and Safety	139,810	156,196	157,986	+ 1,790	+ 1.1%
Stockpile Services Management, Technology, and Production	98,111	111,129	133,101	+ 21,972	+ 19.8%
Stockpile Services Advanced Concepts	0	6,000	9,000	+ 3,000	+ 50.0%
Stockpile Services Robust Nuclear Earth Penetrator	14,577	7,435	27,557	+ 20,122	+ 270.6%
Total, Directed Stockpile Work	1,259,136	1,326,656	1,406,435	+ 79,779	+ 6.0%

[a] FY 2004 reflects a comparability adjustment of $5,795,000 moving MIE-Computer Numerical Controller Lathe and Glovebox to Readiness Campaign.

FYNSP Schedule
(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
B61 Life Extension Program	117,927	139,765	137,998	118,607	60,888	575,185
W76 Life Extension Program	213,111	204,435	200,794	199,499	254,271	1,072,110
W80 Life Extension Program	146,400	172,878	187,058	186,009	178,352	870,697
W87 Life Extension Program	0	0	0	0	0	0
B61 Stockpile Systems	91,256	103,369	118,651	156,783	156,029	626,088
W62 Stockpile Systems	18,401	14,808	11,747	9,929	7,692	62,577
W76 Stockpile Systems	137,527	135,222	119,916	140,475	141,443	674,583
W78 Stockpile Systems	44,313	65,067	90,975	100,906	94,575	395,836
W80 Stockpile Systems	49,507	55,049	63,139	63,301	68,338	299,334
B83 Stockpile Systems	44,995	51,176	61,671	69,882	61,108	288,832
W84 Stockpile Systems	6,119	4,308	2,031	5,099	3,723	21,280
W87 Stockpile Systems	94,884	78,338	64,277	54,997	52,659	345,155
W88 Stockpile Systems	49,093	53,797	57,679	122,631	125,710	408,910
Retired Warheads Stockpile Systems	65,258	23,809	13,860	15,705	16,811	135,443
Stockpile Services Research & Development Certification and Safety	157,986	204,828	255,244	270,276	280,199	1,168,533
Stockpile Services Management, Technology, and	133,101	104,946	102,859	121,275	192,712	654,893

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Production						
Stockpile Services Advanced Concepts	9,000	14,425	14,874	14,595	29,472	82,366
Stockpile Services Robust Nuclear Earth Penetrator Research and Development	27,557	94,955	145,371	128,431	88,416	484,730
Total, Directed Stockpile Work	1,406,435	1,521,175	1,648,144	1,778,400	1,812,398	8,166,552

Description

The goal of Directed Stockpile Work (DSW) is to ensure that the nuclear warheads and bombs in the U.S. nuclear weapons stockpile are safe, secure, and reliable. This goal is achieved by: (1) developing solutions to extend weapon life, correcting potential technical issues; (2) conducting scheduled warhead/bomb maintenance; (3) dismantling warheads/bombs retired from the stockpile; (4) conducting evaluations to certify warhead/bomb reliability and to detect/predict potential weapon fixes, mainly from aging: (5) producing and refurbishing warheads/bombs to install the life extension solutions and other fixes: and (6) researching advanced concepts. The DSW effort is fully coordinated with the Department of Defense (DoD).

Benefits to Program Goal 01.27.00.00 Directed Stockpile Work
Within the Directed Stockpile Stewardship program, several subprograms each make unique contributions to Program Goal 01.27.00.00. Four subprograms are working to extend the life of 4 nuclear warheads (B61, W76, W80 and W87). Nine other subprograms are working to ensure the warheads in the enduring stockpile are safe and reliable. These subprograms activities include ongoing assessment and certification activities, Limited Life Component Exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work for the B61, W62, W76, W78, W80, B83, W84, W87, and W88. The remaining five subprograms contribute to the goal by retiring and dismantling/disposing of warheads; conducting research and development, certification, and safety efforts; performing quality, engineering and plant management; technology, and production services; investigating advanced concepts; and researching the Robust Nuclear Earth Penetrator.

Background Information

Phase 6.X Process. This defines a common set of phases and procedures to be used for all activities supporting joint DoD-DOE nuclear weapons development, sustainment, and retirement projects, as agreed by the DoD, DOE, and the Nuclear Weapons Council. Procedures include appropriate levels of review and decision authority, consistent with approved guidelines

<u>Phase 6.1 Concept Assessment:</u> Continuing studies and continuous exchange of information, both formal and informal, resulting in the focusing of sufficient interest in an idea for a new or modified weapon or component, or sustainment concept.

<u>Phase 6.2 Feasibility Study and Option Down Select:</u> Determination of the feasibility and desirability to undertake a new weapon or sustainment project, establishment of military characteristics, and determination of respective responsibilities between the DOE and the DoD for the various tasks involved in program execution.

<u>Phase 6.2A Design Definition and Cost Studies:</u> The DOE identifies information on costs, production schedules, options, and tradeoffs, including those involving safety, security, survivability, and control features for the weapon, and the DoD develops the necessary plans, such as flight testing, trainer, and handling gear procurement, and procurement of new DoD components.

<u>Phase 6.3 Development Engineering:</u> Begins with the launching of DOE's development or sustainment program, through the determination of specifications, and culminates in the design release by the design laboratories.

<u>Phase 6.4 Production Engineering</u>: Activities adapting the design into a manufacturing system that can produce weapons and components on a production basis, culminating in the DOE release of the design for production or engineering releases for sustainment.

<u>Phase 6.5 First Production</u>: Production of the first new or sustained weapons, their evaluation by the DOE and the DoD, and the DoD's formal acceptance action or approval for full-scale production or modification.

<u>Phase 6.6 Full-Scale Production</u>: The DOE undertakes the full-scale production of new or sustained weapons for the stockpile.

<u>Phase 7 Retirement</u>: Begins with the first physical removal of the weapon from the stockpile.

Weapons Systems Cost Data

The Weapons Activities portion of the budget will be supplemented with a classified annex which will contain the Selected Acquisition Reports (SARs) for the four life extension programs (LEPs) consistent in format with those submitted by the DoD.

The following table shows in a notional sense the crosswalk from prior year functional reporting to weapons systems reporting.

FY 2005 Cross walk from DSW Functional Reporting to DSW by Warhead Type

	Stockpile R&D	Stockpile Maintenance	Stockpile Evaluation	Dismantlement	Field, Eng., Training & Manuals	Production Support
B61 Life Extension Program	XXX	XXX	XXX			XXX
W76 Life Extension Program	XXX	XXX	XXX			XXX
W80 Life Extension Program...........	XXX	XXX	XXX			XXX
W87 Life Extension Program...........		XXX	XXX			XXX

FY 2005 Cross walk from DSW Functional Reporting to DSW by Warhead Type

	Stockpile R&D	Stockpile Maintenance	Stockpile Evaluation	Dismantlement	Field, Eng., Training & Manuals	Production Support
B61 Stockpile Systems	XXX	XXX	XXX	XXX	XXX	XXX
W62 Stockpile Systems	XXX	XXX	XXX	XXX	XXX	XXX
W76 Stockpile Systems	XXX	XXX	XXX	XXX	XXX	XXX
W78 Stockpile Systems	XXX	XXX	XXX	XXX	XXX	XXX
W80 Stockpile Systems	XXX	XXX	XXX	XXX	XXX	XXX
B83 Stockpile Systems	XXX	XXX	XXX		XXX	XXX
W84 Stockpile Systems	XXX	XXX	XXX		XXX	XXX
W87 Stockpile Systems	XXX	XXX	XXX		XXX	XXX
W88 Stockpile Systems	XXX	XXX	XXX		XXX	XXX
Retired Warheads Stockpile Systems			XXX	XXX		XXX
Stockpile Services Research & Development Certification and Safety	XXX					
Stockpile Services Management, Technology, and Production .		XXX	XXX		XXX	XXX
Stockpile Services Advanced Concepts	XXX					
Stockpile services Robust Nuclear Earth Penetrator	XXX					

Planning and Scheduling. The DSW Program and Implementation Plans contain cost, scope, and schedule for work accomplishment. More detailed classified schedules are contained in the site Research & Development (R&D) and production documents. Stockpile maintenance, refurbishment, and life extension efforts are currently delineated in the Production & Planning Directive (P&PD) and the Stockpile Life Extension and Refurbishment Planning Component Description Document. These requirements are further promulgated to the nuclear weapons complex through individual weapons system Program Control Documents (PCDs) and the Master Nuclear Schedule (MNS). Refurbishment activities in FY 2005 will focus on accomplishing alterations (Alts), modifications (Mods), and refurbishment/replacement of bomb/warhead components to extend the life of the stockpile under approved programs. Critical to the stockpile maintenance program is the ability of the nuclear weapons complex to meet new delivery schedules and to assure through continuous monitoring, that any new impacts to the progress of this effort is mitigated or prevented.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapons stockpile. (MET GOAL)	Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile. (MET GOAL)	Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile. (MET GOAL)	Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile. (MET GOAL)
Meet all annual weapons alteration and modification schedules developed jointly by DOE and DoD. (BELOW EXPECTATION: Six of the 11 modifications were behind schedule. Revised schedules have been negotiated with DoD that will meet their operational needs.)	Meet all annual weapons maintenance and refurbishment schedules developed jointly by the DOE and DoD. (MET GOAL)	Meet all annual weapons maintenance, refurbishment, and dismantlement schedules developed jointly by the DOE and DoD. (MET GOAL)	Meet all annual weapons maintenance, refurbishment, and dismantlement schedules developed jointly by the DOE and DoD. (MIXED RESULTS)
Adhere to approved schedules for the safe and secure dismantlement of nuclear warheads that have been removed from the U.S. nuclear weapon stockpile. (MET GOAL)	Meet annual schedules for the safe and secure dismantlement of nuclear warheads that have been removed from the U.S. nuclear weapon stockpile. (MET GOAL)		

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percent complete of required assessments & reports to support stockpile certification to the President	Completed 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Complete 100% of required Annual Stockpile Certification and Surety assessments & reports.	Ongoing
Annual percentage of completed maintenance supporting Enduring Stockpile Maintenance in accordance with the Production Control Document (PCD) schedules (EFFICIENCY MEASURE)	Accomplished 92.7% of all PCD-scheduled activity. Finished 79.2% of all prior year non-completed scheduled evaluations.	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations.	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations. .	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations. Initiate new material evaluations of the Alteration 357 B61-7/11 LEP.	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations. Initiate final cycle of W62 evaluation prior to retirement.	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations. Initiate new W76-1 LEP material evaluation.	Accomplish 95 % of all PCD-scheduled activity. Finish 100 % of all prior year non-completed scheduled evaluations. Initiate a retirement surveillance program for the W62. Initiate new W80-3 LEP material evaluation.	Ongoing
Cumulative percentage of progress in completing Phases* of Nuclear Weapons Council (NWC)-approved B61-7/11 Life Extension Program (LEP)	Completed 100% of B61-7/11 Phase 6.3 activity.	Receive B61-7/11 Phase 6.4 authorization. Complete initial 30% of scheduled B61-7/11 Phase 6.4 activity.	Complete 100% of scheduled B61-7/11 Phase 6.4 activity.	-Complete 100% of scheduled B61-7/11 Phase 6.5 activity. Deliver First Production Unit (FPU). Receive B61-7/11 Phase 6.6 Authorization. Complete 8% of scheduled B61-7/11 Phase 6.6 activity.	Complete 38% of scheduled B61-7/11 Phase 6.6 activity.	Complete 69% of scheduled B61-7/11 Phase 6.6 activity.	Complete 100% of scheduled B61-7/11 Phase 6.6 activity.	Complete B61-7/11 refurbishment FY 2009

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of progress in completing Phases* of NWC-approved W76-1 LEP	Completed initial 50% of W76-1 Phase 6.3 activity.	Complete 75% of scheduled W76-1 Phase 6.3 activity. Complete initial 10% of W76-1 Phase 6.4 activity.	Complete 95% of scheduled W76-1 Phase 6.3 activity. Obtain W76-1 Phase 6.4 authorization. Complete 25% of W76-1 Phase 6.4 activity.	Complete 100% of scheduled W76-1 Phase 6.3 activity. Complete 65% of W76-1 Phase 6.4 activity.	Complete 100% of scheduled W76-1 Phase 6.4 activity. Deliver FPU. Obtain W76-1 Phase 6.6 authorization.	Complete 4% of scheduled W76-1 Phase 6.6 activity.	Complete 11% of scheduled W76-1 Phase 6.6 activity.	Complete W76-1 refurbishment FY 2013
Cumulative percentage of progress in completing Phases* of NWC-approved W80-3 LEP	Completed 55% of scheduled W80-3 Phase 6.3 activity. Rebaselined the W80-3 LEP.	Complete 70% of scheduled W80-3 Phase 6.3 activity. Complete initial 10% of scheduled W80 Phase 6.4 activity.	Obtain W80 Phase 6.3 authorization. Complete 100% of scheduled W80-3 Phase 6.3 activity. Complete 35% of scheduled W80-3 Phase 6.4 activity.	Complete 60% of W80-3 Phase 6.4 activity.	Complete 85% of scheduled W80-3 Phase 6.4 activity.	Deliver FPU. Complete 100% of scheduled W80-3 Phase 6.4 activity. Obtain W80 Phase 6.5 authorization.	Obtain W80 Phase 6.6 authorization. Complete 15% of scheduled W80-3 Phase 6.6 activity.	Complete W80-3 refurbishment FY 2015
Cumulative percentage of progress in completing Phases* of NWC-approved W87-1 LEP	Completed work activity in accordance with Directive Schedule.	Complete scheduled Alteration 342 to W87.						LEP pending decision and direction
Cumulative percentage progress in completing Phase 6.2/6.2A* activities of the Robust Nuclear Earth Penetrator (RNEP)	N/A	Complete 17% of scheduled RNEP Phase 6.2/6.2A activity.	Complete 56% of scheduled RNEP Phase 6.2/6.2A activity.	Complete 100% of scheduled RNEP Phase 6.2/6.2A activity.	Report results of RNEP Phase 6.2/6.2A to Nuclear Weapons Council. Obtain, if applicable, RNEP Phase 6.3 appropriate authorization. Complete initial 25% of scheduled RNEP Phase	Complete 65% of scheduled RNEP Phase 6.3 activity (if appropriately authorized).	Complete 100% of scheduled RNEP Phase 6.3 activity (if authorized). Complete 15% of scheduled RNEP Phase 6.4 activity (if appropriately authorized).	Ongoing (if appropriately authorized)

6.3 activity (if authorized).

*The DoD-DOE Phase 6.X Process for weapon refurbishment includes Phase 6.1, Concept Assessment; 6.2, Feasibility Study and Option Down Select; 6.2A, Design Definition and Cost Studies; 6.3, Development Engineering; 6.4, Production Engineering, 6.5, First Production; and 6.6, Full-Scale Production.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
B61 Life Extension Program...	**71,927**	**86,113**	**117,927**

The B61 Life Extension Program includes refurbishment of the canned subassembly (CSA); and replacement of associated seals, foam supports, cables and connectors, the group X kit, and limited life components on the B61 Mods 7 and 11. The complex will produce two lots of process prove-in hardware and will start production of war reserve quality parts in FY 2005. Process prove-in hardware production demonstrates that plants have adequate processes in place to produce war reserve parts. This production schedule will support the FY 2006 First Production Unit (FPU).

W76 Life Extension Program	**100,237**	**146,363**	**213,111**

The W76 Life Extension Program will extend the life of the W76 for an additional 30 years with the FPU in FY 2007. R&D activities will include qualification and certification activities ensuring refurbished warheads meet all required military characteristics and Stockpile Management efforts will include work on the nuclear explosive package; the Arming, Fuzing, and Firing system; gas transfer system; and associated cables, elastomers, valves, pads, foam supports, tapered tapes, telemetries, and miscellaneous parts. In FY 2005, R&D efforts will complete engineering design of the nuclear explosive package primary subsystem components; conduct the final design and independent peer reviews; and design-flight test bodies for the follow-on commander-in-chief evaluation test (FCET-34). Stockpile Management efforts will ramp up activities in qualification system engineering; procure commercial off-the-shelf parts and associated production materials; design and fabricate tools and gauges; and, conduct process prove-in of production activities for major components including flight tests bodies.

W80 Life Extension Program	**116,774**	**144,702**	**146,400**

The W80 Life Extension Program extends the life of the W80 for an additional 20 years with the FPU in FY 2008. With the combination of W80 program rebaselining and the congressional direction included in the FY 2004 Energy and Water Development Appropriation Act, the W80 FPU has been adjusted to FY 2008, consistent with the Department of Defense schedules. R&D activities will include qualification & certification activities to ensure refurbished warheads meet all required military characteristics and Stockpile Management efforts will focus on replacing the neutron generator, trajectory sensing signal generator, gas transfer system, and other associated components. In FY 2005, R&D efforts will include high energy density experiments, full system engineering tests, system thermo-mechanical tests, captive carry flight tests, development of a joint test assembly (JTA-5) flight test unit; and, support for chemistry and material science. In FY 2005, Stockpile Management will prepare for component design and production; and, ramp up to full production focusing on process prove-in activities beginning with the warhead electrical system subassembly and cover, gas transfer system, cables, warhead interface module, environmental controls, and outer aluminum case.

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
W87 Life Extension Program	**116,665**	**66,305**	**0**

The W87 life extension program will be winding down activities in late FY 2004. As a result of Peacekeeper deactivation, discussions are ongoing within the joint DOE/DOD Strategic Capabilities Assessment to determine the final number of W87 required to support deployment on the Minuteman III.

B61 Stockpile Systems	**129,294**	**84,624**	**91,256**

Enduring stockpile workload efforts on all modifications of the B61 will include ongoing assessment and certification activities; cyclical limited life component exchange activities; surveillance activities; and any required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, activities include supporting the annual assessment process; conducting laboratory and production plant safety studies and implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and support of resolution of Significant Finding Investigations. R&D efforts include the following: submit data for surveillance cycle reports; conduct integrated experiments per current approved baseline plan; conduct development, design, and peer reviews on the spin rocket motor; and, support stockpile flight tests of the spin rocket motor. In FY 2005, Stockpile Management will include producing the 1M and 2M reservoirs; conducting pre-production engineering activities for the Alt 356/358/359 spin rocket motor; continuing surveillance tests for the B61-3/4/10 and the B61-7/11 (approximately 11 per family per year at present sampling quantities); disassembling and inspecting the stockpile laboratory tests units; and conducting component laboratory tests and stockpile flight tests for stockpile evaluation.

W62 Stockpile Systems	**24,139**	**18,062**	**18,401**

Enduring stockpile workload efforts on the W62 will include ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, activities include supporting the annual assessment process; conducting laboratory and production plant safety studies; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and support of resolution of Significant Finding Investigations. R&D efforts will focus on conducting material, component, and system level testing, analysis, and evaluation of performance and safety. Stockpile Management activities include continuing a normal cycle of surveillance tests plus additional targeted surveillance of aging components; and, conducting stockpile laboratory and flight tests, and disassembly and inspection of test units and test beds. Surveillance must be maintained through FY 2007 in preparation for the retirement of the W62 in FY 2009.

W76 Stockpile Systems	**92,250**	**138,019**	**137,527**

Enduring stockpile workload efforts on the W76 will include ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, specific activities include: supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century for rebuild activities at Pantex; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and support of resolution of Significant Finding Investigations. R&D activities include submitting data for surveillance cycle reports and conducting integrated experiments per current approved baseline plan;

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Stockpile Management activities include steady state production of the 1X Acorn; production of telemetry units and neutron generator monitors; production of unique structural parts and Acorns for joint test assemblies; building three joint test assemblies; conducting stockpile laboratory and flight tests; and, disassembling and inspecting test units.

W78 Stockpile Systems	**71,209**	**53,110**	**44,313**

Enduring stockpile workload efforts on the W78 will include ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, activities include supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the POG and DoD Safety Studies; and, support of resolution of Significant Finding Investigations. R&D activities include submitting data for surveillance cycle reports and conducting integrated experiments per current approved baseline plan. Stockpile Management activities include initiating production activities for the firing system; continuing to work on the improved LF-7 gas transfer system; conducting 3 stockpile flight tests using the redesigned W78 joint test assemblies; and, disassembly and inspection of stockpile laboratory and flight units and test beds.

W80 Stockpile Systems	**50,236**	**43,474**	**49,507**

Enduring stockpile workload efforts on the all modifications of the W80 include ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, specific activities include supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and support of resolution of Significant Finding Investigations. R&D activities include submitting data for surveillance cycle reports; and, conducting integrated experiments per current approved baseline plan. Stockpile Management activities include the stable production of the 1K reservoir; producing telemetry units, neutron generator monitors, cables, and other joint test assembly hardware for support of stockpile flight tests; continuing polymeric evaluation testing; building six joint test assemblies; and, conducting the disassembly and inspection of six stockpile laboratory and flight tests each and six test beds.

B83 Stockpile Systems	**59,943**	**57,703**	**44,995**

Enduring stockpile workload efforts on all modifications of the B83 include ongoing assessment and certification activities; limited life component exchange activities; surveillance activities; and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, specific activities include supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and, support of resolution of Significant Finding Investigations. R&D efforts will focus on conducting material, component, and system level testing and evaluating performance and safety characteristics. Stockpile Management efforts include surveillance of B83 detonators and pits in support of the annual certification effort;

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

accomplishing 11 stockpile laboratory and flight tests; completing the disassembly and inspection of stockpile laboratory and flight test units; and, rebuilding B83-1 Retrofit Evaluation System Test (REST) unit.

W84 Stockpile Systems	**7,513**	**4,145**	**6,119**

Enduring stockpile workload efforts on all modifications of the W84 include ongoing assessment and certification activities. In FY 2005, specific activities include: supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the Project Officer's Group and support of Significant Finding Investigation resolution. R&D efforts include conducting material, component and system level testing and, evaluating performance and safety characteristics. Stockpile Management efforts include support of the disassembly and inspection of some existing Joint Test Assembly (JTA) units. Although there is no delivery system for the W84, the DoD requires NNSA to maintain the W84 warhead readiness.

W87 Stockpile Systems	**76,392**	**88,902**	**94,884**

Enduring stockpile workload efforts on the W87 include ongoing assessment and certification activities, limited life component exchange activities; surveillance activities; and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, specific activities include: supporting the annual assessment process; conducting laboratory and production plant safety studies; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and, support of resolution of Significant Finding Investigations. R&D efforts include conducting material, component, and system level testing; evaluating performance and safety characteristics; and, developing a new W87 stockpile flight test vehicle. Stockpile Management efforts include producing environmental sensing devices, firing sets, and lightening arrestor connectors in support of surveillance rebuilds for the protected period; restarting production of other cables, valves, and mechanical piece parts; conducting disassemblies and inspections of eight stockpile laboratory test units, three stockpile flight test units, production of three joint test assemblies, and production of eight test beds; providing range support and data collection of W87 stockpile flight tests; and, continuing surveillance of W87 detonators.

W88 Stockpile Systems	**49,541**	**55,734**	**49,093**

Enduring stockpile workload efforts on the W88 include ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, and required alterations, modifications, repairs, safety studies, and military liaison work. In FY 2005, specific activities include: supporting the annual assessment process; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century; providing laboratory and management support to the Project Officer's Group and DoD Safety Studies; and, support of resolution of Significant Finding Investigations. R&D efforts include submitting data for surveillance cycle reports and, conducting integrated experiments per current approved baseline plan. Stockpile Management efforts include continuing forging procurements; initiating engineering development activities for the 4T and 1P reservoirs; and, disassembling and inspection of eight stockpile laboratory test units, five stockpile flight test units, production of five joint test assemblies, and several test beds.

(dollars in thousands)	FY 2003	FY 2004	FY 2005
Retired Warheads Stockpile Systems............................	**40,518**	**58,640**	**65,258**

Retired Warhead system workload focuses on dismantlement, characterization of components, disposal of retired warheads systems, and surveillance of selected components from the retired systems. Stockpile Management includes continuing the surveillance of retired stockpile warheads: conducting facility hazard assessments, including lightning, environmental sensing devices, and fire protection; issuing safety analysis reports; conducting laboratory and production plant safety studies in implementation of Seamless Safety for the 21st Century for newly retired systems; providing oversight for testers; and, supporting the Tri-lab office. Also included are workload activities on the B53, W56, B61-3/4, W68 Arming Fuzing and Firing (AF&F), W79 components, W62, MK4 AF&F, and workload processes unique to the storage and disposition of active weapons that have been dismantled as part of the Surveillance Program or are designated in excess.

Stockpile Services Research & Development Certification and Safety..	**139,810**	**156,196**	**157,986**

The Stockpile Services R&D Certification and Safety activities provide the core competencies and capabilities for R&D efforts not directly attributable to a single specific warhead system. Efforts span all systems and include conducting modeling and assessment, safety and surety, warheads effects and system analysis studies, and model-based engineering and manufacturing; preparing and performing hydrodynamic tests for specific stockpile questions; providing engineering and information infrastructure support, production liaison and oversight, multi-system surveillance, material science support, and interagency support; subsystems, and other components for use in multiple systems; and, archiving legacy and current knowledge pertaining to warheads. In FY 2005, R&D efforts include conducting development of gas transfer systems, technology for stockpile multi-use components, instrumentation, and ancillary equipment for future application in the stockpile; performing systems studies, technical safety exchanges, and program, complex, and campaign integration activities; integrating management, engineering business practices, information systems, and R&D program management; developing use control systems and joint test assemblies; and, supporting Pre-Phase 6.3 Studies.

Stockpile Services Management, Technology, and Production...	**98,111**	**111,129**	**133,101**

The Stockpile Services Stockpile Management, Technology, and Production category includes certain management and workload activities that cannot be meaningfully associated with a particular system and may ultimately serve multiple systems. Stockpile Management efforts in FY 2005 include maintaining technical knowledge, engineering practices, and information systems; conducting component engineering activities, reservoir forging development, Significant Finding Investigation activities, program management and integration, special stockpile studies, and independent assessments; integrating projects; conducting required training for stockpile systems; performing safety and use control assessments; providing payments resulting from court orders that were based upon manufacture of nuclear warheads components; and, conducting activities that develop, maintain, surveil stockpile multi-use components, instrumentation, ancillary equipment, and certain activities that cannot be associated with specific systems.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Stockpile Services Advanced Concepts Initiative	**0**	**6,000**	**9,000**

The Stockpile Services Advanced Concepts Initiative is used for reporting funding requirements of Pre-Phase 3/6.3 laboratory workload activities to potentially enhance the military capabilities of the stockpile, in coordination with the DoD. These activities include: developing advanced concepts which could be applied to the stockpile of the future, code development for system-specific nuclear effects, phenomenology, and exercise of design skills; conducting pre-conceptual, conceptual, feasibility, design and costing studies of options. Efforts also include participating on program panels; supporting the United States Strategic Command by supplying quick turnaround, limited scope answers to questions concerning feasibility; participating in the NNSA/DoD Nuclear Planning Group-2 study; conducting concept studies with the Air Force.

Stockpile Services Robust Nuclear Earth Penetrator..	**14,577**	**7,435**	**27,577**

The Stockpile Services Robust Nuclear Earth Penetrator (RNEP) category includes funding for the completion of the Phase 6.2/2A Air Force-led study. Activities include participating in integrated NNSA-DoD project teams for development of operational requirements; systems design and integration; development of data downselect packages; planning and cost analysis; phenomenology studies; and the executive joint study group. It also includes managing multi-laboratory independent review team activities, and preparing and conducting hardware demonstration tests for candidate designs. In FY 2005, subsystem tests and a full system test of the proposed design will be completed. All NNSA headquarters and laboratory activities for the RNEP study are coordinated with complementary activities by the Air Force's Air Combat Command and Air Armament Center in conjunction with the responsible directorate of the Air Staff (AF/XON).

Total, Directed Stockpile Work	**1,259,136**	**1,326,656**	**1,406,435**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **B61 Life Extension Program**	
The requested increase supports conducting the final design and peer reviews; ramping up qualification activities; producing surrogate material parts; completing preproduction activities; and, producing two process prove-in hardware lots and war reserve components in preparation for the increased level of activity required to meet the FY 2006 FPU..	+ 31,814
▪ **W76 Life Extension Program**	
This funding increase supports conducting final development, design, and peer reviews; procuring commercial off-the-shelf parts and associated materials; ramping up the qualification of systems engineering; designing and fabricating tooling and gauges; conducting process prove-in of production activities for major components; completing engineering design of nuclear explosive package primary subsystem components; and, building and delivering FCET-34 JTA to meet a FY 2007 FPU..	+ 66,748
▪ **W80 Life Extension Program**	
This increase supports a schedule to match Air Force acceptance schedules and supports the continued efforts to complete the final design and conduct peer reviews; issuing engineering releases; initiating process prove-in activities for production of the warheads electrical system subassembly and cover, gas transfer system, cables, warhead interface module, environmental controls, and outer aluminum case; and, producing the first delivery unit of the neutron generator to meet a FY 2008 FPU	+ 1,698
▪ **W87 Life Extension Program**	
Funding decrease reflects the delay in the W87 LEP pending decision and directions based on results of the NPR update...	- 66,305
▪ **B61 Stockpile Systems**	
This increase supports conducting Seamless Safety for the 21st Century activities; conducting development, design, and peer reviews for the spin rocket motor; commencing Alt 356/358/359 spin rocket motor pre-production engineering; and initiating stockpile flight tests.	+ 6,632
▪ **W62 Stockpile Systems**	
This increase supports the operation of an additional disassembly and inspection line	+ 339

	FY 2005 vs. FY 2004 ($000)
▪ **W76 Stockpile Systems**	
This funding decrease is based on planned closure of existing significant finding investigations in FY 2004	- 492
▪ **W78 Stockpile Systems**	
This funding decrease reflects a significant reduction in the production of neutron generators (NG) in accordance with the Master Nuclear Schedule volume III. This was achieved by successful age studies that enable the extension of life expiration dates for the neutron generators	- 8,797
▪ **W80 Stockpile Systems**	
This increase supports conducting Seamless Safety for the 21st Century activities for a full year	+ 6,033
▪ **B83 Stockpile Systems**	
Funding decrease due to completion of component characterization activities; change in production cost estimating; and, completion of Alt 355 and telemetry tester replacement	- 12,708
▪ **W84 Stockpile Systems**	
Funding increase supports completion of the Seamless Safety for the 21st Century activities and conduct of joint test assemblies, Disassembly and Inspections (D&Is) and lab tests to validate the system remains safe in all Air Force storage environments	+ 1,974
▪ **W87 Stockpile Systems**	
The requested increase in funding supports rebuild activities for the environmental sensing device, lightning arrestor cable, firing set, completion of new design joint test assemblies, and completing shelf-life units and surveillance units.	+ 5,982
▪ **W88 Stockpile Systems**	
This decrease reflects savings due to down selecting to one gas transfer system instead of continuing to develop the multiple systems in parallel for the GTS replacement. Also reflected is a funding decrease for completion of Seamless Safety for the 21st Century activities in early FY 2005 and the projected completion of activities to reduce the surveillance backlog in FY 2004.	- 6,641
▪ **Retired Warheads Stockpile Systems**	
The increase in funding supports dismantlement activities on the following systems: B53, W56, W79 components, W62, and MK4 AF&F, and storage and disposition of active weapons that have been dismantled as part of the Surveillance Program or are designated in excess.	+ 6,618

	FY 2005 vs. FY 2004 ($000)
▪ **Stockpile Services Research & Development**	
This increase reflects support for component testing which is partially offset by reduced stockpile specific experiment activity on the Omega Laser Facility, and reduced scope of work and a schedule delay on ACCORDION Prime subcritical experiments at the Nevada Test Site.	+ 1,790
▪ **Stockpile Services Stockpile Management, Technology, and Production**	
This increase reflects the court ordered payments to legacy workers for toxic material exposure; increasing support for special component removal and container studies and associated implementation efforts; conducting independent assessment of production plant capacities and capabilities necessary for increased production; producing neutron generator test equipment; procuring special materials to support new limited life component builds; realigning program management for increased emphasis on quality aspects and reactivation of production quality control processes; and reactivation of production quality control processes	+ 21,972
▪ **Stockpile Services Advanced Concepts Initiative**	
Funding increase reflects an anticipated increase in programmatic activities. Second full year of funding in this category for all laboratories	+ 3,000
▪ **Stockpile Services Robust Nuclear Earth Penetrator Research & Development**	
This increase in funding reflects the initiation of various developmental ground tests conducted on the candidate weapon designs in support of the Phase 6.2/6.2A option select	+ 20,122
Total Funding Change, Directed Stockpile Work	+ 79,779

Capital Operating Expenses and Construction Summary

Capital Operating Expenses[a]

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects..........................	8,012	8,252	8,500	+ 248	+ 3.0%
Capital Equipment	18,955	19,524	20,110	+ 586	+ 3.0%
Total, Capital Operating Expenses	26,967	27,776	28,610	+ 834	+ 3.0%

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

Science Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Science Campaign					
Primary Assessment Technology [a] ………..	63,619	82,260	81,473	- 787	- 1.0%
Dynamic Materials Properties	84,861	81,779	91,521	+ 9,742	+ 11.9%
Advanced Radiography	67,957	55,665	62,371	+ 6,706	+ 12.0%
Secondary Assessment Technologies.......	44,430	54,144	65,597	+ 11,453	+ 21.2%
Total, Science Campaign....................................	260,867	273,848	300,962	+ 27,114	+ 9.9%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Science Campaign						
Primary Assessment Technologies…….	81,473	79,484	79,364	79,662	84,804	404,787
Dynamic Materials Properties ………..	91,521	89,323	85,525	91,512	94,605	452,486
Advanced Radiography……..	62,371	57,263	66,035	69,496	71,461	326,626
Secondary Assessment Technologies…….	65,597	75,312	76,860	87,660	90,158	395,587
Total, Science Campaign...........	300,962	301,382	307,784	328,330	341,028	1,579,486

Description

The Science Campaign supports the Stockpile Stewardship mission of the National Nuclear Security Administration (NNSA) by achieving the following goals: continue the development of the knowledge, tools and methods to assess with confidence the safety, reliability and performance of the nuclear explosive package portion of weapons without further underground testing; develop new materials and technologies that are required to solve identified stockpile issues particularly for the nuclear explosive package; enhance the readiness of the NNSA to conduct underground nuclear testing as directed by the President; and develop and maintain essential scientific capabilities and infrastructure in nuclear weapons unique technologies.

[a] Starting in FY 2005 efforts related to maintaining the readiness of the Nevada Test Site to conduct underground nuclear tests, if directed, have been moved from the Readiness in Technical Base and Facilities Program Readiness activity to the Primary Assessment Technologies component of the Science Campaign. Comparability adjustments are reflected in the amounts of $17,940,000 in FY 2003, $24,744,000 in FY 2004, and $30,000,000 in FY 2005.

Benefits to Program Goal 01.28.00.00 Science Campaign

Within the Science campaign program, the Primary Assessment Technologies, Dynamic Material Properties, Advanced Radiography, and Secondary Assessment Technologies subprograms each make unique contributions to Program Goal 01.28.00.00. In conjunction with Advanced Simulation and Computing the Primary Assessment Technologies subprogram develops the tools, methods, and knowledge required to certify the nuclear safety and nuclear performance of any aged or rebuilt primary to required levels of accuracy without nuclear testing. The Dynamic Material Properties subprogram focuses on the development of accurate modeling for the properties and behavior of materials used within the nuclear explosives package. The Advanced Radiography subprogram develops technologies for three-dimensional imagery of imploding surrogate primaries with sufficient spatial and temporal resolution to experimentally validate computer simulations of the implosion process. The Secondary Assessment Technologies subprogram develops the tools, methods, and knowledge required to certify the nuclear performance of secondaries without nuclear testing.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Conduct further subsets of the subcritical experiment begun in FY 1999 (Oboe) and one additional subcritical experiment at the Nevada Test Site to provide data on the behavior of nuclear materials during the implosion phase of a nuclear weapon. (MET GOAL)	Meet FY 2001 milestones in the science campaigns to achieve scientific understanding of the nuclear package of weapon systems to sustain our ability to annually certify the nuclear weapon stockpile without underground nuclear testing. (MET GOAL)	Meet the FY 2002 milestones in the science campaign to achieve scientific understanding of the nuclear package of weapon systems to sustain our ability to annually certify the nuclear weapon stockpile without underground nuclear testing. (MET GOAL)	Meet the critical FY 2003 Campaign performance targets contained in the NNSA Future-Year Nuclear Security Program (FYNSP). (MIXED RESULTS)
Ensure that the capability to resume underground nuclear testing is maintained in accordance with the Presidential Decision Directive through a combined experimental and test readiness program. (MET GOAL)	There were no related targets.	There were no related targets.	Implement the recommendations requested by the Nuclear Posture Review to refine test scenarios and evaluate the cost/benefit tradeoffs to sustain optimum test readiness that best supports the New Triad. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Developments and improvements in the accuracy of predictive models and methodologies used to assess nuclear performance	Completed the first Joint Actinide Shock Physics Experimental Research (JASPER) Plutonium (Pu) shot demonstrating an ability to improve Pu equation of state (EOS) data.	Complete development of Quantitative Margins and Uncertainties (QMU) logic for the W76, incorporate logic in advanced simulation, and conduct peer review.	Complete development of QMU logic for the W88 and conduct peer review.	Deliver, to advanced simulations, experimental data in new pressure and temperature regimes from dynamic and static high-pressure experiments to guide the development on an improved Pu equation of state (EOS).	Deliver a preliminary multi-phase plutonium EOS with quantified uncertainties for incorporation in primary assessment models.	Review the state of the plutonium EOS database to determine further requirements for plutonium experiments and deliver experimental data in specific regimes of interest.	-Complete 100% of QMU work on the W76. -Complete 80% of the QMU work on the W88.	Ongoing

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Improved radiographic capabilities to support the assessment of nuclear performance, as required by the National Hydrodynamics Plan	Demonstrated containment of Beryllium in hydrotests at Lawrence Livermore National Laboratory Site 300 & the Dual-Axis Radiographic Hydrotest (DARHT) facility.	Complete 100% of the external technical review of required work on DARHT facility and plans for completion of DARHT Second Axis improvements.	Evaluate and schedule corrective actions for DARHT Second Axis.	-Implement DARHT Second Axis improvements. -Complete development of stockpile stewardship requirements for radiography experiments and conceptual plans for future facilities.	-Prepare mission need document for future radiography facility. -Execute first 2-axis hydro shot in support of stockpile assessment.	Obtain NNSA decision on need for a future radiography facility.	Prepare Conceptual Design Report on future radiography facility, if required.	Ongoing
Readiness to conduct underground nuclear testing as established by National Security policy and documented in the Program Plan for Test Readiness	-Began transition from 24- to 36-month readiness to 18-month readiness. -Completed resourced-loaded program implementation plan.	-Complete the Master Study for the Device Assembly Facility and implement the Technical Safety Requirements.	-Produce list of possible test scenarios and confirm that plans will enable these tests. -Complete the Timing and Firing Nuclear Explosive Safety Study (NESS). -Achieve 18-month (or currently required) readiness as confirmed by external review board.	-Produce list of possible test scenarios and confirm that plans will enable these tests. -Prepare plan for device-specific NESS.	-Produce list of possible test scenarios and confirm that plans will enable these tests. -Provide capability to produce THREX test diagnostics.	-Produce list of possible test scenarios and confirm that plans will enable these tests. -Conduct external review to confirm maintenance of 18-month (or currently required) readiness.	Produce list of possible test scenarios and confirm that plans will enable these tests.	Ongoing

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Documented National Hydrodynamics Plan, with peer review, to support the assessment of nuclear performance	Completed development of coordinated plan of hydrodynamic experiments.	Execute the planned hydrodynamic experiments on DARHT and Container Firing Facility (CFF)/Flash X-Ray (FXR) at Los Alamos and Lawrence Livermore National Laboratories (LANL & LLNL).	Execute the planned hydrodynamic experiments on DARHT and CFF/FXR at LANL & LLNL.	Execute the planned hydrodynamic experiments on DARHT and CFF/FXR at LANL & LLNL.	Execute the planned hydrodynamic experiments on DARHT and CFF/FXR at LANL & LLNL.	Execute the planned hydrodynamic experiments on DARHT and CFF/FXR at LANL & LLNL.	Execute the planned hydrodynamic experiments on DARHT and CFF/FXR at LANL & LLNL.	Ongoing
Reduced cost of obtaining plutonium experimental data on the Joint Actinide Shock Physics Experimental Research (JASPER) facility to support primary certification models (EFFICIENCY MEASURE)	N/A	Establish the baseline cost for JASPER experiments.	Reduce the costs of similar JASPER shots to 90% of the baseline costs.	Reduce the costs of similar JASPER shots to 85% of the baseline costs.	Reduce the costs of similar JASPER shots to 80% of the baseline costs.	Maintain the costs of similar JASPER shots at 80% of the baseline costs.	Maintain the costs of similar JASPER shots at 80% of the baseline costs.	Ongoing

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Primary Assessment Technologies	**63,619**	**82,260**	**81,473**

The primary assessment technologies activity, formerly the Primary Certification Campaign, develops the tools, methods, and knowledge required to certify the nuclear safety and nuclear performance of any aged or rebuilt primary to required levels of accuracy without nuclear testing. As part of this effort, an assessment will be conducted on the accuracy of primary predictions in the W76 and W88 programs.

Principal focus areas of this activity include the development of a better understanding of boost physics and the quantitative role of radiography in primary assessment technologies. This work is closely integrated with and dependent on Advanced Simulation and Computing and is a prerequisite for completing requirements studies for an advanced radiography capability. A majority of the experimental effort is in hydro testing, subcritical experiments, materials science, and dynamic system behavior. The assessment component in this activity examines the effects of improved materials models on primary certification and provides uncertainty guidance. Areas under investigation include: plutonium equation-of-state (EOS) data, thermo-chemically based EOS, plutonium ejecta data from subcritical experiments at the Nevada Test Site, and an interim high explosives model.

Primary Assessment Technologies support Lawrence Livermore National Laboratory (LLNL) experiments at the U1a Complex and JASPER at NTS to create conditions of dynamic high pressure and temperature to enable investigations of the dynamic response of plutonium under shock loading Advanced Simulation and Computing supplies analysis to identify most critical data needs and incorporated new data into simulation. Sandia National Laboratories continues development of compact radiography sources for use at the U1a Complex. This work complements the advanced compact radiography technology work conducted at LLNL. Experiments at Omega are laying the groundwork for a phased set of experiments on NIF that will provide data on material properties at very high pressures. Advanced diagnostics development work is underway to address known deficiencies in essential test capabilities and to examine issues recently highlighted through stockpile surveillance. Also supported is shaped-charge work to validate performance codes on dynamics with high explosives.

In FY 2005, the efforts related to maintaining the readiness of the Nevada Test Site (NTS) to conduct underground nuclear tests, if directed, have been moved to this activity from the Readiness in Technical Base and Facilities (RTBF) Program Readiness activity. The request includes $30 million for this effort with $24.7 million in FY 2004 and $17.9 million in FY 2003. Funding supports activities that are unique to test readiness such as archiving, authorization bases, resumption planning, standby assets, nuclear skills retention, diagnostic refinements and field test neutron generators.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Dynamic Materials Properties.......................................	**84,861**	**81,779**	**91,521**

This activity provides physics-based, well-validated, predictive descriptions and experimental data required to guide and benchmark the development of models for all stockpile materials at the level of accuracy required by the Primary and Secondary Assessment activities, Directed Stockpile Work (DSW) programs, and Advanced Simulation and Computing (ASC) Campaign. The measurement of fundamental materials properties is essential to establish confidence in the materials models used in next generation codes to provide predictive relationships between materials processing and properties and stockpile performance, safety, and reliability.

More specifically, the activity provides predictive descriptions and experimental data for thermodynamic properties such as equation-of-state (EOS) and dynamic mechanical constitutive properties including strength and plasticity, failure, spall, and ejecta under the extreme conditions of interest for weapons. In addition, this activity will investigate the properties of energetic materials, as well as the electronic and optical properties of materials needed for the stockpile. This activity also holds the responsibility for the characterization of materials to enable the assessment of effects on material performance resulting from any process changes or optimization. The latter involves developing a scientific understanding of the inter-relationship of processing, properties, and performance of key stockpile materials.

The focus of this activity in FY 2005 includes EOS and constitutive property determinations and delivery of an improved data set for plutonium, improvements in the diagnostics suite on JASPER, the qualification of a replacement PBX 9501 explosive, and validation of a process model supporting neutron generator production. Experiments at a broad range of facilities are supported, such as subcritical experiments at the Nevada Test Site's U1a Complex underground test facility, experiments on dynamic materials properties at the Atlas Facility, and plutonium experiments at the Joint Actinide Shock Physics Experimental Research Facility (JASPER). At the Los Alamos Neutron Science Center (LANSCE), nuclear physics and materials properties experiments are supported, and experiments studying material response at high-pressure are executed at the Sandia pulsed power Z-facility.

To ensure future stewardship viability, this activity supports a vigorous university partnership program in experimental science of broad relevance to stockpile stewardship. DOE/NNSA realizes the importance of university partnerships to maintain the long term intellectual viability of the NNSA laboratories complex.

Advanced Radiography	**67,957**	**55,665**	**62,371**

Radiographic analysis in conjunction with Advanced Simulation and Computing will enable extraction of quantitative radiographic data to improve the link between radiographic images and the assessment of primary performance. This effort is required to support the certification goals of the primary assessment technologies activity. An Advanced Materials Project effort will develop and implement a plan for materials and demonstrate an initial processing capability for those materials at LLNL.

Work continues at LLNL to develop a compact radiography source to support advanced U1a Complex subcritical experiments. Proton radiography at the Los Alamos Neutron Science Center (LANSCE) Area C and Brookhaven Laboratory Attenuating Gradient Synchrotron (AGS) provides valuable data for stockpile assessment and certification. Proton radiography experiments are being conducted at LANSCE to develop techniques for studying the surface spall that occurs in shocked weapon materials.

While the principal near-term focus of this campaign is on x-ray radiographic capabilities, for the longer-term a modest effort to explore and develop proton radiography technologies is being conducted. No funding is requested for hardware development that could be used for a proton based Advanced Hydro Facility.

In FY 2005-2006, the focus of this activity is on the commissioning of the Dual-Axis Radiographic Hydrotest (DARHT) facility including the development of solutions to high voltage breakdown problems on the 2nd axis discovered during early commissioning experiments. Optimization includes improving beam spot size and detector developments to improve radiographic image resolution, installation and activation of the second axis beamline hardware and the multi-pulse target assembly. Supporting work includes the development of a composite vessel technology to mitigate the environmental consequences of hydrotests.

Commissioning of the second axis will support hydrotesting for the W76 and B61 DSW efforts and the Dynex experiment for W88 pit certification. Optimization of the LLNL Contained Firing Facility (CFF) Flash X-ray Accelerator (FXR) is also included in this activity.

The two axes of DARHT will provide a capability for achieving the long-term campaign goal of three-dimensional imagery of imploding surrogate primaries with sufficient spatial and temporal resolution to experimentally validate computer simulations of the implosion process.

Secondary Assessment Technologies............................	**44,430**	**54,144**	**65,597**

The secondary assessment technologies activity, formerly the Secondary Certification and Nuclear Systems Margins Campaign, provides modern scientific tools, methods, and knowledge required to certify the performance of nuclear secondaries. In a fundamental way, the effort is focused on developing a predictive capability and advanced simulation for the performance of the nuclear system as a whole. This effort is developing and utilizing a methodology called “Quantification of Margins and Uncertainties” which will be used to support assessment and certification in the future.

This activity is based on the use of low-energy-density (hydrodynamic) and high-energy-density aboveground experiments, as well as past nuclear test data to validate modern 3-dimensional design codes. Increasingly, experiments on high energy density physics facilities, including the National Ignition Facility (NIF), Omega, and Z machine, are used to validate these codes and develop improved models of physical properties and processes at the extreme physics regimes relevant to the goals of this activity. FY 2005 will be the first opportunity for conducting secondary relevant experiments with the NIF.

(dollars in thousands)

Emphasis in FY 2005 will be placed on radiation case performance and radiation flow phenomena. Complex integrated experiments that validate radiation flow will be executed. Techniques developed will support both near-term DSW activities and long-term stockpile assessment needs.

Another FY 2005 area of emphasis is the development of advanced target fabrication and diagnostic techniques required to support ongoing and planned experiments at Omega, Z machine, and NIF employing advanced materials and detailed features. Advanced diagnostics and target fabrication capabilities are the key to the fielding of increasingly sophisticated experiments on these facilities.

Since secondary performance is essential to the production of a militarily effective output from modern nuclear systems, this activity is also evolving in FY 2005 to add experimental and computational activities that support development of a validated, predictive computational capability for overall weapon yield performance.

	FY 2003	FY 2004	FY 2005
Total, Science Campaign..	**260,867**	**273,848**	**300,962**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Primary Assessment Technology**	
This decrease reflects a shift in emphasis from subcritical experiments to support LLNL activities to increased reliance on Joint Actinide Shock Physics Experimental Research (JASPER) facility experiments to obtain plutonium data	- 787
▪ **Dynamic Materials Properties**	
Increased funding provides experimental support for JASPER and Atlas, as well as the University programs in high-energy-density physics and high-pressure materials science	+ 9,742
▪ **Advanced Radiography**	
Increase in funding provides funding required to continue the DARHT 2nd axis commissioning to solve high voltage as well as to partially restore funds for proton radiography experiments	+ 6,706
▪ **Secondary Assessment Technology**	
Increase reflects an expanded experimental agenda needed to acquire data supporting the Quantification of Margins and Uncertainties (QMU). Efforts also include upgrading target fabrication capabilities to support high-energy-density physics and radiation flow experiments on National Ignition Facility and pulsed power facilities, and enhanced diagnostic support facilities at Nevada to increase the accuracy and precision of quantitative diagnostics. NIF first becomes available to support these campaign related experiments in FY 2005........	+ 11,453
Total Funding Change, Science Campaign	+ 27,114

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects........	0	0	0	0	N/A
Capital Equipment........	10,751	11,073	11,405	+ 332	+ 3.0%
Total, Capital Operating Expenses	10,751	11,073	11,405	+ 332	+ 3.0%

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

Engineering Campaign

Funding Schedule by Activity [a]

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Engineering Campaign					
Enhanced Surety	31,588	32,781	38,121	+ 5,340	+ 16.3%
Weapons Systems Engineering Assessment Technology	25,814	27,079	27,270	+ 191	+ 0.7%
Nuclear Survivability	22,521	22,843	24,460	+ 1,617	+ 7.1%
Enhanced Surveillance	74,097	91,252	99,879	+ 8,627	+ 9.5%
Microsystems and Engineering Sciences (MESA) Other Project Costs (OPC)	4,200	4,473	4,600	+ 127	+ 2.8%
Microsystems and Engineering Sciences Application (MESA) Construction	112,282	86,487	48,654	- 37 833	- 43.7%
Total, Engineering Campaign	270,502	264,915	242,984	- 21,931	- 8.3%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Engineering Campaign						
Enhanced Surety	38,121	40,039	45,824	48,606	50,091	222,681
Weapons Systems Engineering Assessment Technology	27,270	27,898	30,463	32,259	33,182	151,072
Nuclear Survivability	24,460	24,217	25,700	27,515	28,555	130,447
Enhanced Surveillance	99,879	105,738	112,511	116,537	119,806	554,471
MESA OPCs	4,600	4,751	4,859	5,059	5,204	24,473
MESA Construction	48,654	65,564	7,000	54,044	0	175,262
Total, Engineering Campaign	242,984	268,207	226,357	284,020	236,838	1,258,406

[a] FY 2003 and FY 2004 reflect comparability adjustments of $71,581,000 and $77,461,000, respectively moving Advanced Design and Production Technologies from Engineering Campaign to Readiness Campaign.

Description

The Engineering Campaign provides validated engineering sciences and engineering modeling and simulation tools for design, qualification, assessment, and certification; improved surety technologies, improved radiation hardened design and modeling capabilities; improved microsystems and microtechnologies; component and material lifetime assessments; and predictive modeling capabilities and diagnostics to identify emerging aging concerns.

Benefits to Program Goal 01.29.00.00 Engineering Campaigns

Within the Engineering Campaign program, the Enhanced Surety, Weapons Systems Engineering Assessment Technology, Nuclear Survivability, Enhanced Surveillance, and Microsystems and Engineering Sciences Application (MESA) Complex subprograms each make unique contributions to Program Goal 01.29.00.00. Enhanced Surety demonstrates enhanced use-denial and advanced initiation options for the entire stockpile. Weapons Systems Engineering Assessment Technology (1) establishes a science-based engineering certification methodology and required underlying engineering research and (2) conducts experiments and provides data necessary to develop and validate engineering computational models. Nuclear Survivability develops radiation-hardening approaches and hardened components, develops and validates experimental and analytical tools for qualifying warheads to nuclear survivability requirements, modernizes tools for weapon outputs, and develops and validates tools to translate military effects requirements to warhead design specifications (design-to-effects). Enhanced Surveillance provides component and material lifetime assessments and develops predictive capabilities for early identification of stockpile aging concerns. The Microsystems and Engineering Sciences Application (MESA) Complex is being developed to incorporate modern, survivable, electrical, optical and mechanical control systems into the stockpile where required.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of construction of the Microsystem and Engineering Science Application (MESA) facility, as documented in the Engineering Campaign Program Plan.	Completed 22% of MESA construction.	Complete 35% of MESA construction.	Complete 50% of MESA construction.	Complete 65% of MESA construction.	Complete 75% of MESA construction.	Complete 90% of MESA construction.	Complete 100% of MESA construction.	Complete 100% of construction FY 2009
Cumulative percentage of progress towards developing all improved surety improvements for the Life Extension Programs having Phase 6.3 beginning in FY 2010 or later, as documented in the Engineering Campaign Program Plan.	Completed 40% of the surety improvements.	Complete 50% of the surety improvements.	Complete 60% of the surety improvements.	Complete 70% of the surety improvements.	Complete 80% of the surety improvements.	Complete 90% of the surety improvements.	Complete 100% of the surety improvements.	Complete 100% FY 2009
Cumulative percentage of delivery of lifetime assessment, predictive aging models, and surveillance diagnostics toward the goal, as documented in the Engineering Campaign Program Plan.	Delivered the initial 7% of the assessments, aging models, and surveillance diagnostics.	Deliver 14% of the assessments, aging models, and surveillance diagnostics.	Deliver 23% of the assessments, aging models, and surveillance diagnostics.	Deliver 33% of the assessments, aging models, and surveillance diagnostics.	Deliver 43% of the assessments, aging models, and surveillance diagnostics.	Deliver 11% (total 54%) of the assessments, aging models, and surveillance diagnostics.	Deliver 65% of the assessments, aging models, and surveillance diagnostics.	Deliver 100% FY 2012 (Initial task)
Cumulative percentage of completed data sets used in developing tools & technologies to validate structural & thermal models with well-defined ranges of applicability & quantified uncertainties in accordance with the Engineering Campaign Program Plan.	Completed 10% of the scheduled data sets.	Complete 27% of the scheduled data sets.	Complete 55% of the scheduled data sets.	Complete 68% of the scheduled data sets.	Complete 78% of the scheduled data sets.	Complete 93% of the scheduled data sets.	Complete 100% of the scheduled data sets.	Complete 100% of 47 data sets FY 2009 (Initial Task)
Cumulative percentage of progress towards meeting goals identified in the Nuclear Survivability Annex of the Engineering Campaign Program Plan and effectiveness tools & technologies (EFFICIENCY MEASURE)	Completed 10% toward meeting appropriate goals.	Complete 20% toward meeting appropriate goals.	Complete 30% toward meeting appropriate goals.	Complete 40% toward meeting appropriate goals.	Complete 50% toward meeting appropriate goals.	Complete 60% toward meeting appropriate goals.	Complete 70% toward meeting appropriate goals.	Complete 100% towards goals FY 2012

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Enhanced Surety	**31,588**	**32,781**	**38,121**

Demonstrates enhanced use-denial and advanced initiation options for the entire stockpile directly supporting the first NNSA goal to ensure the safety, security, and control of the enduring nuclear weapons stockpile. This activity provides validated technology for inclusion in the stockpile refurbishment program to assure that modern nuclear safety standards are fully met and a new level of use-denial performance is achieved. A multi-technology approach is pursued to develop options for possible selection by weapon system designers during scheduled life extension programs (LEP) or other refurbishments. This multi-technology development also opens the design space and results in synergistic improvements in other weapon components

A joint program between laboratories includes the development of a laser fired optical initiation system for the W78 and future Navy Submarine-Launched Ballistic Missile warheads that offers significant improvements in safety by eliminating the possibility of any naturally occurring stimuli (such as lightning) from causing the weapon to initiate, while providing important use control features as well. In FY 2005, the completion of the development of a fiber optic controlled detonator is planned.

In FY 2005, a two-pronged effort in the development of advanced initiation technologies focused at improving safety at the detonator interface to the nuclear explosive package will take place. The first involves the development of an insensitive high explosive booster for stockpile weapons, coupled with a new compact initiator stronglink. The second effort involves the development of miniature, high energy density components.

Weapons Systems Engineering Assessment Technology (Formerly Weapons Systems Engineering Certification)	**25,814**	**27,079**	**27,270**

The Weapons Systems Engineering Assessment Technology activity has two major technical elements: (1) establishing a science-based engineering certification methodology and defining required underlying engineering research; and (2) conducting experiments and providing data necessary to develop and validate engineering computational models in collaboration with Advanced Simulation and Computing. These computational models are used to predict weapon system response to three Stockpile to Target Sequence (STS) environments: normal, abnormal and hostile. The activity also supports manufacturing development of critical components and subsystems; e.g., neutron generators, gas transfer systems, and microsystems. The campaign's objective is to establish the capability to predict engineering margins by integrating numerical simulations with experimental data. Validated computational tools are required to explore the operational parameter space of the nuclear weapons stockpile. Exploration of operational parameter space identifies failure modes and boundaries, thus, establishing engineering margins.

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

In FY 2005, non-intrusive instrumentation and telemetry systems to monitor non-fissile primary component response during primary detonation will be developed and component tested.

A High Explosive Radio Telemetry (HERT)-instrumented Enhanced Fidelity Instrumentation (EFI)-B-1 flight test unit in support of test FCET-34 is planned. The data and capability to assess the response of explosives in abnormal and hostile environments will be developed with work ranging from material response experiments to weapon system level experiments. Assessments will be made of the response of a Chemical High Explosive (CHE) system to combined abnormal environments.

Weapon qualification and certification efforts support: (1) establishing component design requirements for hostile impulse events for with application to the W76 Life Extension Program (2) conducting validation experiments for two manufacturing processes (neutron tube encapsulation and laser welding) and (3) achieving fully-operational status of the Thermal Test Complex in support of weapon system abnormal thermal environment qualification, and of the Aerial Cable Facility in support of weapon system alteration qualification.

Nuclear Survivability	**22,521**	**22,843**	**24,460**

The Nuclear Survivability activity develops and validates tools needed to design and qualify nuclear warheads that meet requirements for nuclear survivability and effectiveness. It develops radiation-hardening approaches and hardened components, develops and validates experimental and analytical tools for qualifying warheads to nuclear survivability requirements, modernizes tools for weapon outputs, and develops and validates tools to translate military effects requirements to warhead design specifications (design-to-effects) and to assess and optimize the effectiveness of warhead designs without underground nuclear tests

The nuclear survivability capabilities developed in this activity are driven by the need to improve tools to support near term limited life component replacements, life extension activities, and the long-term stewardship of the stockpile.

Specific efforts in FY 2005 will include developing validated computational tools to re-evaluate the threat posed by nuclear weapon radiation environments and system radiation responses with initial applications of nuclear survivability assessment technologies supporting qualification of replacement limited life components (LLCs) and the life extension program activities.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Enhanced Surveillance	**74,097**	**91,252**	**99,879**

The Enhanced Surveillance activity provides component and material lifetime assessments and develops predictive capabilities for early identification and assessment of stockpile aging concerns. The activity identifies aging issues with sufficient lead-time to ensure that NNSA can have the refurbishment capability and capacity in place when required. The strategy provides more robust stockpile surveillance for early problem identification, since any future problems would have a greater relative impact on the effectiveness of a smaller nuclear deterrent. The activity works with DSW to deploy new diagnostic tests that enable surveillance to be more predictive in finding defects in weapons sampled from the stockpile. The activity investigates the aging mechanisms in weapons and develops aging models to predict lifetimes of components and materials. The lifetime assessments also support planning for the NNSA facilities and infrastructure needed to replace aging components. The activity contributes current weapon aging information for completing the Annual Assessment Reports to certify to the President that the stockpile is safe and reliable.

As a specific example, Canned Sub-Assemblies (CSAs) lifetime assessments include efforts to develop understanding of the basic aging mechanisms and interactions of CSA materials, accelerated aging experiments to obtain data beyond that obtained by traditional stockpile surveillance, and thermochemical modeling of aging processes. The experiments are also used to validate broader age-aware models that are developed to support CSA lifetime assessments and predictions. This includes assessments of the future behavior of replacements used in the refurbishment of CSAs during the Life Extension Programs (LEPs). The CSA diagnostic projects provide automated techniques for detection and quantification of hydride corrosion and non-destructive evaluation of CSA aging processes.

Specific efforts in FY 2005 include: characterize naturally aged stockpile pits and accelerated pit aging samples to support a key milestone for pit lifetime assessment in FY 2006; install upgraded resolution for x-ray computed tomography of pits; complete lifetime assessments of selected Canned Sub-Assemblies and non-nuclear components; deliver advanced diagnostics and telemetry to support flight test requirements; deploy the first of five modernized system testers at the Weapons Evaluation Test Laboratory; develop new surveillance techniques for tritium reservoirs; conduct aging studies for high explosives, boosters, and detonators; provide a performance assessment model for the warhead electrical systems; and complete the stockpile aging assessment report to support the Annual Assessment Reports.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Microsystems and Engineering Sciences Application (MESA) Other Project Costs	**4,200**	**4,473**	**4,600**

The Microsystems and Engineering Sciences Application (MESA) Complex is being developed to incorporate modern, survivable, electrical, optical and mechanical control systems into the stockpile where required. These Microsystems are critical for improving the safety, security, and reliability of the stockpile during the life extension program refurbishment activities. Space inside the existing warheads is very limited. Tiny sensors, microcomputers, micromachines, and integrated Microsystems are a vital part of the modernization strategy to ensure that the U.S. nuclear weapons stockpile remains safe, secure, and reliable as possible. Operating funds are required to support other project costs (OPCs) that are related to the proposed MESA line-item construction project but are not capitalized. FY 2005 OPCs will include, but are not limited to: environmental, safety and health activities, the safety assessment and operational support costs during construction.

Microsystems and Engineering Sciences Application (MESA) Construction (01-D-108).................................	**112,282**	**86,487**	**48,654**

The Microsystems and Engineering Sciences Applications Complex at Sandia National Laboratories (SNL) in Albuquerque will provide for the design, integration, prototyping and fabrication, and qualification of microsystems into weapon components, subsystems and systems within the stockpile. The Performance Baseline for MESA was established on October 8, 2002. A baseline change to reflect the Congressionally appropriated funding increase in FY 2003 was approved on May 8, 2003, at the same time as Critical Decision 3, Approval to Start Construction. The funding reflects the approved MESA project baseline for each of the years presented. An additional baseline change will be required to incorporate the additional $25.2 million appropriated in FY 2004, though the funding requested in FY 2005 and the outyear funding profile does reflect a shift in recognition of the FY 2003 and FY 2004 increases.

Total, Engineering Campaign..	**270,502**	**264,915**	**242,984**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Enhanced Surety**	
Increase is required to develop and evaluate certain new and innovative delay and denial technologies to enhance nuclear weapon protection. Security and use control features will be integrated into a system that will provide progressively more severe penalties to reduce the likelihood of deliberate unauthorized use. The funding will also enable pre-certification testing of advanced detonator concepts, some of which was deferred from FY 2004, and activity to demonstrate integrated use denial concepts for possible use in future life extension programs	+ 5,340
▪ **Nuclear Survivability**	
Increase is due to inflation, no significant increase in new work scope.	+ 1,617
▪ **Enhanced Surveillance**	
The increase provides additional predictive surveillance diagnostic techniques to find problems earlier in aging pits, Canned Sub-Assemblies, tritium reservoirs, and non-nuclear components and materials. The increase supports advanced flight test technology using miniaturized instrumentation and higher fidelity configurations to find stockpile problems that are otherwise difficult to detect. The funding will also enable experiments and modeling needed to understand aging impacts on the lifetimes of additional high priority component and material types that have yet to be sufficiently assessed	+ 8,627
▪ **Engineering Campaigns: Microsystems and Engineering Sciences Application (MESA) Other Project Costs**	
Increase is consistent with the MESA Project baseline established in May 2003	+ 127
▪ **Engineering Campaigns: Microsystems and Engineering Sciences Application (MESA) Construction**	
Decrease shows funding profile adjustments to reflect reduced risk as a result of improved bidding environment for the Micro Fab and Micro Lab construction contracts. MESA project will not be significantly affected. Adjustments will be made by shifting tool procurements to later in the project	- 37,833
Total Funding Change, Engineering Campaign	- 21,931

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	175	181	186	+ 5	+ 3.0%
Capital Equipment	4,114	4,237	4,364	+ 127	+ 3.0%
Total, Capital Operating Expenses	4,289	4,418	4,550	+ 132	+ 3.0%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Unappro-priated Balance
Engineering Campaign: Microsystems and Engineering Sciences Application (MESA) Construction	462,469	87,925	112,282	86,487	48,654	126,608
Total, Construction			112,282	86,487	48,654	

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

01-D-108, Microsystems and Engineering Sciences Applications (MESA) Complex, Sandia National Laboratories, Albuquerque, New Mexico

Significant Changes

- The FY 2004 Energy and Water Development Appropriations Act, P.L. 108-137, which was enacted December 1, 2003, provided $87,000,000 for MESA, an increase of $25,200,000 above the request. A baseline change will be required to incorporate the schedule impacts of this additional funding, though this data sheet does reflect a shift in the funding profile in recognition of the FY 2003 and FY 2004 increases.

- The FY 2003 Omnibus Appropriations Act provided $113,000,000 for MESA, an increase of $38,000,000 above the request. The appropriation was reduced by $718,000 for a rescission enacted by P.L. 108-7. The additional funding provided in FY 2003 is being used to accelerate the construction of the Microsystems Laboratory (MicroLab) and Weapons Integration Facility (WIF). The Performance Baseline still reflects construction of the three MESA facilities in a sequenced approach based on NNSA mission priority:

  - The Microsystems Fabrication Facility (MicroFab), with required tooling, is the first priority because it will partially replace the outdated Compound Semiconductor Research Laboratory (CSRL) and provide transition space for prototyping new devices.

  - The MicroLab, will complete the replacement of the CSRL and will be used to conduct research critical to the development of microsystems components as well as rapid prototyping and testing of these components.

  - The WIF provides both classified and unclassified facilities that will facilitate design, system integration, and qualification of weapons systems. Unclassified workspaces will encourage and provide the environment necessary for process development and two-way information transfer between partners in industry and academia.

  The sequenced approach to bring the MESA Complex on line meets NNSA's priority mission requirements while at the same time being affordable within the confines of the NNSA Future-Years Nuclear Security Program (FYNSP).

  The impact of the additional FY 2003 funding on the construction schedule for MESA is as follows:

MESA Facility	Start of Construction	Revised Start of Construction	Start of Operations	Revised Start of Operations
MicroFab	3Q FY 2003	3Q FY 2003	3Q FY 2007	3Q FY 2007
MicroLab	2Q FY 2005	4Q FY 2003	1Q FY 2009	4Q FY 2007
WIF	3Q FY 2008	1Q FY 2007	3Q FY 2011	3Q FY 2010

- Critical Decision 3, Approval to Start Construction, was approved on May 8, 2003, for the remaining scope of work for MESA. The remaining scope includes construction of the Microsystems Fabrication Facility, Microsystems Laboratory, and Weapons Integration Facility, and the tooling procurement for the Microsystems Fabrication Facility. Work already approved, and completed or in progress, includes: site utilities; systems upgrades to the support infrastructure in the existing Microelectronics Development Laboratory (MDL); and retooling of the MDL for radiation hardened integrated circuit production and tooling for early critical microsystems research and development.

- MESA Project Engineering and Design activities were completed under budget by $30,827. The project's TEC and TPC have been reduced by this amount.

1. Construction Schedule History

	Fiscal Quarter					
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000)	Total Project Cost ($000)
FY 2002 Budget Request *(Preliminary Estimate)*…………….	N/A	N/A	2Q 2002	TBD	51,000 [a]	51,000
FY 2001 Congressional Budget Supplemental………………………	N/A	N/A	2Q 2002	TBD	68,000 [b]	68,000
FY 2003 Budget Request *(Preliminary Estimate)*……………	2Q 2001	1Q 2003	3Q 2003 [c]	4Q 2009	453,000	504,000
FY 2004 Budget Request *(Performance Baseline)* [d] ……….	2Q 2001	1Q 2003	3Q 2003 [c]	3Q 2011	462,500	518,500
FY 2005 Budget Request [d] *(Performance Baseline)*…………..	2Q 2001	1Q 2003	3Q 2003 [c]	3Q 2010	462,469	518,469

[a] Preliminary estimate for the MDL retooling only.

[b] Preliminary estimate for the infrastructure upgrades appropriated in 01-D-103, and transferred to this line item by the FY 2001 Supplemental ($17,000,000), and the preliminary estimate for the MDL Rad-Hard IC Retooling ($51,000,000).

[c] Construction of the new facilities included in the scope of this project starts in the 3Q FY 2003. Construction of site utilities and systems upgrades began in the 2Q FY 2002.

[d] The Performance Baseline was established on October 8, 2002.

[e] The PED portion of the project, which was funded under 01-D-103, was completed under budget by $30,827. The TEC and TPC for the project have been reduced by this amount.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2001	10,456	10,456	6,673
2002	4,469	4,469	7,426
2003	0	0	826
Construction			
2001	9,500	9,500	0
2002	63,500 [b]	63,500	32,798
2003	112,282 [c]	112,282	48,564
2004	87,000 [d]	87,000	95,000
2005	48,654	48,654	70,000
2006	65,564	65,564	102,827
2007	7,000	7,000	36,000
2008	54,044	54,044	62,355

3. Project Description, Justification and Scope

Project Description

The Microsystems and Engineering Sciences Applications (MESA) Complex at Sandia National Laboratories (Sandia) in Albuquerque, is a proposed state-of-the-art national complex that will provide for the design, integration, prototyping and fabrication, and qualification of microsystems into weapon components, subsystems, and systems within the stockpile.

The MESA Project will respond to mission needs by providing needed capabilities to:

- Enable integrated teams of weapon system designers, subsystem designers, analysts, and microsystems scientists and technologists to work effectively and efficiently to design, integrate, and qualify for weapon use microsystems-based components and weapons subsystems and ensure their incorporation into weapon systems assemblies;

[a] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

[b] Original appropriation of $67,000,000 was reduced by $3,500,000 as part of the Weapons Activities general reduction.

[c] Original appropriation was $113,000,000. This was reduced by $718,000 for a rescission and by $2,562,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $2,562,000 by a reprogramming.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

- Provide facilities and tooling to support radiation-hardened integrated circuit production and qualification in the event the United States loses the last remaining vendor;
- Conduct R&D, rapid prototyping, pre-production fabrication and analysis, and a war reserve microsystem production capability "of last resort" for DOE/NNSA and the Nuclear Weapons Complex;
- Develop and use predictive codes (characterized by high-performance, nonlinear, full-system, multi-physics models) for microscale physics and for the necessary integration with macroscale codes;
- Develop and use computational tools and capabilities (including visualization-design labs) to support microsystems design, simulation, and manufacturing; weapons performance assessments; renewal process analyses; and qualification of microsystems components, integrated subsystems, and the certification of the overall weapon system;
- Allow technology developers to contribute to both classified stewardship problems and unclassified R&D collaborations with partners in industry and academia; and
- Incorporate cost-effective recycle and reclaim systems that significantly reduce annual water use and result in other secondary benefits including reduced utility costs and bulk chemical storage.

Justification

Management of the stockpile focuses on the surveillance, maintenance, refurbishment, assessment, and certification activities necessary to extend the life of the current stockpile. As weapons approach, or exceed, their useful (warranted) lifetimes, their limited-life components require periodic refurbishment, retrofit and remanufacture. These activities are driven by the Life Extension Program (LEP), an evaluation and prioritization framework for performing systematic, life-extension upgrades on, and replacements of, subsystems and components of nuclear weapons.

The MESA Project is critical to meet NNSA needs. It must deliver capabilities to meet the long term needs of Stockpile Stewardship for continual advances in technologies that improve nuclear weapon surety as well as the more immediate LEP needs of incorporating advanced technologies into upcoming weapon refurbishments, eliminating present safety exceptions in the annual certification process. The microsystems that will be developed in MESA will have the ability to sense, think, act, and communicate within a wide range of environments. They will employ a technology base that spans photonics, mechanics, and radiation-hardened microelectronics on size and integration scales that have not been previously achieved. MESA will radically advance the use of computational modeling and simulation technologies to develop modular design tools for microsystems that can concurrently optimize designs for performance, manufacturability, inspection, qualification, certification, procurement, and cost in the design process. It will create linked virtual prototyping environments in which a microsystem-based product and its manufacturing processes are designed concurrently. Ultimately, the integrated technologies of research, design, and production will contribute to a reduction in the overall part count in a weapon system. It is this reduction in part count that appears to be the most promising approach to achieve needed cost and schedule reductions within the Stockpile Stewardship Program, the Life Extension Program, and related weapon campaigns.

In order to meet stockpile refurbishment requirements, Sandia has developed an integration effort focused on modernizing the non-nuclear components of nuclear weapons. Modern electrical, optical, and mechanical components are required to ensure the continuing safety, security, and reliability of the US nuclear deterrent. Achieving this objective requires integration of activities conducted within several of NNSA's campaigns, and it requires capital investment. To be able to provide modern components, outmoded equipment must be replaced and upgraded. Semiconductor processing equipment, in particular, is expensive and upgrades cost millions of dollars per tool. Commercial integrated circuit technology continues to advance in terms of performance and cost. As stated in the 1997 National Technology Roadmap for Semiconductors, the semiconductor industry has maintained its growth by achieving a 25-30% per-year cost reduction per function throughout its history. Key to this reduction has been a 30% reduction in feature size every three years. The reduction in feature size, and changes in fabrication technology and materials that accompany it, drives changes and consistent improvements in the capital equipment used to fabricate integrated circuits.

Existing Sandia facilities are not adequate in size or function to support the development, prototyping, and use of advanced design and fabrication technologies. Such technologies are critical to support microsystems design, simulation, and manufacturing; weapons performance assessments; renewal process analyses; and qualification of microsystems components, integrated subsystems, and the certification of the overall weapon system. MESA will employ state-of-the-art visualization technologies in support of stockpile stewardship activities. In addition, the retooled, silicon-based production capability (currently located in the existing MDL) and the new compound semiconductor cleanroom, in combination with required new light laboratory and work spaces to replace the CSRL, will allow MESA to conduct R&D, rapid prototyping, pre-production fabrication and analysis, and house a war reserve microsystem production capability for DOE/NNSA and the Nuclear Weapons Complex (NWC).

Project Scope

Infrastructure Upgrades

The infrastructure upgrades portion of this project includes systems upgrades to the existing Microelectronics Development Laboratory (MDL) and utilities upgrades to reroute existing utilities to enable construction of the MESA Complex.

The systems upgrades to the MDL will repair and modify part of the existing building infrastructure including the acid exhaust system, specialty gas room, process chilled water, make-up air, de-ionized water plant and emergency power. These upgrades are necessary in order to prepare for the equipment retooling of the MDL.

The utilities upgrades work reroutes existing communications, power, sewer, storm drain, steam, gas and water utilities and provides a utilities corridor for the proposed MESA building site.

Microelectronics Development Laboratory (MDL) Rad-hard Integrated Circuit (IC) Retooling

This portion of the project supports the costs of partially retooling the Microelectronics Development Laboratory with the equipment that is required in order to produce radiation hardened integrated circuits and provides the critical microsystem tools to allow R&D to progress during construction of the full MESA project. The MDL currently does not have the complete tool set needed to produce qualified war reserve (WR) radiation-hardened integrated circuits or microsystem products. The existing tool set is developmental in nature, is missing some key tools, and includes critical one-of-a-kind tools with no backup. Many of MDL's fabrication tools are more than 10 years old and have exceeded, or are approaching, the end of their useful lives. Downtime is increasing, supplier support for tool maintenance is decreasing, and spare parts are increasingly unavailable. More importantly, commercial vendors for radiation hardened integrated circuits soon will cease to exist, leaving Sandia as the only supplier for these key weapons components. Therefore, refurbishment of the MDL fabrication toolset is a critical capability that the Department must have. The parts of the MESA project involving retooling of the MDL will play a substantial role in developing weapon refurbishment options. The MDL will be an enduring, critical part of the MESA Complex.

The retooling effort primarily provides for equipment procurement, design and fit-up costs. The average tool delivery time ranges from six to twelve months after order, followed by installation design, installation, inspection and start up time. Tools are ordered in sequence to maximize efficiency and minimize downtime and disruptions to on-going MDL activities.

MESA Complex

- The MESA Project includes some work which is already complete or in progress, including:
- Site utilities (as described above under Infrastructure Upgrades)
- Retooling of equipment and support infrastructure in the existing MDL (as described above under Infrastructure Upgrades and MDL Rad-Hard IC Retooling)
- Critical microsystem retooling for the MDL.

The remaining project efforts, to begin in FY 2003 consistent with the approved Performance Baseline, include:

- A new cleanroom facility, light laboratories, and work spaces for personnel replacing the existing, but antiquated, Compound Semiconductor Research Laboratory (CSRL)
- New capital equipment associated with the cleanroom facility and light labs
- Light laboratories and work group and support spaces for researchers, scientists, and technology developers involved in computation, engineering sciences, microsystems, and weapons design who are focused on incorporating microsystems into planned weapon refurbishments
- Special visualization facilities to enable full deployment of ASC and ADaPT modeling and simulation tools for application to microsystems and full weapon development;
- Advanced communications cabling and network electronics to support unclassified and classified ultra-high speed local computing and inter-connectivity to supercomputing resources; and
- Decontamination and decommissioning of the CSRL once vacated.

The MESA facilities comprise approximately 391,000 gross square feet (gsf) and will include:

Microsystems Fabrication (MicroFab). This facility provides cleanrooms that replace the Compound Semiconductor Research Laboratory, Building 893 (CSRL), and transition cleanroom space for prototyping new devices. Built in the late 1980s as an "interim facility" with a five-year lifetime, Sandia scientists have literally "used up" the CSRL and it is no longer practical or cost effective to maintain this facility. Moreover, the mission of the CSRL has grown over time, and the current facility does not, and cannot, meet functional requirements. Therefore, this project will replace the CSRL with the MicroFab and retool approximately 80% of the existing tools used in this facility.

Microsystems Laboratory (MicroLab). This facility will house microsystems researchers and engineers and a small group of MESA external partners. It will accommodate chemical, electrical and laser light laboratories, workspaces to support approximately 274 personnel and a Design and Education Center. This new building will be used to conduct research and development critical to the development of microsystems components as well as rapid prototyping and testing of these components.

Weapons Integration Facility

Weapons Integration Facility – Classified (WIF-C). This portion of the WIF facility will house weapons designers, analysts and computational and engineering sciences (C&ES) staff. It will include a Visual Interactive Environment for Weapons Simulation (VIEWS) Corridor, visualization lab, primarily electrical and laser light laboratories and workspace to support approximately 274 personnel. This portion of the WIF buildings will facilitate design, system integration, and the qualification of weapons systems.

Weapons Integration Facility – Unclassified (WIF-U). This portion of the WIF facility will house C&ES staff and MESA partners. It will include an advanced scientific visualization laboratory, and workspaces to support approximately 100 personnel. This facility will enable collaboration and proximity between partners from industry and academia and Sandia scientists and engineers. Workspaces will encourage and provide the environment necessary for process development and two-way information transfer.

Project Milestones:

FY 2003:	Start of construction for the MicroFab	3Q
	Award construction procurement for the MicroLab	4Q
FY 2007:	Award construction procurement for the WIF	1Q
FY 2010:	WIF Critical Decision 4, Start of Operations	3Q

4. Details of Cost Estimate [a]

(dollars in thousands)

	Current Estimatee	Previous Estimate
Total, Design Phase (3.2% of TEC) [b c]	14,925	14,956
Construction Phase		
Buildings	170,000	175,000
Special Equipment	140,000	140,400
Utilities	4,300	4,800
Standard Equipment	7,600	7,800
Major Computer Items	16,900	17,500
Inspection, Design and project liaison, testing, checkout and acceptance	21,700	22,500
Construction Management (4.6% of TEC)	21,400	18,700
Project Management (2.8% of TEC)	12,700	13,200
Total Construction Costs (85.3% of TEC)	394,600	399,900
Contingencies		
Construction Phase (11.5% of TEC)	52,944	47,644
Total, Line Item Costs (TEC)	462,469	462,500

5. Method of Performance

Construction contracts will be awarded using Sandia's best value procurement process and will be awarded as firm fixed price contracts. Equipment will be procured using either design procurement and installation contracts or turnkey design/procure/install contracts as appropriate.

[a] The current estimate is based on BCP 03-17, which incorporates changes resulting from the FY 2003 appropriation increase above the request. A baseline change (BCP) will be processed during FY 2004 to incorporate the FY 2004 appropriation increase.

[b] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

[c] The PED portion of the project, which was funded under 01-D-103, was completed under budget by $30,827. The TEC and TPC for the project have been reduced by this amount.

6. Schedule of Project Funding

	(dollars in thousands)					
	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Design [a]	14,099	826	0	0	0	14,925
Construction	32,798	48,564	95,000	70,000	201,182	447,544
Total, Line Item TEC................................	46,897	49,390	95,000	70,000	201,182	462,469
Total Facility Costs (Federal and Non-Federal)	46,897	49,390	95,000	70,000	201,182	462,469
Other Project Costs [b]						
Conceptual design costs...........................	2,127	0	0	0	0	2,127
Decontamination & Decommissioning costs	0	0	0	0	4,600	4,600
NEPA documentation costs	121	0	0	0	0	121
Other ES&H costs....................................	1,670	400	400	400	600	3,470
Other project-related costs.........................	9,986	3,154	4,100	4,200	24,242	45,682
Total, Other Project Cost	13,904	3,554	4,500	4,600	29,442	56,000
Total Project Costs (TPC)..............................	60,801	52,944	99,500	74,600	230,624	518,469

[a] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

[b] Prior year OPC costs were updated to reflect actual costing per element noted above. Total OPC costs did not change.

7. Related Annual Funding Requirements

	(FY 2009 dollars in thousands)	
	Current Estimate	Previous Estimate
Annual facility operating costs [a]	2,900	2,900
Annual facility maintenance/repair costs [b]	1,700	1,700
Programmatic operating expenses directly related to the facility [c]	215,000	215,000
Capital equipment note related to construction but related to the programmatic effort in the facility [d]	18,300	18,300
Utility Costs [e]	2,400	2,400
Total related annual funding (operating from FY 2009 through FY 2038) [f]	240,300	240,300

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[a] Average annual facility operating costs for material and labor, including systems engineering, infrastructure operations, custodial, and maintenance and sub-sites management. An average total of 15.5 staff years per year will be required.

[b] Average annual facility maintenance and repair costs for materials and labor. An average of 8.0 craft years per year will be required. Costs include maintenance and ordinary repair, including tasks like removals and replacements, repair and refinishing that result from normal wear and tear and maintenance of the grounds.

[c] Programmatic operating expenses directly related to the MESA complex. This estimate reflects the annual operating expenses associated with programmatic work that will be done within the MESA complex. As such, this estimate reflects funding that is primarily already existing from other established DOE programs (i.e., Engineering Campaigns, Readiness in Technical Base and Facilities, Advanced Simulation and Computing, etc.). This estimate is based on costs for personnel associated with the integrated occupancy of MESA (integration of weapons design personnel, present CSRL personnel, present Microsystems Development Laboratory personnel and computational and engineering sciences personnel). In addition to costs for personnel time, this estimate also reflects costs for benefits, travel, purchases, corporate loads etc.

[d] Capital equipment not related to construction, but related to the programmatic effort in the facility. This reflects the average annual investment that is required in retooling and in replacement of fabrication and computing capital equipment to maintain toolsets one generation behind industry in microsystems technologies and at state-of-the-art in computational capability.

[e] Utility costs reflect the average annual costs for electricity, gas, water and sewer discharges.

[f] The MESA Complex will be fully operational in FY 2010 using a phased approach. Separate Critical Decision 4s (Start of Operation) are planned for each building as follows: MicroFab in FY 2007, the MicroLab in FY 2007and the WIF in FY 2010. FY 2009 was used as a base year in previous data sheets because it represented a midpoint for start of operations. To maintain consistency, annual funding requirements remain in FY2009 dollars despite the accelerated phased CD-4 dates.

Inertial Confinement Fusion Ignition and High Yield Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Inertial Confinement Fusion Ignition and High Yield Campaign					
Ignition	61,690	68,766	76,437	+ 7,671	11.2%
Support of Stockpile Program	27,608	33,003	38,987	+ 5,984	18.1%
NIF Diagnostics, Cryogenics, and Experiment Support	19,426	34,120	44,023	+ 9,903	29.0%
Pulsed Power Inertial Confinement Fusion	9,740	8,740	10,080	+ 1,340	15.3%
University Grants/Other Support	7,368	11,868	7,776	- 4,092	-34.5%
Facility Operations and Target Production	48,984	57,413	63,056	+ 5,643	9.8%
Inertial Fusion Technology	21,372	28,780	0	- 28,780	
NIF Demonstration Program	75,732	96,300	113,700	+ 17,400	18.1%
High-Energy Petawatt Laser Development	12,271	26,146	7,975	- 18,171	-69.5%
NIF Other Project Costs (OPC)	994	0	0	0	0.0%
NIF Construction	214,045	149,115	130,000	- 19,115	-12.8%
Total, Inertial Confinement Fusion Ignition and High Yield Campaign	499,230	514,251	492,034	- 22,217	-4.3%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Inertial Confinement Fusion Ignition and High Yield Campaign						
Ignition…………….	76,437	90,213	94,006	102,644	105,095	468,395
Support of Stockpile Program	38,987	42,997	45,636	49,089	50,208	226,917
NIF Diagnostics, Cryogenics, and Experiment Support……………	44,023	48,928	48,407	46,788	47,663	235,809
Pulsed Power						

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Inertial Confinement Fusion	10,080	10,190	10,760	10,940	11,300	53,270
University Grants/Other Support	7,776	7,920	8,123	8,358	8,477	40,654
Facility Operations and Target Production	63,056	65,836	80,181	77,428	211,814	498,315
NIF Demonstration Program.............	113,700	117,260	120,957	124,683	0	476,600
High-Energy Petawatt Laser Development.......	7,975	7,975	7,000	7,000	6,000	35,950
96-D-111, National Ignition Facility................	130,000	130,000	120,000	10,139	0	390,139
Total, Inertial Confinement Fusion Ignition and High Yield Campaign...........	492,034	521,319	535,070	437,069	440,557	2,426,049

Description

This program develops laboratory capabilities to create and measure extreme conditions of temperature, pressure, and radiation approaching those in a nuclear explosion and conducts weapons related research , including nuclear burn, in these environments; this capability is required to support assessments and certification of the nation's nuclear weapons stockpile.

With the FY 2004 Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign appropriation, the Congress advised NNSA to fund all National Ignition Facility (NIF)-related ICF Campaign experimental support activities as a separate budget item. In response to this recommendation, ICF Campaign subprograms have been restructured. All funding for ICF experimental support activities that are not related to the NIF has been shifted to the appropriate subprogram and the former Experimental Support Technologies subprogram has been re-named NIF Diagnostics, Cryogenics and Experiment Support. The name of the High-Yield Assessment subprogram has been changed to Pulsed Power Inertial Confinement Fusion; Operations of Facilities has been changed to the Facility Operations and Target Production subprogram, and now includes all funding for target production and delivery to ICF facilities; and, a new subprogram has been created for High-Energy Petawatt Laser Development funding.

Benefits to Program Goal 01.30.00.00 Inertial Confinement Fusion Ignition and High Yield
Within the Inertial Confinement Fusion Ignition and High Yield program , 10 subprograms each make unique contributions to Program Goal 01.30.00.00. The Ignition subprogram provides calculations, planning, target design, and experimental activities aimed at demonstrating laboratory ignition and assessing weapon performance issues related to thermonuclear burn. The Support of Stockpile Program subprogram provides calculations, planning, design and experimental activities for non-fusion ignition research related to weapon assessment and certification. Within the Ignition subprogram, both ignition and non-ignition activities rely on advanced simulation and computing for designing experiments and apply experimental results to validate computational capabilities and simulations subsequently applied to warhead analysis. Other subprogram efforts include National Ignition Facility (NIF) construction, NIF Demonstration Program, NIF Diagnostics, Cryogenics, and Experiment Support, Inertial Fusion Technology, Facilities Operations and Target Production, University Grants, Pulsed Power Inertial Confinement Fusion, and High-Energy Petawatt Laser Development. The subprogram for High-Energy Petawatt Laser Development includes construction of the OMEGA Extended Performance (OMEGA EP) laser project at the University of Rochester Laboratory for Laser Energetics.

Program Assessment Rating Tool (PART)
The OMB used PART to review this program for the FY 2005 budget. The NNSA Inertial Confinement Fusion Ignition and High Yield Campaign received a rating of Moderately Effective from the OMB. The OMB assessment found that clear and succinct performance measures were difficult to articulate for the program. In response to OMB's recommendations, NNSA is continuing to refine these performance measures during the FY 2006 PPBE process. Additionally, the OMB assessment found that the program appears to be better managed than it was several years ago. However, OMB encouraged frequent monitoring by independent evaluators to include those retained by the Department of Defense.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Continue construction of the National Ignition Facility (NIF), and rebaseline future construction plans, total costs, and schedules by June 2000. (MET GOAL)	Implement the Secretary's Six Point Plan to improve project management of the National Ignition Facility (NIF) project and approve a new baseline. (FMFIA) (MET GOAL)	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of progress towards creating and measuring extreme temperature and pressure conditions for the 2010 nuclear stockpile stewardship requirements.	Completed 56% of progress toward creating and measuring extreme conditions	Complete 63% of progress toward creating and measuring extreme conditions	Complete 68% of progress toward creating and measuring extreme conditions.	Complete 73% of progress toward creating and measuring extreme conditions .	Complete 79% of progress toward creating and measuring extreme conditions .	Complete 82% of progress toward creating and measuring extreme conditions .	Complete 91% of progress toward creating and measuring extreme conditions .	Complete 100% FY 2010.
Cumulative percentage of progress towards demonstrating ignition (simulating fusion conditions in a nuclear explosion) at the National Ignition Facility (NIF) to increase confidence in modeling weapons performance.	Completed 55% of progress toward demonstrating ignition.	Complete 63% of progress toward demonstrating ignition.	Complete 68% of progress toward demonstrating ignition.	Complete 72% of progress toward demonstrating ignition.	Complete 78% of progress toward demonstrating ignition.	Complete 82% of progress toward demonstrating ignition.	Complete 86% of progress toward demonstrating ignition.	Demonstrate ignition FY 2014.
Cumulative percentage of construction completed on the 192-laser beam NIF.	Completed 65% of NIF construction.	Complete 74% of NIF construction.	Complete 81% of NIF construction.	Complete 88% of NIF construction.	Complete 96% of NIF construction.	Complete 100% of NIF construction.	N/A	Complete NIF construction. FY 2008.
Cumulative percentage of equipment fabricated to support ignition experiments at NIF	Completed 7% of equipment fabrication.	Complete 16% of equipment fabrication.	Complete 30% of equipment fabrication.	Complete 44% of equipment fabrication.	Complete 58% of equipment fabrication.	Complete 72% of equipment fabrication.	Complete 86% of equipment fabrication.	Complete 100% of equipment fabrication. FY 2010.
Annual number of days available to conduct stockpile stewardship experiments, totaled for all ICF facilities. (EFFICIENCY MEASURE)	Provided 580 days for experiments.	Provide 500 days for experiments.	Provide 500 days for experiments.	Provide 500 days for experiments.	Provide 500 days for experiments.	Provide 500 days for experiments.	Provide 800 days for experiments.	Ongoing

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Ignition..	**61,690**	**68,766**	**76,437**

Supports application of ASCI derived capabilities in calculations, planning, design and experimental activities aimed at risk reduction and development of the physics basis for indirect drive and direct drive inertial confinement fusion ignition. Includes related ignition target fabrication research and development (R&D), exploration of diagnostic techniques to support ignition research, and computer codes and modeling improvements essential to ICF Campaign efforts. In FY 2005, specific emphasis will be focused on supporting activities related to initial NIF ignition experiments, development of ignition targets, and continuation of efforts to develop the physics basis for direct drive ignition.

Support of Stockpile Program......................................	**27,608**	**33,003**	**38,987**

Funds non-ignition High Energy Density Physics (HEDP) experiments at ICF facilities in support of the current scope of the Stockpile Stewardship Program (SSP). Provides specific data required for SSP campaign activities and advanced simulations. Develops experimental capabilities and analytic tools required to perform HEDP experiments and validate ASCI simulations to meet support requirements identified by SSP campaigns and activities. In FY 2005, specific emphasis will be focused on preparing and conducting initial experiments utilizing NIF and performing OMEGA and Z experiments to validate computational models relevant to specific stockpile issues.

NIF Diagnostics, Cryogenics and Experiment Support..	**19,426**	**34,120**	**44,023**

Supports technologies needed to execute SSP and ICF Campaign experiments at NIF. Includes the engineering and fabrication of NIF core and advanced diagnostics; definition, prototyping, design and construction of the NIF cryogenic target system; fabrication of diffractive optics for NIF experiments; integration and operation of the NIF Target Area; and funding for the NIF User Support Office . During FY 2005, major emphasis will be placed on design and development of NIF cryogenic target support systems; development and delivery of NIF diagnostic systems, and support for experiments.

Pulsed Power Inertial Confinement Fusion.................	**9,740**	**8,740**	**10,080**

Supports activities at Sandia National Laboratories needed to establish the technical basis for assessing the feasibility for pulsed power z pinches to produce ignition and significant neutron yield. Completion of the Pulsed Power ICF technical assessment is planned for FY 2008.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
University Grants/Other Support	**7,368**	**11,868**	**7,776**

Supports university grants and research programs in high-energy-density science, National Laser User Facility (NLUF) activities on OMEGA, and critical needs of the campaign.

Facility Operations and Target Production	**48,984**	**57,413**	**63,056**

Supports the operation of facilities, including OMEGA, Z machine, Nike, and Trident, in a safe, secure manner for ICF Ignition and High Yield Campaign activities and other authorized users. Includes funding for ICF target production and delivery to ICF facilities, data collection and archiving, routine facility maintenance and engineering support, and support for facility-supplied diagnostics. Commissioning of NIF laser systems will be funded through the NIF Demonstration Program until the facility's entire complement of laser systems is fully operational at the end of FY 2008, at which time NIF operational funding will be included in this subprogram.

Inertial Fusion Technology	**21,372**	**28,780**	**0**

Develops technology options for inertial fusion and stockpile stewardship using high-average power lasers (HAPL) and z-pinches. It is not funded in FY 2005 due to the requirements of higher priority activities.

NIF Demonstration Program..	**75,732**	**96,300**	**113,700**

Consistent with the approved NIF Project baseline, this funding element supports the activities associated with completing the NIF to the point where full operations commence and includes costs for the integration, planning, assembly, installation, and activation for the NIF. Included is the phased turnover of lasers to commissioning and operations teams, an area of increased activity and key importance for FY 2005 through FY 2008.

High-Energy Petawatt Laser Development	**12,271**	**26,146**	**7,975**

This new subprogram supports development of high-energy petawatt (HEPW) laser technology, including diffraction gratings, for existing and future major ICF facilities. Supports design and construction of OMEGA Extended Performance laser beam lines at the University of Rochester Laboratory for Laser Energetics OMEGA facility. NNSA plans to construct a 2-beam petawatt laser system at OMEGA. A separate data sheet describing planned OMEGA Extended Performance activities and funding levels is included with this budget submission.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
NIF Other Project Costs	**994**	**0**	**0**

Supports National Environmental Policy Act (NEPA) documentation, including environmental impact statement and environmental monitoring and permits, and assurances, safety analysis and integration. Final increment of funding required for these activities was provided in FY 2003.

NIF Construction	**214,045**	**149,115**	**130,000**

96-D-111, National Ignition Facility, Lawrence Livermore National Laboratory. Funding decreases in FY 2005 are consistent with the current Project baseline. Major milestones for FY 2005 include: commissioning first laser beam bundle (8 individual laser beams), obtaining NNSA concurrence on NIF Final Safety Analysis Report, and completing laser glass melting.

Total, Inertial Confinement Fusion Ignition and High Yield Campaign	**499,230**	**514,251**	**492,034**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Ignition**	
Funding increase supports investigation of new concepts in ignition target design and fabrication, expanded research in direct-drive cryogenic target implosions, initial NIF laser-plasma interaction experiments, development of ignition diagnostics, and experiments to guide selection of an initial NIF phase plate set to support ignition research..	+ 7,671
▪ **Support of Stockpile Program**	
Increase supports planning, execution and analysis of stockpile related experiments needed to validate advanced ASCI codes and that support stockpile assessment and certification. Provides funding for design and fabrication of increasingly complex non-ignition targets and diagnostics development for stockpile related experiments. This increase also reflects expansion in the use of NIF to conduct experiments to support the stockpile	+ 5,984
▪ **NIF Diagnostics, Cryogenics and Experiment Support**	
Funding increases reflect planned increases in the use of NIF for ICF experimental activities. Major efforts receiving increases in funding include NIF user support, construction and operational support for diagnostics, cryogenic systems design and development activities, and diffractive optics............................	+ 9,903
▪ **Pulsed Power Inertial Confinement Fusion**	
Increase supports activities at Sandia National Laboratories needed to establish the technical basis for assessing the feasibility for pulsed power z-pinches to produce ignition and significant neutron yield. Includes expansion of computational activities and some supporting experiments to determine the potential of z-pinches to produce high yield	+ 1,340
▪ **University Grants/Other Support**	
Decrease reflects Congressional funding additions provided in the FY 2004 appropriation for the ICF Campaign to support university activities in short-pulse high-intensity laser development	- 4,092

	FY 2005 vs. FY 2004 ($000)
Facility Operations and Target Production Funding increase provides for additional utilization of the Z Beamlet backlighter in support of planned experiments and increases in target production to support research programs at ICF facilities, including the NIF. Increase also reflects costs associated with additional complexity in targets and experimental support technologies required to support expansion in ICF research at OMEGA and Z machine	+ 5,643
Inertial Fusion Technology Decrease reflects funding provided by Congress in the FY 2004 appropriation to support inertial fusion technology development (High Average Power Lasers and Z-Pinch Inertial Fusion Energy) above the request for the ICF Campaign.	- 28,780
NIF Demonstration Program Increase supports the approved NIF baseline and reflects planned shift in activity for major portions of the NIF from construction to engineering integration, test and activation. Funding supports assembly, installation, and testing of laser components and laser commissioning activities including Management Pre-start Reviews. During FY 2005, commissioning and turnover for laboratory use will be completed for the 1st laser beam bundle (8 individual laser beams)	+ 17,400
High-Energy Petawatt Laser Development This request reflects the plan for completing a 2-beam petawatt laser for the OMEGA EP facility at the University of Rochester Laboratory for Laser Energetics and developing diffractive gratings	- 18,171
Construction Decrease is consistent with the approved NIF baseline. It reflects the planned shift for major portions of the NIF from construction to engineering integration, test, and activation	- 19,115
Total Funding Change, Inertial Confinement Fusion Ignition and High Yield Campaign	**- 22,217**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects..........................	1,614	1,662	1,712	+ 50	+ 3.0%
Capital Equipment	18,050	26,202	11,358	-14,844	-56.7%
Total, Capital Operating Expenses	19,664	27,864	13,070	-14,794	-53.1%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Unappro-priated Balance
96-D-111, National Ignition Facility	2,094,897	1,340,713	214,045	149,115	130,000	261,024
Total, Construction			214,045	149,115	130,000	

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations, and the actual or requested funding for the OMEGA EP, which when completed, will be DOE-owned capital equipment. The decrease in FY 2005 is due to the reduction in the funding for OMEGA EP.

96-D-111, National Ignition Facility (NIF), Lawrence Livermore National Laboratory, Livermore, California

Significant Changes

- None.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)	Other Related Costs ($000)	Total Project-Related Costs ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete				
FY 1996 Budget Request (*Preliminary Estimate*)	1Q 1996	1Q 1998	3Q 1997	3Q 2002	842,600	1,073,600	N/A	N/A
FY 1998 Budget Request (*Title I Baseline*)..................	1Q 1996	1Q 1998	3Q 1997	3Q 2003	1,045,700	1,198,900	N/A	N/A
FY 2000 Budget Request.......	1Q 1996	2Q 1998	3Q 1997	3Q 2003	1,045,700	1,198,900	N/A	N/A
FY 2001 Budget Request..........	1Q 1996	2Q 1998	3Q 1997	3Q 2003	1,045,700	1,198,900	833,100	2,032,000
FY 2001 Amended Budget Request....................................	1Q 1996	2Q 1998	3Q 1997	4Q 2008	2,094,897	2,248,097	1,200,000	3,448,097
FY 2005 Budget Request (*Current Baseline Estimate*)	1Q 1996	2Q 1998	3Q 1997	4Q 2008	2,094,897	2,248,097	1,200,000	3,448,097

2. Financial Schedule

Total Estimated Cost (TEC) Funding

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
1996	37,400	37,400	33,991
1997	131,900	131,900	74,294
1998	197,800	197,800	165,389
1999	284,200	284,200	251,476
2000	247,158[a]	247,158	252,766
2001	197,255[b]	197,255	254,725
2002	245,000	245,000	282,153
2003	214,045[c]	214,045	215,060
2004	150,000[d]	150,000	154,150
2005	130,000	130,000	130,000
2006	130,000	130,000	130,000
2007	120,000	120,000	120,000
2008	10,139	10,139	30,893

3. Project Description, Justification, and Scope

The Project provides for the design, procurement, construction, assembly, and acceptance testing of the National Ignition Facility (NIF). The NIF is an experimental inertial confinement fusion facility intended to achieve controlled thermonuclear fusion in the laboratory by imploding a small capsule containing a mixture of the hydrogen isotopes, deuterium and tritium. The NIF is being constructed at the Lawrence Livermore National Laboratory (LLNL), Livermore, California as determined by the Record of Decision made on December 19, 1996, as a part of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM PEIS).

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[a] Original appropriation was $248,100,000. This was reduced by $942,000 for the FY 2000 rescission enacted by P.L. 106-113.

[b] The FY 2001 amended budget request of $209,100,000 was reduced by Congress to $199,100,000. The appropriation of $199,100,000 was reduced by $1,410,000 due to the Safeguards and Security (S&S) amendment, and by $435,000 by a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[c] Original appropriation was $214,045,000. This was reduced by $1,360,000 for a rescission and by $4,853,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $6,213,000 by a reprogramming.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

The NNSA Inertial Confinement Fusion (ICF) Campaign carries out many of the high energy density physics (HEDP) experiments required for success of the Stockpile Stewardship Program (SSP). The demonstration of fusion ignition in the laboratory is an important component of the SSP Program and a major goal of NIF and the ICF Campaign. The NIF is designed to provide the experimental capability required for the ICF Campaign to achieve propagating fusion burn and modest (1-10) energy gain (currently planned for within 4-5 years of full operation) and to conduct high-energy-density experiments, through both fusion ignition and direct application of the high laser power. The NIF will also provide the capability to conduct non-ignition HEDP experiments critical to the success of the SSP. Technical capabilities provided by the ICF Campaign also contribute to other DOE/NNSA requirements including nuclear weapons effects testing and the development of inertial fusion power. Ignition and other objectives for NIF were identified in the NIF Justification of Mission Need, which was endorsed by the Secretary of Energy. Identification of target ignition as the next important step in ICF development for both defense and non-defense applications is consistent with the earlier (1990) recommendation of DOE's Fusion Policy Advisory Committee, and the National Academy of Sciences Inertial Fusion Review Group. In 1995, the DOE Inertial Confinement Fusion Advisory Committee affirmed the program's readiness for an ignition experiment. A review by the JASONs in 1996 affirmed the value of the NIF for stockpile stewardship.

The NIF project supports the DOE mandate to maintain nuclear weapons science expertise required for stewardship of the stockpile. After the United States announcement of a moratorium on underground nuclear tests in 1992, the Department established the SSP to ensure the preservation of the core intellectual and technical competencies in nuclear weapons. The NIF is one of the most vital facilities in that program. The NIF will provide the capability to conduct laboratory experiments to address the high energy density and fusion aspects that are important to both primaries and secondaries in stockpile weapons.

At present, the Nation's computational capabilities and scientific knowledge are inadequate to ascertain all of the performance and safety impacts from changes in the nuclear warhead physics packages due to aging, remanufacturing, or engineering and design alterations. Such changes are inevitable if the warheads in the stockpile are retained well into this century, as expected. In the past, the impacts of such changes were evaluated through nuclear weapon tests. Without underground tests, we will require better, more accurate computational capabilities to assure the reliability and safety of the nuclear weapons stockpile for the indefinite future.

To achieve the required level of confidence in our predictive capability, it is essential that we have access to near-weapons conditions in laboratory experiments. The importance of nuclear weapons to our national security requires such confidence. For detonation of weapon primaries, that access is provided in part by hydrodynamic testing. For secondaries and for some aspects of primary performance, the NIF will be a principal laboratory experimental physics facility.

The most significant potential commercial application of ICF in the long term is the generation of electric power. Consistent with the recommendations of the Fusion Policy Advisory Committee, the NIF will provide a unique capability to address critical elements of the inertial fusion energy program by: exploring moderate gain (1-10) target designs, establishing requirements for driver energy and target illumination for high gain targets, and developing materials and technologies useful for civilian inertial fusion power reactors.

The ignition of an inertial fusion capsule in the laboratory will produce extremely high temperatures and densities in matter. Thus, the NIF will also become a unique and valuable laboratory for experiments relevant to a number of areas of basic science and technology (e.g., stellar phenomena).

The NIF is an experimental fusion facility consisting of a laser and target area, and associated assembly and refurbishment capability. The laser will be capable of providing an output pulse with an energy of 1.8 megajoules (MJ) and an output pulse power of 500 terawatts (TW) at a wavelength of 0.35 micrometers (μm) and with specified symmetry, beam balance and pulse shape. The NIF design is an experimental facility housing a multibeam line, neodymium (Nd) glass laser capable of generating and delivering the pulses to a target chamber. In the target chamber, a positioner will center a target containing fusion fuel, a deuterium-tritium mixture, for each experiment.

The NIF experimental facility, titled the Laser and Target Area Building (LTAB), will provide an optically stable and clean environment. The LTAB will be shielded for radiation confinement around the target chamber and will be designed as a radiological, low-hazard facility capable of withstanding the natural phenomena specified for the LLNL site. The baseline facility is for one target chamber, but the design shall not preclude future upgrade for additional target chambers.

The NIF project consists of conventional and special facilities:

- Site and Conventional Facilities include the land improvements (e.g., grading, roads) and utilities (electricity, heating gas, water), as well as the LTAB, which has an approximately 20,300 square meters footprint and 38,000 square meters in total area. It is a reinforced concrete and structural steel building that provides the vibration-free, shielded, and clean space for the installation of the laser, target area, and integrated control system. The LTAB has two laser bays, each 31 meters (m) by 135 m long, and a central target area--a heavily shielded (1.8 m thick concrete) cylinder 32 m in diameter and 32 m high. The LTAB includes security systems, radioactive confinement and shielding, control rooms, supporting utilities, fire protection, monitoring, and decontamination and waste handling areas. Optics assembly and refurbishment capability is provided for at LLNL by incorporation of an optics assembly area attached to the LTAB and minor modifications of other existing site facilities.

- Special facilities include the Laser System, Target Area, Integrated Computer Control System, and Optics.

  - The laser system is designed to generate and deliver high power optical pulses to the target chamber. The system consists of 192 laser beams configured to illuminate the target surface with a specified symmetry, uniformity, and temporal pulse shape. The laser pulse originates in the pulse generation system. This precisely formatted low energy pulse is amplified in the main amplifier. To minimize intensity fluctuation, each beam is passed through a pinhole in a spatial filter on each of the four passes through the amplifier and through a transport spatial filter. The beam transport directs each high power laser beam to an array of ports distributed around the target chamber where the frequency of the laser light is tripled to 0.35 μm, spatially modulated and focused on the target. Systems are provided for automatic control of alignment and the measurement of the power and energy of the beam. Structural support and auxiliary systems provide the stable platform and utilities required.

- The target area includes a 10 m diameter, low activation (i.e., activated from radiation) aluminum vacuum chamber located in the Target Area of the LTAB. Within this chamber, the target will be precisely located. The chamber and building structure provide confinement of radioactivity (e.g., x-rays, neutrons, tritium, and activation products). Diagnostics will be arranged around the chamber to demonstrate subsystem performance for project acceptance tests. Structural, utility and other support systems necessary for safe operation and maintenance will also be provided in the Target Area. The target chamber, the target diagnostics, and staging areas will be capable of conducting experiments with cryogenic targets. The Experimental Plan indicates that cryogenic target experiments for ignition will be needed 2-3 years after completion of the project. Therefore, the targets and this cryogenic capability will be supplied by the experiments. The NIF project will make mechanical and electrical provisions necessary to position and align the cryogenic targets within the chamber. The baseline is for indirectly driven targets. An option for future modifications to permit directly driven targets is included in the design.

- The integrated computer control system includes the computer systems (note: no individual computer will cost over $100,000) required to control the laser and target systems. The system will provide the hardware and software necessary to support initial NIF acceptance and operations checkout. Also included is an integrated timing system for experimental control of laser and diagnostic operations, safety interlocks, and personnel access control.

- Thousands of optical components will be required for the 192-beamlet NIF. These components include laser glass, lenses, mirrors, polarizers, deuterated potassium dihydrogen phosphate crystals, potassium dihydrogen phosphate crystals, pulse generation optics, debris shields and windows, and the required optics coatings. Optics includes quality control equipment to receive, inspect, characterize, and refurbish the optical elements.

Project Milestones:

Major milestones and critical decision points have not changed:

Milestones	Date
Approval of Mission Need (CD1)	Jan 1993
Title I Initiated	Jan 1996
NEPA Record of Decision	Dec 1996
Approval to Initiate Construction (CD3)	Mar 1997
Start Special Equipment Installation	Nov 1998
1st light to Target Chamber Center	Jun 2004
12 bundles Commissioned	Jun 2007
24 bundles Commissioned	Sep 2008
Project Complete (CD4)	Sep 2008

Project milestones for FY 2003 included:

- Laser Bay 2, Cluster 3 Beampath installed — 1Q (completed 1Q FY2002)
- First Laser Bay 2 Flashlamp installed — 2Q (completed 4Q FY2002)
- Optics Assembly Building operational — 3Q (completed 1Q FY2003)
- Target Positioner (TARPOS) installed in Target Bay 2 — 3Q (completed 2Q FY2003)

Project milestones for FY 2004 include:

- First Light to Target Chamber Center — 3Q (completed 2Q FY2003)
- Achieve 10 kilo-joules 1 omega light — 4Q (completed 1Q FY2003)
- Switchyard 2 Beampath to Commissioning — 4Q (completed 1Q FY2003)

Project milestones for FY 2005 include:

- Glass Melting complete — 1Q
- FSAR concurrence — 2Q
- First Bundle commissioned — 3Q

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	245,000	219,573
Design Management Costs (2.0% of TEC)	41,500	39,400
Project Management Costs (2.0% of TEC)	42,450	40,414
Total Design Costs (15.7% of TEC)	328,950	299,387
Construction Phase		
Improvements to Land	1,800	1,800
Buildings	179,000	179,000
Special Equipment	1,260,859	1,268,281
Utilities	500	500
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	139,566	132,566
Construction Management (0.9% of TEC)	18,000	18,000
Project Management (2.9% of TEC)	61,594	59,594
Total Construction Costs (79.3% of TEC)	1,661,319	1,659,741
Contingencies		
Design Phase (.5% of TEC; 2.2% of remaining TEC BA)	9,727	21,642
Construction Phase (4.5% of TEC; 21.8% of remaining TEC BA)	94,901	114,127
Total Contingencies (5.0% of TEC; 24.0% of remaining TEC BA)	104,628	135,769
Total, Line Item Costs (TEC)	2,094,897	2,094,897

The cost estimate assumes a project organization and cost distribution consistent with the management requirements appropriate for a DOE Major System as outlined in the NIF Project Execution Plan. Actual cost distribution will be in conformance with accounting guidelines in place at the time of project execution.

5. Method of Performance

The NIF Project Office (consisting of LLNL, Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNL), and University of Rochester Laboratory for Laser Energetics (UR/LLE) representation, and supported by competitively selected contracts with Architect/Engineering firms, an integration management and installation contractor, equipment and material vendors, and construction firms) will prepare the design, procure equipment and materials, and perform conventional construction, safety, system analysis, and acceptance tests. The DOE/NNSA will maintain oversight and coordination through the NNSA Office of the NIF Project. All activities are integrated through the guiding principles and five core functions of the DOE Order on Integrated Safety Management Systems (ISMS) (DOE P450.4). DOE conducted the site selection and the NEPA determination in the SSMPEIS. LLNL was selected as the construction site in the Record of Decision made on December 19, 1996.

5.1 NIF Execution

5.1.1 Conceptual and Advanced Conceptual Design

The conceptual design was completed in May 1994 by the staff of the participating laboratories. Keller and Gannon contractors provided designs of the conventional facilities and equipment.

Design requirements were developed through the Work Smart Standards (WSS) Process approved by the Director of the Oakland Operations Office. New requirements have been defined since the original WSS was placed in Contract 48 in 1997. A gap analysis will be performed, and if changes are required a revision will be prepared.

The Conceptual Design Report was subjected to an Independent Cost Estimate (ICE) review by Foster Wheeler USA under contract to the DOE. The advanced conceptual design phase further developed the design, and is the phase in which all the criteria documents that govern Title I Design were reviewed and updated.

5.1.2 Title I Design

In FY 1996, Title I Design began with the contract award for the Architect/Engineers (Parsons and AC Martin) and a Construction Management firm (Sverdrup) for the design and the constructiblity reviews of the: (1) NIF Laser and Target Area Building, and (2) Optics Assembly Building. Title I Design included developing advanced design details to finalize the building and the equipment arrangements and the service and utility requirements, reviewing project cost estimates and integrated schedule, preparing procurement plans, conducting design reviews, completing the Preliminary Safety Analysis Report and National Environmental Protection Act (NEPA) documentation, and planning for and conducting the constructibility reviews.

Title I Design was completed in November 1996 and was followed by an Independent Cost Estimate review.

5.1.3 Title II Design

The participants in Title II (final design) include LLNL, LANL, SNL, Parsons, AC Martin, and Jacobs/Sverdrup (constructibility reviews). The Title II Design provides construction subcontract packages and equipment procurement packages, construction cost estimate and schedule, Acceptance Test Procedures, and the acceptability criteria for tested components (e.g., pumps, power conditioning, and special equipment), and environmental permits for construction (e.g., *Storm Water Pollution Prevention Plan*).

5.1.4 Title III Design

The Title III engineering participants include LLNL, Parsons, AC Martin, and Jacobs/Sverdrup. Title III engineering represents the engineering necessary to support the construction and equipment installation, including inspection and field engineering. The main activities are to perform the engineering necessary to resolve issues that may arise during construction (e.g., fit problems and interferences). Title III engineering will result in the final as-built drawings that represent the NIF configuration.

5.1.5 Construction and Equipment Procurement, Installation, and Acceptance

Based on the March 7, 1997, Critical Decision 3 (CD-3), construction began with site preparation and excavation of the Laser Target Area Building (LTAB) forming the initial critical-path activities. The NIF Construction Safety program was approved and sets forth the safety requirements at the construction site for all LLNL and non-LLNL (including contractor) personnel. There was sufficient Title II Design completed to support bid of the major construction and equipment procurements. The conventional facilities are designed as construction subcontract bid packages and competitively bid as firm fixed price procurements. The initial critical-path construction activities include both the Laser and Target Area Building and the Optics Assembly Building (where large optics assembly and staging will take place). In addition, the site support infrastructure needed to support construction of conventional facility, beampath infrastructure installation, and line replaceable equipment and optics staging are being put in place. At the same time, procurements on the critical path (e.g., target chamber) began following the established *NIF Acquisition Plan*.

The next major critical path activity is the assembly and installation of the Beampath Infrastructure Systems. These are the structural and utility systems required to support the line replaceable units. The management and installation of the Beampath Infrastructure System is being contracted to an Integration Management and Installation Contractor. This was done to fully involve industry in the construction of NIF as directed in the Secretary of Energy's 6-Point Plan and recommended by the Secretary of Energy Advisory Board interim report in January 2000. During the period of Beampath Infrastructure System installation, line replaceable unit and optics procurements continue.

The line replaceable unit equipment will be delivered, staged, and installed as phased beneficial occupancy of the Laser and Target Area Building is achieved. This is a complex period in which priority conflicts may occur because construction, equipment installation, and acceptance testing will be occurring. The Product Line Managers, Area Integration Managers, and Integration Management and Installation Contractor will manage and integrate the activities to avoid potential interferences affecting the schedule. The construction, equipment installation, and acceptance testing will be supported by Title III inspection and field engineering, which will include resolving construction and installation issues and preparing the final as-built drawings.

5.1.6 Operational Testing and Commissioning

After installation, the facility and equipment will be commissioned prior to the phased turnover to the operations organization. The transfer points employ the Management Pre-Start Review process in which an independent team evaluates the readiness (e.g., training and qualification of operators, Commissioning Test Procedures results, and as-built drawings) and recommends turnover by the NIF Project Manager. The NIF Project Manager approves the transfer of responsibility for ISMS Work Authorization.

The integrated system activation will begin with the commissioning of the first bundle. Management Pre-Start Reviews (MPRs) will be used by the Project Manager to control each system turnover. In specific cases, such as first light, first tritium experiment, and ignition readiness, the DOE/NNSA Field Office will oversee and concur in the MPR. A sequence of MPRs are scheduled to ensure a disciplined and controlled turnover of NIF systems from construction to activation. MPRs will be conducted by LLNL prior to the start of first tritium experiments and NIF 192-beam operation, and the results will be validated by National Nuclear Security Administration Office of the NIF Project readiness assessments (RA-1 and Full NIF RA. respectively). The first tritium experiment and 192-beam readiness assessments require that an FSAR evaluating the appropriate set of hazards be completed and approved (including the documented operating/maintenance procedures, operating staff training, and as-built design documentation). The 192-beam Readiness Assessment results are a key input for CD-4 (Project closeout) by the Acquisition Executive.

5.1.7 Project Completion

The complete set of NIF criteria is contained in the *NIF Functional Requirements and Primary Criteria*. This is the criteria that NIF is required to meet when fully operational. However, early experimental capability at the NIF is achieved before Project completion through a series of turnovers controlled by Management Pre-Start Reviews. This enables the Program to begin experiments in support of Stockpile Stewardship and other programmatic missions at the earliest possible date, as NIF performance capability is building up toward the eventual goals set out in the *NIF Functional Requirements and Primary Criteria* and *Project Completion Criteria*.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Costs						
Design	312,043	13,434	8,900	3,000	1,300	338,677
Construction	1,002,751	201,626	145,250	127,000	279,593	1,756,220
Total, Line item TEC	1,314,794	215,060	154,150	130,000	280,893	2,094,897
Other Project Costs						
R&D necessary to complete construction [a]	103,859	81	0	0	0	103,940
Conceptual design costs [b]	12,300	0	0	0	0	12,300
NEPA documentation costs [c]	6,130	729	303	1,090	3,438	11,690
Other project-related costs [d]	21,965	385	526	684	1,710	25,270
Total, Other Project Costs	144,254	1,195	829	1,774	5,148	153,200
Total Project Cost (TPC)	1,459,048	216,255	154,979	131,774	286,041	2,248,097
Other Related Operations and Maintenance Costs– NIF Demonstration Program	550,859	74,542	96,300	113,700	364,599	1,200,000
TOTAL Project and Related Costs	2,009,907	290,797	251,279	245,474	650,640	3,448,097
Budget Authority (BA) requirements [e]						
TEC (capital funding)	1,340,713	214,045	150,000	130,000	260,139	2,094,897
OPC (O&M funding)	152,206	994	0	0	0	153,200
NIF Demonstration Program(O&M funding) [f]	551,368	75,732	96,300	113,700	362,900	1,200,000
Total, BA requirements	2,044,287	290,771	246,300	243,700	623,039	3,448,097

[a] Costs include optics vendor facilitization and optics quality assurance.

[b] Includes original conceptual design report completed in FY 1994 and the conceptual design activities for the optical assembly and refurbishment capability and site infrastructure.

[c] Includes preparation of the NIF portion of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement, NIF Supplemental Environmental Impact Statement and environmental monitoring and permits; OSHA implementation.

[d] Includes engineering studies (including advanced conceptual design) of project options; assurances, safety analysis, and integration; start-up planning, management, training and staffing; procedure preparation; startup; and Operational Readiness Review.

[e] Long-lead procurements and contracts require BA in advance of costs.

[f] Funding requested and appropriated in the Inertial Confinement Fusion program and, beginning in FY 2001, under the Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign is required to maintain the Project baseline. The out-year funding profile is $117,260,000 in FY 2006; $120,957,000 in FY 2007; and $124,683,000 in FY 2008.

7. Related Annual Funding Requirements

	Current Estimate	Previous Estimate
Annual facility operating costs [a]	40,666	36,670
Annual facility maintenance/repair costs [b]	73,186	65,209
Programmatic operating expenses directly related to the facility [c]	0	0
Capital equipment not related to construction but related to the programmatic effort in the facility	221	216
GPP or other construction related to the programmatic effort in the facility	221	216
Utility costs [d]	14,237	13,944
Other costs [e]	1,814	1,777
Total related annual funding (estimate based on operating life of FY 2009 through FY 2038)	130,345[f]	118,032[g]

[a] Includes all NIF support personnel who are not in facility maintenance as described in note b (198 personnel). This is based on the latest facility use projection of 746 shots in FY 2011.

[b] Includes refurbishment of laser and target systems, building maintenance, and component procurement based on 746 shots in FY 2011 (213 personnel).

[c] For these costs, refer to the National Stockpile Stewardship Program.

[d] Estimate of electricity costs based on currently projected rates.

[e] Facility usage estimate of industrial gases (argon, synthetic air).

[f] In FY 2005 dollars.

[g] In FY 2004 dollars.

OMEGA Extended Performance (EP) Project, University of Rochester / LLE, Rochester, New York

- This is the first time this Operating Expense-funded project data sheet is being submitted. Funding was first appropriated for this project in FY 2003, with additional funding provided in the FY 2004 Energy and Water Development Appropriations Act.

- The project is still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (Critical Decision 2).

1. Laser Construction Schedule

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	Design Work Initiated	Design Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2005 Budget Request *(Current Estimate)*………….	1Q 2003	2Q 2004	2Q 2004	4Q 2009	67,000	77,700

2. Financial Schedule

Operating Expense Funded
(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
2003	13,000 [a]	13,000	13,000
2004	21,000 [b]	21,000	21,000
2005	6,000	6,000	6,000
2006	7,000	7,000	7,000
2007	7,000	7,000	7,000
2008	7,000	7,000	7,000
2009	6,000	6,000	6,000

[a] Initial Congressional O&M funding was provided in the FY 2003 Energy and Water Development Appropriations Act (P.L. 108-7).

[b] Funding was provided in the FY 2004 Energy and Water Development Appropriations Act (P.L. 108-137)

3. Project Description, Justification and Scope

Project Description

The OMEGA EP project is the design, manufacture, assembly, and testing of two short pulse laser beams to complement the existing capability of the OMEGA laser system. The two new beamlines are to be built in a new building that is being funded by the University of Rochester at the Laboratory for Laser Energetics site. Many aspects of the NIF and the OMEGA architectures will be used to produce the high-energy beams. The intended use of the two beams is to backlight events created by the OMEGA laser for greater understanding of implosion events. The project is broken down into six primary technical areas:

Laser Sources - The laser sources provide the pulses to be input into a NIF-like beamline.

Laser Amplifiers – Mechanical systems that adapt the Multi-Segment-Amplifier of the NIF to a Single-Segment-Amplifier as required by the OMEGA EP architecture.

Power Conditioning – Energy storage system to energize the flash lamps of the laser amplifiers

Opto-Mechanical Beamlines – All lenses, mirrors, deformable mirrors, diffraction gratings, Plasma-Electrode-Pockels-Cells, and laser diagnostics to transport the energy from the laser sources through the amplifiers and to the target.

Experimental, Vacuum Systems, and Structures – The structures, vacuum vessels and interfaces to the Opto-Mechanical systems required for beamline support.

Control Systems – The hardware and software necessary to control the laser through all of the component elements. Remote control from a centralized control room will be provided

Project Justification

The OMEGA laser at the University of Rochester's Laboratory for Laser Energetics (LLE) is a critical facility needed to support ICF goals. The OMEGA Extended Performance (EP) project will provide advanced radiographic capabilities that currently do not exist. This technology will facilitate the longer-term goal of demonstrating ignition and future SSP experiments on the National Ignition Facility (NIF). Specifically, OMEGA EP will provide the following:

- high-energy, short-pulse backlighters necessary for imaging direct-drive ignition implosions along two axes,
- capability to develop weapons science applications of petawatt lasers in areas such as high-energy x-ray backlighting and the production of matter under extreme conditions of temperature and density,
- a unique means for evaluating the fast-ignition concept, which could increase the likelihood of eventually achieving ignition and high gain on the NIF,
- a new capability for exploring basic science through ultrahigh-intensity lasers,

- an important facility upgrade to maintain the vitality of the scientific program at the Laboratory for Laser Energetics, consistent with the recommendation of the recent National Research Council report on High-Energy-Density Physics,

- an important capability to probe matter under extreme astrophysical conditions, consistent with recommendations contained in the recent National Research Council report on the Physics of the Universe, and

- enhanced viability of LLE to support NNSA and attract new talent into the SSP.

Project Scope

The scope of the project includes all of the design, development, and installation of the laser systems. At the conclusion of the project, the primary functional requirements will be met and performance verified by an independent panel. Subsequently, the laser will be available to conduct the ICF missions specified above under separate funding.

Project Milestones:

FY 2004	Establish Performance Baseline / Approve CD-2/3	Q2
FY 2005	Grating Tiling Assembly / Mounts Complete	Q1
FY 2007	Beam 1 fired at low power	Q2
FY 2007	First light to EP TC	Q3
FY 2009	Beam 2 fired at low power	Q2
FY 2009	First light to OMEGA TC	Q1
FY 2009	Achieve laser performance requirements	Q4
FY 2009	Approval of CD-4	Q4

4. Details of Cost Estimate

(dollars in thousands)	Current Estimate	Previous Estimate
Laser Construction Phase		
Special Equipment:		
Laser Sources	4,366	N/A
Laser Amplifiers	3,530	N/A
Power Conditioning	3,655	N/A
Optomechanical Beamlines	12,016	N/A
Experimental Systems	10,219	N/A
Control Systems	5,538	N/A
Total, Special Equipment (58.7% of TEC)	39,324	N/A
Project Office (23.8% of TEC)	15,958	N/A
Total, Laser Construction Costs (82.5% of TEC)	55,282	N/A
Contingency (17.5% of TEC)	11,718	N/A
Total, OMEGA EP (TEC)	67,000	N/A

5. Method of Performance

LLE will execute the project under the terms of the current cooperative agreement with between the University of Rochester and NNSA. LLE's make-or-buy decisions will be made on the basis of cost, schedule, quality, and technical performance. Vendors will be selected based on their ability to offer the best combination of these metrics with the highest probability of success. The preferred method of procurement will be competitive outsourcing using the University's DOE-approved purchasing system. If a satisfactory item or service is not available off-the-shelf, LLE's decision will be to either manufacture to specification, manufacture to print, or make in-house.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Total Estimated Cost	0	13,000	21,000	6,000	27,000	67,000
Other Project Costs						
Conceptual design cost	2,000	0	0	0	0	2,000
NEPA documentation costs	0	2,400	3,300	3,000	0	8,700
Total Other Project Costs	2,000	2,400	3,300	3,000	0	10,700
Total Project Cost (TPC)	2,000	15,400	24,300	9,000	27,000	77,700

7. Related Annual Funding Requirements

(FY 2009 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs	5,000	N/A
Total related annual funding	5,000	N/A

Advanced Simulation and Computing Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Advanced Simulation and Computing Campaign					
Advanced Applications Development	139,380	144,226	150,793	+ 6,567	+ 4.6%
Verification and Validation	40,116	47,675	49,780	+ 2,105	+ 4.4%
Materials and Physics Modeling	66,304	69,291	72,062	+ 2,771	+ 4.0%
Problem Solving Environment (PSE)	38,170	43,982	45,072	+ 1,090	+ 2.5%
Distance Computing (DisCom)	14,803	16,514	17,068	+ 554	+ 3.4%
Pathforward	12,703	17,800	18,000	+ 200	+ 1.1%
Visual Interactive Environment for Weapons Simulation (VIEWS)	57,588	59,791	61,635	+ 1,844	+ 3.1%
Physical Infrastructure & Platforms	76,339	106,977	140,000	+ 33,023	+ 30.9%
Computational Systems	63,883	62,091	64,081	+ 1,990	+ 3.2%
Simulation Support	57,861	58,437	59,413	+ 976	+ 1.7%
Advanced Architectures	3,500	0	3,000	+ 3,000	+ 0.0%
University Partnerships	43,396	47,687	47,980	+ 293	+ 0.6%
ASCI Integration	6,219	9,826	9,148	- 678	- 6.9%
Construction Projects	54,191	37,079	3,228	- 33,851	- 91.3%
Total, Advanced Simulation and Computing Campaign..	674,453	721,376	741,260	+ 19,884	+ 2.8%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Advanced Simulation and Computing Campaign						
Advanced Applications Development	150,793	159,579	166,671	174,080	181,821	832,947
Verification and Validation................	49,780	53,812	56,143	58,579	61,126	279,440
Materials and Physics Modeling.....	72,062	76,304	79,693	83,234	86,936	398,229
Problem Solving Environment (PSE) ..	45,072	47,051	49,119	51,279	53,537	246,058
Distance Computing (DisCom)................	17,068	17,532	18,018	18,525	19,055	90,198
Path forward...........	18,000	15,000	15,000	15,000	15,000	78,000
Visual Interactive Environment for Weapons Simulation (VIEWS).................	61,635	63,374	65,191	67,088	69,073	326,361

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Physical Infrastructure & Platforms................	140,000	164,000	170,000	165,000	165,000	804,000
Computational Systems.................	64,081	65,239	74,241	71,686	69,111	344,358
Simulation Support ..	59,413	60,555	69,540	66,962	64,303	320,773
Advanced Architectures	3,000	3,000	3,000	3,000	3,000	15,000
University Partnerships	47,980	48,564	49,175	49,812	50,479	246,010
ASCI Integration......	9,148	7,499	9,914	9,915	9,915	46,391
Construction...........	3,228	0	0	0	0	3,228
Total, Advanced Simulation and Computing Campaign..............	741,260	781,509	825,705	834,160	848,359	4,030,993

Description

The Advanced Simulation and Computing (ASCI) Campaign's vision for the future is to predict, with confidence, the behavior of Nuclear Weapons, through comprehensive, science-based simulations. In order to achieve this state, ASCI provides leading edge, high-end simulation capabilities needed to meet weapons assessment and certification requirements. These capabilities include developing weapon codes, weapon science, platforms, computer facilities and the necessary support to make the system operate together.

ASCI investments are leveraged with other federal agencies and industrial partners. High-end computing collaborations include: joint efforts with the DOE Office of Science; participation in interagency efforts including DARPA High Productivity Computing Systems, High-End Computing Revitalization Task Force, and the Interagency High-End Computing working group; collaboration through new DoD/DOE/NNSA Memorandum of Understanding; collaboration with the NSA; work with industrial partners on selected path-forward activities.

Benefits to Program Goal 01.31.00.00 Advanced Simulation and Computing

Within the Advanced Simulation and Computing program, 14 subprograms each make unique contributions to Program Goal 01.31.00.00. These include developing weapon codes, weapon science, platforms, computer facilities and the necessary support to make the system operate together.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Demonstrate a computer code capable of performing a three-dimensional analysis of the dynamic behavior of a nuclear weapon primary, including a prediction of the total explosive yield, on an Accelerated Strategic Computing Initiative (ASCI) computer system. (EXCEEDED GOAL)	Meet the FY 2001 ASCI Program Plan milestones for development of modeling and simulation tools and capabilities required for design and certification of the nuclear weapons stockpile. (MET GOAL)	Perform a prototype calculation of a full weapon system with three-dimensional engineering features. (MET GOAL)	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Peer-reviewed progress, according to a schedule in the Advanced Simulation and Computing (ASCI) Campaign Program Plan, toward a validated full-system, high fidelity simulation capability	Completed sufficient milestones to achieve enhanced primary, focused secondary physics capability, and Q user environment.	Complete sufficient milestones to achieve high-fidelity primary simulation and Stockpile to Target Sequence (STS) abnormal environments.	Complete sufficient milestones to achieve high fidelity secondary simulation, Initial Validated (IV) STS hostile environment, IV high-fidelity physics primary, and Red Storm [40 trillions of operations per second (TeraOPS)] user environment.	Complete sufficient milestones to achieve IV focused, high-fidelity physics secondary, and Purple (100 TeraOPS) user environment.	Complete sufficient milestones to achieve IV STS normal environment.	Complete sufficient milestones to achieve initial high-fidelity physics, full-system, Coupled STS abnormal environment, and 200T user environment.	Complete modern baseline of all enduring stockpile systems.	Ongoing
Number of weapon system components, primary/secondary/ engineering system, analyzed using ASCI codes, as part of annual assessments & certifications	Analyzed 7 of 31 weapon systems.	Analyze 10 of 31 weapon systems.	Analyze 12 of 31 weapon systems.	Analyze 16 of 31 weapon systems.	Analyze 21 of 31 weapon systems.	Analyze 27 of 31 weapon systems.	Analyze 30 of 31 weapon systems.	For current measure--31 weapon systems FY 2010
The maximum individual platform computing capability delivered, measured in trillions of operations	Attained maximum individual	Attain maximum individual platform	Attain maximum individual platform	Complete the initial 25% of deliverables	Attain maximum individual platform		Attain maximum individual platform	Ongoing

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
per second (TeraOPS)	platform capacity of 20 TeraOPS (with 22 TeraBytes (TB) memory & 400 TB storage.	capacity of 40 TeraOPS (with 10 TB memory & 240 TB storage.	capacity of 100 TeraOPS (with 50 TB memory & 1 PetaByte (PB) storage.	towards delivery of the 200 TeraOPS system.	capacity of 200 TeraOPS (with 100 TB memory & 4 PB storage.		capacity of 350 TeraOPS.	
Total capacity of ASCI production platforms attained, measured in TeraOPS, taking into consideration procurements & retirements of systems	Attained total production platform capacity of 41 TeraOPS.	Attain total production platform capacity of 75 TeraOPS.	Attain total production platform capacity of 172 TeraOPS.	Attain total production platform capacity of 160 TeraOPS.	Attain total production platform capacity of 360 TeraOPS.	Attain total production platform capacity of 470 TeraOPS.	Attain total production platform capacity of 980 TeraOPS.	Ongoing total capacity of 360 TeraOPS FY 2007
Average cost per TeraOPS of delivering, operating, & managing all Stockpile Stewardship Program production systems in a given fiscal year (EFFICIENCY MEASURE)	Attained average cost of $11.64 M.	Attain average cost of $8.15 M.	Attain average cost of $5.7 M.	Attain average cost of $3.99 M.	Attain average cost of $2.79 M.	Attain average cost of $1.96M.	Attain average cost of $1.37 M.	Ongoing

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Advanced Applications Development	**139,380**	**144,226**	**150,793**

Develops enhanced three-dimensional (3-D) computer codes that provide an unprecedented level of physics and geometric fidelity for full-system, component, and scenario weapons simulations. Delivers these weapons performance, safety, and engineering simulation tools for validation and subsequent use by weapons designers and experimentalists to support the Stockpile Stewardship Program (SSP). Improves, not only the code capabilities, but also the performance and efficiency of the codes on the massively parallel platforms procured by ASCI. FY 2005 activities include initial Directed Stockpile Work (DSW) secondary baseline development and 3-D ASCI simulations supporting a Dual-Axis Radiography Hydrodynamic Test (DARHT) certification experiment, as well as enhanced 3-D primary simulation capability to support Life Extension Programs (LEPs) and demonstration of full-system weapon simulation capability. Also, in FY 2005, applications will deliver new code capabilities for aerodynamics Micro-systems and new algorithms for scalable multi-level solvers are planned.

Verification and Validation (V&V)...............................	**40,116**	**47,675**	**49,780**

Develops and Implements tools to rigorously assess accuracy in physics modeling and computational simulations in order to establish confidence in the simulation used for nuclear weapon certification and for resolving high consequence nuclear stockpile problems. Activities in FY 2005 include: assess the accuracy of improved fidelity engineering shock response calculations; deliver complete end-to-end calculations of a nuclear weapon test for at least two stockpile systems, with the emphasis on validation of the secondary modeling; complete a focused quantitative V&V assessment of the physics and simulation capability used for Enhanced Primary and Complex Safety calculations; support the stockpile life extension program by assessing the computational capabilities supporting development of the W80 system and emphasize capabilities to evaluate two required safety themes. Focus on providing a complete analysis of a primary implosion and burn calculation for at least one stockpile system. Support the W76-1 LEP by conducting validation for blast/impulse in hostile environment.

Materials and Physics Modeling (M&PM)..................	**66,304**	**69,291**	**72,062**

Develops models for physics, material properties and transport processes, which are essential to the simulation of weapons under all conditions relevant to their life cycle. This activity provides the theory, analysis, and modeling necessary to develop such models for integration into advanced application codes. In FY 2005, implementation into ASCI codes of improved failure models validated for several specific materials is planned.

Problem Solving Environment (PSE)............................	**38,170**	**43,982**	**45,072**

Develops a computational infrastructure to allow ASCI applications to execute efficiently on ASCI computing platforms and allows accessibility to these platforms from the scientists' desktops. This computational infrastructure includes local-area networks, wide-area networks, advanced storage facilities, and software development tools. In FY 2005, there will be intensive development, deployment and testing of equipment and systems to enable user environments for the ASCI Red Storm, Purple, Blue Gene (G/L) and Linux clusters.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Distance Computing (DISCOM)	**14,803**	**16,514**	**17,068**

Provides secure, high-speed remote access to ASCI platforms. This distance capability involves the creation of a high-speed, parallel secure architecture (both hardware and software); development and implementation of monitoring and testing capabilities; as well as development of service applications and user support. It also entails partnering with the PSE and VIEWS program elements to integrate services and security functions necessary for efficient remote access. In FY 2005, general release of the ASCI Red Storm distance-computing environment is planned. Additionally, delivery of communication technologies to efficiently integrate ASCI Purple and Blue G/L is planned.

Pathforward...	**12,703**	**17,800**	**18,000**

Stimulates U.S. computer industry in the development and engineering of technology areas such as interconnects, runtime system, visualization, storage, and advanced commercial-off-the-shelf (COTS) technologies needed for future ASCI-class computer systems. Emphasis in FY 2005 will be on file systems, optical switching technology, and open source software needed for future ASCI systems.

The optical switch technology is co-funded hardware with the National Security Agency. Ongoing collaboration with the DOE Office of Science in open source software is important to the application of open source software to high-end computing.

Visual Interactive Environment for Weapon Simulation (VIEWS)..	**57,588**	**59,791**	**61,635**

Research, development, engineering, deployment, and applications support of visualization, data management, and data exploration technology and services to support needs of the nuclear weapon design and analysis community. Equipment procured and deployed includes data and visualization services, archival storage, office displays and visualization facilities. VIEWS staff provide general tool and specialized data analysis support to designers and analysts. There is a large research and development component in VIEWS to develop new capabilities for quantitative and comparative analysis and simulations data discovery to meet future needs of the program. In FY 2005, the deployment of a visualization capability for ASCI Red Storm, Purple and Blue G/L is planned. A specific research and development effort planned will deliver an integrated parallel rendering framework to support ASCI Purple. In addition, a web-based tool will be deployed to improve the efficiency of simulation scientists.

Physical Infrastructure and Platforms (PI&P)............	**76,339**	**106,977**	**140,000**

Acquires the computational platforms to support the Stockpile Stewardship Program. The ASCI Q and subsequent platform contracts include a five-year maintenance contract in the acquisition cost. In FY 2005, the 20 teraOPS ASCI Q will continue to operate as a tri-lab resource; the 40 teraOPS Red Storm system will begin integration and acceptance; and the 100 teraOPS ASCI Purple is scheduled for full delivery and installation.

Computational Systems	**63,883**	**62,091**	**64,081**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Provides the production computational and data storage systems and their networking infrastructure at the three NNSA laboratories. This includes the systems management personnel, maintenance contracts, and capital operating equipment. Maintenance for pre-Q platforms is included in this program element. Efforts in FY 2005 will emphasize different phases of major platform integration into the SSP computational complex. Los Alamos National Laboratory (LANL) will be providing tri-lab computational support on the Q machine. At Sandia National Laboratory (SNL), the Red Storm system will be in its integration phases, and at the Lawrence Livermore National Laboratory (LLNL), delivery and integration of the full Purple system will be the focus. Also in FY 2005, LLNL will be activating the Terascale Simulation Facility (TSF) as the Livermore Computing Center is moved to the new facility.

Simulation Support	**57,861**	**58,437**	**59,413**

Provides support services for computing, data storage, networking, and their users. This includes facilities and operations of the computer centers, user help desk services, training, and software environment development that supports the accessible and reliable operation of high-performance, institutional, and desktop computing resources at the three NNSA laboratories. Emphasis in FY 2005 will be on developing and providing support infrastructure for Red Storm and Purple.

Advanced Architectures	**3,500**	**0**	**3,000**

Addresses the long-term platform risk issues of cost, power, performance and size by studying alternative architectures that have the potential to make future ASCI platforms more cost effective.

Funding in FY 2004 was zeroed in order for the Integrated Computing Systems portion of the program (Physical Infrastructure and Platforms, Computational Systems, Simulation Support and Advanced Architectures) to focus on the Purple and Red Storm procurements. In FY 2005, emphasis will be placed on studying these alternative and Advanced Architectures.

University Partnerships	**43,396**	**47,687**	**47,980**

Funds activities associated with the ASCI Academic Strategic Alliances Program through which five universities are developing new computational frameworks while they pursue scientific advances in several areas that are similar in size, scope and complexity to the stewardship simulation efforts. This effort also funds doctoral fellowships in computational science, as the number of U.S. citizen graduates is otherwise insufficient to meet the increasing ASCI program demands. The ASCI Computer Science Institutes serve as focal points for laboratory-university interactions and foster advanced scientific research at the laboratories. ASCI co-funds the development of critical skills in the area of computational science with the DOE Office of Science.

ASCI Integration...	**6,219**	**9,826**	**9,148**

Supports the One Program/Three Laboratory integration strategy for collaborations across the three laboratories including strategic planning outreach and crosscuts. Specific examples of activities funded include: program wide technical project reviews, Alliance interaction support, implementation and program plan production and contracts office support. Supports Supercomputing Conference research exhibits.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
ASCI Construction..	**54,191**	**37,079**	**3,228**

New Computational Facilities to house the computational capabilities are reaching completion in FY 2005 as well as final funding for the Terascale Simulation Facility (TSF). This profile reflects the approved Project Execution Plans.

Total, Advanced Simulation and Computing Campaign..	**674,453**	**721,376**	**741,260**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Advanced Applications Development** This increase reflects emphasis on development of the codes' capabilities, as well as performance and efficiency of the codes on the ASCI platforms	+ 6,567
▪ **Verification and Validation (V&V)** As development of the ASCI codes mature, verification and validation becomes a more prevalent part of the process. The increase in FY 2005 reflects more V&V involvement	+ 2,105
▪ **Materials and Physics Modeling (M&PM)** The increase supports realization of more complete and complex physics in simulation codes..	+ 2,771
▪ **Problem Solving Environment (PSE)** The increase is related to the additional work associated with the installation of several new platforms and enabling the computing environment for each of those platforms	+ 1,090
▪ **Distance Computing (DISCOM)** The increase can be attributed to the ongoing need to maintain the network among the labs	+ 554
▪ **Visual Interactive Environment for Weapons Simulation (VIEWS)** The increase can be attributed to the ongoing need to maintain and develop visualization capabilities at the labs as new platforms come on-line	+ 1,844
▪ **Physical Infrastructure and Platforms** This increase funds the current procurement of the 40 teraflop ASCI Red Storm (SNL) and 100 teraflop ASCI Purple (LLNL) platforms. This increase in computational capability will allow the improving, modern ASCI codes to be more readily applied to the life extension programs activities and the SSP mission in general..	+ 33,023
▪ **Computational Systems** The increase provides for the integration of several platforms at various stages of delivery and installation, as well as operations of the new Terascale Simulation facility	+ 1,990
▪ **Simulation Support** The increase reflects the increased requirement for supporting a network with several platforms at various stages of delivery and installation	+ 976

	FY 2005 vs. FY 2004 ($000)
▪ **Advanced Architectures**	
The increase in funding reflects the restart of this program to study alternative computational architectures	+ 3,000
▪ **University Partnerships**	
The increase in funding demonstrates the intent to maintain current level of effort.	+ 293
▪ **ASCI Integration**	
The decrease in funding allows for necessary increases in other ASCI activities	- 678
▪ **ASCI Construction**	
The decrease reflects reductions in funding for completion of the Distributed Information Simulation Laboratory (DISL) and the final year of funding for the Terascale Simulation Facility, in-accordance with the approved Project Execution Plans	- 33,851
Total Funding Change, Advanced Simulation and Computing Campaign..............	+ 19,884

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects..........................	4,492	4,627	4,766	+ 139	+ 3.0%
Capital Equipment	71,225	73,362	75,563	+ 2,201	+ 3.0%
Total, Capital Operating Expenses	75,717	77,989	80,329	+ 2,340	+ 3.0%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Unappro-priated Balance
00-D-103, Terascale Simulation Facility (TSF)	91,101	28,859	34,014	24,852	3,228	0
00-D-107, Joint Computational Engineering Laboratory (JCEL)......	28,811	21,855	6,956	0	0	0
01-D-101, Distributed Information Systems Laboratory, (DISL)	36,216	10,695	13,221	12,227	0	0
Total, Construction			54,191	37,079	3,228	0

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

00-D-103, Terascale Simulation Facility, Lawrence Livermore National Laboratory, Livermore, California

Significant Changes

The original FY 2003 appropriation was $35,030,000. This was reduced by $222,000 by a rescission and $794,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The TEC and TPC were reduced accordingly.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2000 Budget Request *(Preliminary Estimate)* ……..	2Q 2000	2Q 2001	4Q 2000	4Q 2004	83,500	86,200
FY 2001 Budget Request …	3Q 2000	3Q 2001	4Q 2001	2Q 2006	89,000	92,200
FY 2002 Budget Request ….	1Q 2001	1Q 2002	2Q 2002	2Q 2006	88,900	92,100
FY 2003 Budget Request *(Title I Baseline)* ……………..	1Q 2001	1Q 2002	3Q 2002	4Q 2006	92,117	95,317
FY 2004 Budget Request ….	1Q 2001	1Q 2002	3Q 2002	4Q 2006	92,117	95,317
FY 2005 Budget Request *(Current Baseline Estimate).*	1Q 2001	1Q 2002	3Q 2002	4Q 2006	91,101	94,301

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
2000	1,970 [a]	1,970	200
2001	4,889 [b] [c]	4,889	4,642
2002	22,000	22,000	12,092
2003	34,014 [d]	34,014	41,180
2004	25,000 [e]	25,000	29,627
2005	3,228	3,228	2,920
2006	0	0	440

3. Project Description, Justification, and Scope

Description

The project provides for the design, engineering and construction of the Terascale Simulation Facility (TSF - Building 453) which will be capable of housing the 100 TeraOps-class computers required to meet the milestones and objectives of the Advanced Simulation and Computing (ASCI) Campaign (previously the Accelerated Strategic Computing Initiative). The building will encompass approximately 253,000 square feet and will contain a multi-story office tower with an adjacent computer center. The Terascale Simulation Facility (TSF) proposed here is designed from inception to enable the very large-scale weapons simulations essential to ensuring the safety and reliability of America's nuclear stockpile. The timeline for construction is driven by requirements coming from the ASCI Campaign within the

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[a] Original appropriation of $8,000,000 was reduced by $30,000 for the FY 2000 rescission enacted by P.L. 106-113 and the remaining value of $7,970,000 was reduced by $6,000,000 as a result of a reprogramming action to fund Stockpile-related workload issues at Los Alamos National Laboratory (LANL).

[b] Appropriation of $5,000,000 was reduced by $100,000 by the Safeguards and Security (S&S) amendment. The comparable S&S amount for FY 2000 for this project was $39,000; the comparable appropriation amount was $1,931,000.

[c] Revised appropriation was $4,900,000. This was reduced by $11,000 by a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act. There is no change to the TEC due to a corresponding increase to the FY 2005 appropriation amount.

[d] Original appropriation was $35,030,000. This was reduced by $222,000 by a rescission and $794,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The TEC and TPC were reduced accordingly.

[e] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

Stockpile Stewardship Program (SSP). The TSF will house the computers, the networks and the data and visualization capabilities necessary to store and understand the data generated by the most powerful computing systems in the world.

Justification

The Advanced Simulation and Computing (ASCI) Campaign has as its mission the acceleration of simulation to meet the demands of the nation's nuclear defense mission. The challenge is to maintain confidence in the nuclear stockpile without nuclear testing. Along with sub-critical experiments, one of the primary tools employed will be three-dimensional (3-D) scientific weapons calculations of unprecedented computational scope. As has been emphasized in the ASCI Campaign Program Plan, it is the rapid aging of both the stockpile and the designers with test experience that is at the heart of the issue and the reason for acceleration. The most critical period is between 2003 and 2010. By 2003, the number of designers with test experience will be reduced by about 50 percent from 1990. By 2010, the percentage will be further reduced (to about 15 percent). By 2003, most of the weapons in the stockpile will be in transition from their designed field life to beyond field life design. By 2010, about half will be in the beyond-field-life design stage. Therefore, some validated mechanism or capability must be available soon to certify the safety and reliability of this aging stockpile. A major element of this capability will be the ASCI applications codes and the associated terascale simulation environment. The ASCI Ccampaign intends by the middle of the decade, to reach a threshold state simulation capability in which the first functional "full system calculation" generation of codes requiring a 100+ TeraOps computer will be used to certify the stockpile. The remaining designers and analysts with test experience will be an indispensable part of this process, because they will validate the models and early simulation results.

The ASCI applications codes and the weapons analysts who make use of these applications require a supporting simulation infrastructure of major proportions, which includes:

1. Terascale computing platforms (ASCI Platforms)
2. A supporting numerical environment consisting of data management, data visualization and data delivery systems (Visual Interactive Environment for Weapons Simulation)
3. Sophisticated computer science and numerical methods research and development teams (ASCI Problem Solving Environment (PSE) and Alliances)
4. A first rate operations, user services and systems team
5. Data and visualization corridor capability including data assessment theaters, high performance desktop visualization systems and other innovative technologies.

To house, organize and manage these simulation systems and services requires a new facility with sufficient electrical power, mechanical support, networking infrastructure and space for computers and staff. The proposed TSF at LLNL will meet these requirements.

Scope

The TSF project will construct a building (Building 453) of approximately 253,000 square feet located adjacent to an existing (but far less capable) computer facility, Building 451, on the LLNL main site. The building will contain a multi-story office tower with an adjacent computer center. The computer center will house computer machine rooms totaling approximately 47,500 square feet. The computer machine rooms will be clear span (without impediments) and of an aspect ratio designed to minimize the maximum distance between computing nodes and switch racks. The ceiling height will be sufficiently high to assure proper forced air circulation. A raised access floor will be provided in order to allow adequate room for air circulation, cabling, electrical, plumbing, and fire/leak detection equipment.

The first computer structure will be available for occupancy in FY 2004. The building will be initially built with enough power and cooling to support two terascale systems, the first to be installed in FY 2004. As a risk reduction strategy, the building will be further designed so that power and mechanical resources can be easily added in the event that systems sited in the future will require higher levels of power. However, it is expected that by the middle of the decade the rate of growth of the peak capability of installed computers will relax. Therefore, the building should have enough power and cooling to accept any system procured after that time.

The TSF will include meeting rooms, offices, and a data and visualization capability. Scientists will be able to utilize innovative visualization technologies, including an Assessment Theater. The theater will be used for both prototyping advanced visualization concepts and ongoing data analysis and data assimilation by weapons scientists. In short, the theater represents the area where physical and computer scientists, working together, will visualize and make accessible to the human eye and mind the huge data sets generated by the computers. This will allow workers to understand and assess the status of the immensely complex weapons systems being simulated.

The office space will accommodate staff and scientists who require access to both classified and unclassified workstations. Vendors, and operational and problem solving environment staff must have immediate access to computer systems, since the simulation environment will require very active support. A key principle underlying all TSF planning is tight coupling between stockpile stewardship elements and the platforms. Thus, the TSF will also house the nucleus of the classified and unclassified (LabNet) networks. To assure the efficient operation of remote Assessment Theaters high speed networking hubs will connect the computers seamlessly to key weapons scientists and analysts at the highest performance available.

Office space vacated by the completion of TSF will be returned to the institution through Space & Site Planning for reassignment or demolition, depending on site-wide needs and the quality of available facilities at that time. Specific impacts of TSF vacancies occurring in FY 2004 to FY 2006 cannot be directly identified at this time, but will be administered by this process and subject to reporting and oversight of the NNSA Livermore Site Office.

Project Milestones

FY 2004:	Computer Area One Complete	3Q
FY 2005:	Office Tower Complete	3Q
FY 2006:	Computer Area Two Complete	3Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications – $4,800)	5,640	5,640
Design Management Costs (0.9% of TEC)	810	810
Project Management Costs (0.6% of TEC)	504	504
Total Design Costs (7.6% of TEC)	6,954	6,954
Construction Phase		
Improvements to Land	1,680	1,510
Buildings	56,190	51,880
Utilities	9,825	9,630
Standard Equipment	0	0
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	4,480	4,516
Construction Management (5.7% of TEC)	5,190	5,175
Project Management (3.5% of TEC)	3,150	3,402
Total Construction Costs (88.4% of TEC)	80,515	76,113
Contingencies		
Design Phase (0% of TEC)	0	0
Construction Phase (4.0% of TEC).	3,632	9,050
Total Contingencies (4.0% of TEC)	3,632	9,050
Total, Line Item Costs (TEC) [a]	91,101	92,117

5. Method of Performance

Design was performed under a negotiated best value architect/engineer contract. Construction and procurement shall be accomplished by fixed-price contracts based on competitive bidding and best value award.

[a] Escalation rates are taken from the DOE Construction Project and Operating Expense Escalation Rate Assumptions, dated January 2001.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Costs						
Design	6,842	0	112	0	0	6,954
Construction	10,092	41,180	29,515	2,920	440	84,147
Total, Line item TEC	16,934	41,180	29,627	2,920	440	91,101
Total Facility Costs (Federal and Non-Federal)	16,934	41,180	29,627	2,920	440	91,101
Other Project Costs						
Conceptual design costs	1,300	0	0	0	0	1,300
NEPA documentation costs	150	0	0	0	0	150
Other project-related costs [a]	930	0	335	280	205	1,750
Total, Other Project Costs	2,380	0	335	280	205	3,200
Total Project Cost (TPC)	19,314	41,180	29,962	3,200	645	94,301

7. Related Annual Funding Requirements

(FY 2006 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs [b]	1,500	1,500
Programmatic operating expenses directly related to the facility [c]	56,200	56,200
Utility costs [d]	8,500	8,500
Total related annual funding (operating from FY 2006 through FY 2025)	66,200	66,200

[a] Including tasks such as Project Execution Plan, Pre-Title I Development, Design Criteria, Safeguards and Security Analysis, Architect/Engineer Selection, Value Engineering Study, Independent Cost Estimate, Energy Conservation Report, Fire Hazards Assessment, Site Surveys, Soil Reports, Permits, Administrative Support, Operations and Maintenance Support, ES&H Monitoring, Operations Testing, Energy Management Control System Support, Readiness Assessment.

[b] Facility operating costs are approximately $ 1,500,000 per year (which also includes facility maintenance and repair costs), when facility is operational in 4th Qtr. FY 2006. Costs are based on the LLNL internal indirect rate Laboratory Facility Charge (LFC) for facility operating costs.

[c] The annual operating expenses for the Terascale Simulation Facility are estimated at $ 56,200,000 based on representative current operating expenses of 300 personnel. The majority of this funding is expected to come from NNSA for activities in support of the nuclear weapons stockpile.

[d] Costs are based on LLNL utility recharge rates.

Pit Manufacturing and Certification Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Pit Manufacturing and Certification Campaign					
W88 Pit Manufacturing.......	109,871	125,035	132,005	+ 6,970	+ 5.6%
W88 Pit Certification...........	105,055	108,592	101,470	- 7,122	- 6.6%
Pit Manufacturing Capability...........................	1,159	10,000	20,992	+ 10,992	+ 109.9%
Modern Pit Facility...............	4,242	10,810	29,800	+ 18,990	+ 175.7%
Pit Campaign Support Activities at NTS................	41,480	42,353	52,206	+ 9,853	+ 23.3%
Total, Pit Manufacturing and Certification Campaign..................................	261,807	296,790	336,473	+ 39,683	+ 13.4%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Pit Manufacturing and Certification Campaign						
W88 Pit Manufacturing..	132,005	132,645	139,870	0	0	404,520
W88 Pit Certification......	101,470	88,861	45,310	15,760	0	251,401
Pit Manufacturing Capability......................	20,992	23,252	34,430	37,385	53,000	169,059
Modern Pit Facility.........	29,800	43,291	94,570	101,434	105,168	374,263
Pit Campaign Support Activities at NTS...........	52,206	35,459	0	0	0	87,665
Total, Pit Manufacturing and Certification Campaign.....................	336,473	323,508	314,180	154,579	158,168	1,286,908

Description

The Pit Manufacturing and Certification Campaign goal is to restore the capability and some limited capacity to manufacture pits of all types required by the nuclear weapons stockpile including planning the design and construction of a Modern Pit Facility (MPF) to support long-term pit manufacturing.

Benefits to Program Goal 01.32.00.00 Pit Manufacturing and Certification

Within the Pit Manufacturing and Certification program, the W88 Pit Manufacturing, W88 Pit Certification, Pit Manufacturing Capability, and Modern Pit Facility (MPF) subprograms each make unique contributions to Program Goal 01.32.00.00. The W88 Pit Manufacturing subprogram goal is to restore the capability to produce W88 pits in limited quantities. The W88 Pit Certification subprogram goal is to confirm the nuclear performance of the W88 pit without underground nuclear testing through a required set of engineering tests and physics experiments in addition to a comprehensive analytical effort to develop a computational baseline that will provide confidence in future simulation capability. The Pit Manufacturing Capability subprogram goal is to establish technologies for the production of the W87 and B61-7 pits. The Modern Pit Facility subprogram goal is to design and build an agile pit manufacturing infrastructure with sufficient capability to provide for the long-term safety and reliability of the Nation's nuclear weapon stockpile. An interim pit manufacturing capability of 10-20 pits per year is currently being re-established at Los Alamos National Laboratory (LANL), but this capability will not be sufficient to support the long-term requirements of the nuclear weapons deterrent.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Number of W88 pits manufactured	-Manufactured first certifiable pit and 1 qualification pit (total 2). -Issued Engineering Release to document completion of the pit qualification plan.	Manufacture 6 certifiable pits (total 8 pits).	Manufacture 6 certifiable pits (total 14 pits).	Manufacture 7 certifiable pits (total 21 pits).	Manufacture 1 War Reserve pit (total 22 pits).			Manufacture 22 Pits FY 2007
Cumulative percentage of major milestones, documented in the Pit Manufacturing and Certification Campaign Program Plan, completed on/ahead of schedule toward restoration of capability to manufacture the pit types in the enduring stockpile in FY 2009 and manufacture initial Engineering Development Units (EDUs) in FY 2012	Implemented integrated technology plan to support recapture of pit manufacturing capability.	Complete initial 5% of major manufacturing capability milestones.	Complete 15% (total 20%) of major manufacturing capability milestones.	Complete 15% (total 35%) of major manufacturing capability milestones.	-Complete 20% (total 55%) of major manufacturing capability milestones. -Establish robust 10 pits per year manufacturing capacity for W88 pits TA-55 at Los Alamos National Laboratory (LANL).	Complete 20% (total 75%) of major manufacturing capability milestones.	Complete 25% (total 100%) of major manufacturing capability milestones.	Establish capability to manufacture the pit types in the enduring stockpile in FY 2009. Manufacture EDUs for B61 and W87 pits by FY 2012

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of major milestones, documented in the Pit Manufacturing & Certification Campaign Program Plan, completed on/ahead of schedule toward FY 2007 W88 Pit Certification	-Completed required engineering certification tests. -Established pit certification peer review process.	Complete 25% of major milestones.	Complete 25% (total 50%) of major milestones.	Complete 25% (total 75%) of major milestones.	-Complete 25% (total 100%) of major milestones. -Issue a major assembly release (MAR) for LANL-built W88 pits.	Complete documentation archives on W88 pit certification.	N/A	Issue a major assembly release (MAR) for LANL-built W88 pits.
Cumulative percentage of major milestones, documented in the Pit Manufacturing & Certification Campaign Program Plan, completed on/ahead of schedule toward completion of the Modern Pit Facility (MPF) (EFFICIENCY MEASURE)	-Completed Draft Environmental Impact Statement for MPF. -Initiated conceptual design of the MPF.	Complete initial 20% of the major milestones required for Critical Decision (CD)-1 approval.	Complete 30% (total 50%) of the major milestones required for CD-1 approval.	Complete 40% (total 90%) of the major milestones required for CD-1 approval.	-Complete 10% (total of 100%)of the major milestones required for CD-1 approval. -Obtain approval of CD-1.	Complete initial 40% of the major milestones required for CD-2 approval.	-Complete 60% (total 100%) of the major milestones required for CD-2 approval. -Obtain approval of CD-2.	Operations startup in 2019. Full production capability achieved in 2021.
Completion of Nevada Test Site (NTS) milestones, documented in the Pit Manufacturing & Certification Campaign Program Plan, completed on/ahead of schedule toward execution of Los Alamos National Laboratory (LANL) major subcritical experiment (SCE) activities in support of the Pit Campaign	Completed all FY 2003 milestones in support of the planned SCEs.	Complete all FY 2004 milestones in support of the planned SCEs.	Complete all FY 2005 milestones in support of the planned SCEs.	Complete all FY 2006 milestones in support of the planned SCEs.				Complete all major SCE activities FY 2006

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
W88 Pit Manufacturing	**109,871**	**125,035**	**132,005**

Following the manufacture of six certifiable W88 pits in FY 2004, at least six certifiable W88 pits will be manufactured in FY 2005. These pits will be used in tests needed to support the goal of FY 2007 W88 pit certification. Restoring the capability to manufacture and certify pits for the nuclear stockpile remains a central challenge of the stockpile stewardship program. Test items other than pits to be used in certification tests will also be manufactured. Additionally, the increased funding for the project supports a multi-year effort by the National Nuclear Security Administration (NNSA) to reorganize activities and process lines at the TA-55 plutonium facility as well as purchase and install new and/or backup equipment necessary to support achievement of a sustained W88 manufacturing capacity. The increased funding also provides for essential improvements to the quality infrastructure to ensure consistency and quality of product at a sustained manufacturing capacity.

W88 Pit Certification	**105,055**	**108,592**	**101,470**

To confirm nuclear performance of the W88 pit without underground nuclear testing, a required set of engineering tests and physics experiments, in addition to a comprehensive analytical effort to develop a computational baseline that will provide confidence in future simulation capability, is required. The major focus of FY 2005 activities is preparation for and conduct of two complex subcritical experiments. The subcritical experimental plan was re-baselined in FY 2003 to support the acceleration of W88 pit certification from FY 2009 to FY 2007. FY 2005 efforts will focus on completing authorization basis activities at the Nevada Test Site, fielding and executing confirmatory experiments, and conducting the live experiments. Current milestones for significant pit certification activities are:

Unicorn Final Dry Run – First Quarter, FY 2005

Kerinei – Preparatory experiment for Krakatau –Second Quarter, FY 2005

Krakatau Final Dry Run – Fourth Quarter, FY 2005

Pit Manufacturing Capability	**1,159**	**10,000**	**20,992**

Pit manufacturing technologies for the W87 and B61-7 pits must be established. These technologies together with the W88 pit manufacturing technology will enable the manufacture of other pit types within the stockpile. Additionally, this technology will support the MPF project design goals that include producing significantly less waste and radiation dose to operators, and operating at a lower cost and more efficiently than a comparable plant with the manufacturing systems used at the Rocky Flats Plant or the plutonium facility at TA-55. Pit Manufacturing Capability is linked via an integrated plan with W88 pit manufacturing and the MPF project to ensure development of technologies, both near and long-term, required to support the nuclear weapons stockpile in manufacture of all pit types.

Modern Pit Facility (MPF)	**4,242**	**10,810**	**29,800**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

The MPF project is developing an agile pit manufacturing infrastructure with sufficient capability to provide for the long-term safety and reliability of the Nation's nuclear weapon stockpile. Since 1989, the United States has been without the capability to produce stockpile-certified plutonium pits that are an essential component of modern nuclear weapons. An interim pit manufacturing capability of 10-20 pits per year is currently being re-established at the Los Alamos National Laboratory (LANL), but this capability is not sufficient to support the long-term requirements of the nuclear weapons deterrent. Planning for a Modern Pit Facility with the capability to meet requirements is essential to establish a viable readiness posture.

Under the National Environmental Policy Act (NEPA) process, if the Secretary of Energy decides to proceed with the MPF project in 2004, a site-specific NEPA process will be initiated in FY2005. Environmental documentation will be prepared in FY 2005 to support a FY 2007 Record of Decision on specific features of a Modern Pit Facility and its exact location on the host site.

Funding in FY 2005 will provide for the continuation of design studies required to complete a Conceptual Design Report (CDR). The CDR will support a Critical Decision (CD)-1 (Critical Decision on System Requirements and Alternatives) in FY 2007. With CD-1 approval, an architect/engineering organization will be selected to initiate preliminary (Title-1) design in FY 2008. Development of the Acquisition Execution Plan required to support solicitation of an architect/engineering organization will be initiated with FY 2005 funding.

The increased funding in FY 2005 also provides for timely evaluation of key technologies prior to decisions that will be made during the final design. MPF activities are being organized consistent with the requirements of a major systems acquisition project, including implementation of an earned value management system.

Pit Campaign Support Activities at NTS	**41,480**	**42,353**	**52,206**

The major activities in FY 2005 include final setup and execution of the major subcritical experiments as defined in the W88 pit certification plan. Specific activities covered include, supporting conduct of the Unicorn experiment in early FY 2005; setting up diagnostic screen rooms and cabling in support of the Kerinei and Krakatau experiments; and potentially mining additional racklet holes for follow-on subcritical experiments. The request also supports development of advanced diagnostic techniques and provides post-shot data analysis capability for all preparatory and actual tests conducted in support of the pit certification project.

Total, Pit Manufacturing and Certification Campaign	**261,807**	**296,790**	**336,473**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **W88 Pit Manufacturing** The increase in funding reflects a significant effort to support the manufacturing needs of pit certification. Installation of additional equipment and removal of old equipment to enable the plutonium facility at LANL TA-55 to achieve, by FY 2007, a sustained manufacturing rate of 10-20 pits/year will continue. Funding will allow manufacturing and quality infrastructure improvements to sustain consistency of the manufactured product. At least 6 certifiable W88 pits will be manufactured in FY 2005	+ 6,970
▪ **W88 Pit Certification** While a significant portion of the design and analysis work for several major experiments is planned to be conducted or completed in FY 2005, a large portion of the preparatory work was funded in prior years. Since the DynEx experiment has been rescheduled, this funding decrease is consistent with present plans. The FY 2005 budget is required to complete planned activities and remain on schedule for FY 2007 completion of certification	- 7,122
▪ **Pit Manufacturing Capability** Funding will be used to ensure progress in re-establishing the capability to manufacture the B61 and W87 pits in FY 2009 and in manufacturing development pits for the B61 and W87 in FY 2012. Restoring this capability is essential to ensure that pits other than the W88 can be manufactured and the process extended to manufacture of other pit types. The technology developed as part of Pit Manufacturing Capability will also be used to make technology decisions for Modern Pit Facility (MPF) and will support MPF goals to significantly reduce the radiation dose to operators as well as the waste that will be produced by the facility. The increase of funding from FY 2004 supports the continued development of existing pit manufacturing processes, including completion of the design of an advanced pit casting and shaping module that supports W87 and B61 manufacture. This work integrates with technology development required for upgrades to TA-55 at LANL and the Modern Pit Facility	+ 10,992
▪ **Modern Pit Facility (MPF)** The funding increase is necessary to support expansion of the scope for design, safety and environmental compliance, technology development, and project management activities that are typical of a multi-billion dollar, major systems acquisition project in the early stages of development. The FY 2005 request will maintain the current baseline schedule to obtain approval for start of operations (CD-4) in FY 2018. FY 2005 is a key year for activities to complete the Conceptual Design Report needed to support a CD-1 decision in early	

	FY 2005 vs. FY 2004 ($000)
FY 2007. The increase in funding also supports development of manufacturing equipment, material transport systems, and other facility support systems required to ensure that the MPF design will be modern, safe, secure, and environmentally compliant. This development is essential for making scheduled design decisions. In addition, a draft environmental impact statement required to support specific host site decisions will be initiated in FY 2005 to maintain scheduled design activities between FY 2007 and FY 2009	+ 18,990
▪ **Pit Campaign Support Activities at NTS**	
The increase will support preparations required to conduct subcritical experiments supporting the W88 pit certification project. In particular, the funding supports the development of the infrastructure for the Unicorn and Krakatau experiments	+ 9,853
Total Funding Change, Pit Manufacturing and Certification Campaign	**+ 39,683**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	7,319	7,538	7,764	+ 226	+ 3.0%
Capital Equipment	18,447	19,000	19,570	+ 570	+ 3.0%
Total, Capital Operating Expenses	25,766	26,538	27,334	+ 796	+3.0%

Major Items of Equipment *(TEC $2 million or greater)*

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Acceptance Date
Assembly Chamber and ancillary infrastructure at LANL	7,573	0	0		3,000	FY 2005
Total, Major Items of Equipment	7,573	0	0	0	3,000	

Description/Justification:

The DynEx Project proposes to procure a transportable, assembly chamber and ancillary infrastructure that house mechanical and electrical equipment supporting assembly operations for experiments vital to the certification process. The DynEx experiment will be assembled, radiographed, and inserted into a confinement vessel within the assembly chamber. The confinement vessel containing the experiment will then be transported to the DARHT firing point. The assembly chamber is required to mitigate the dispersal consequences of an accident where high explosives and special nuclear material are collocated to below the DOE evaluation guidelines. The proposed assembly chamber and the accompanying support trailers will initially be located in the proximity of R 183, Access Control so as to allow second axis commissioning activities at DARHT to proceed unencumbered by the presence of DynEx, yet remain clear of the DARHT hazard circle. In subsequent DynEx experiments, the assembly chamber and the support trailers will be re-located to a site that is in proximity to the DARHT firing point in order to reduce the alignment integrity risk that arises when transporting the confinement vessel containing the experiment from the assembly chamber to the DARHT firing point. After conclusion of the experiment, the assembly chamber and the support trailers will be re-located back to the initial site to allow full flexibility of DARHT operations.

Readiness Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Readiness Campaign					
Stockpile Readiness	36,630	60,628	45,812	- 14,816	- 24.4%
HE & Weapon Operations............	11,742	23,510	34,220	+ 10,710	+ 45.6%
Nonnuclear Readiness.................	20,392	33,202	35,457	+ 2,255	+ 6.8%
Tritium Readiness........................	46,674	59,557	58,850	- 707	- 1.2%
Tritium Readiness Construction...	83,128	74,558	21,000	- 53,558	- 71.8%
Advanced Design & Production Technologies..............................	71,581	77,461	84,788	+ 7,327	+ 9.5%
Total, Readiness Campaign..................	270,147	328,916	280,127	- 48,789	- 14.8%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Readiness Campaign						
Stockpile Readiness..............	45,812	74,999	92,840	94,874	101,931	410,456
HE & Weapon Operations.....	34,220	31,718	23,156	35,081	36,102	160,277
Nonnuclear Readiness..........	35,457	36,770	33,887	45,853	47,268	199,235
Tritium Readiness.................	58,850	73,356	68,059	85,586	91,637	377,488
Tritium Readiness Construction	21,000	24,452	0	0	0	45,452
Advanced Design & Production Technologies......	84,788	89,506	89,441	95,633	99,522	458,890
Total, Readiness Campaign..............................	280,127	330,801	307,383	357,027	376,460	1,651,798

[a] The FY 2004 amount for Stockpile Readiness reflects a comparability adjustment of $5,795,000 moving MIE - Computer Numerical Controller Lathe and Glovebox from Directed Stockpile Work.

[b] The FY 2003 and FY 2004 amounts for Advanced Design and Production Technologies reflect comparability adjustments of $71,581,000 and $77,461,000, respectively moving Advanced Design and Production Technologies from Engineering Campaign.

Description

The Readiness Campaign is an essential component of the Stockpile Stewardship Program with the responsibility for developing or reestablishing new manufacturing processes and technologies for qualifying weapon components for reuse.

The Readiness Campaign is playing a critical role in revitalizing the nuclear weapons manufacturing infrastructure. The investments from this Campaign will improve both the responsiveness for the infrastructure and its technology base. A truly responsive infrastructure is the cornerstone of the new nuclear defense triad as outlined in the Administration's Nuclear Posture Review. To be considered a credible deterrent, this infrastructure must include a manufacturing capability with state-of-the-art equipment combined with cutting-edge applications of technology, and an ability to quickly provide modified or enhanced capabilities and products to meet emerging threats. The Readiness Campaign contributes substantially to these goals.

Following the cessation of the nuclear weapons complex production mission ten years ago, the production sites downsized. As a result, some of the capabilities and capacity need to be reconstituted to produce weapon components and reassemble weapons required to refurbish the stockpile as defined by the Life Extension Programs (LEPs). The gaps in the complex's production readiness capability, which have been evaluated and documented, also reflect the reality that the production capabilities and capacity needed for the future are much different than those used to build the existing stockpile. There are several efforts ongoing to define how the Production Agencies must modernize to establish flexible, agile, lean and efficient production capabilities and capacity. At the same time that the production sites are filling these gaps in production readiness, they must also address the modernization of these capabilities to establish a flexible, agile and efficient production infrastructure that will enable the complex to meet future expectations.

Benefits to Program Goal 01.33.00.00 Readiness Campaign

Within the Readiness Campaign program, five subprograms [Stockpile Readiness, High Explosives and Weapon Operations (HEWO)(previously called High Explosives Manufacturing and Weapon Assembly/Disassembly (HEMWAD)), Nonnuclear Readiness, Advanced Design and Production Technologies (ADAPT), and Tritium Readiness] each make unique contributions to the Program Goal 01.33.00.00. Stockpile Readiness is replacing or restoring Y-12 National Security Complex production capability and revitalizing aging processes. Nonnuclear Readiness provides the electrical, electronic, and mechanical production capabilities required to weaponize a nuclear explosive. Tritium Readiness establishes and operates the Commercial Light-Water Reactor (CLWR) Tritium Production System to produce tritium, maintaining the national inventory of tritium to support the nuclear weapons stockpile. ADAPT activity integrates and systematically develops new technologies and enhanced capabilities to improve the effectiveness of the production complex and to deliver qualified refurbishment products upon demand. HEWO ensures that the capability to requalify nuclear assembly components; manufacture and assemble high explosive components; and to assemble, disassemble, and perform surveillance on nuclear weapons is adequate.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	Meet the FY 2002 milestones in the production readiness campaigns to address issues associated with high explosives, materials, and non-nuclear technologies. (MIXED RESULTS)	**FY 2001 Results** There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Quantity of the major FY 2004-2012 milestones, documented in the Readiness Campaign Program Plan, for advanced design and production technology (ADAPT) development completed on/ahead of schedule, including model-based manufacturing, enterprise integration, and process development	N/A	N/A	Complete initial 18 advanced major technology milestones.	Complete 8 advanced major technology milestones (total of 26).	Complete 6 advanced major technology milestones (total of 32).	Complete 4 advanced major technology milestones (total of 36).	Complete 1 advanced major technology milestone (total of 37).	Complete 37 advanced major technology milestones FY 2009
Quantity of the major FY 2004-2012 milestones, documented in the Readiness Campaign Program Plan, for major manufacturing processes (high explosives and weapon operations, stockpile readiness, and nonnuclear readiness), concerning new/upgraded capabilities completed, including foundry, machining, recovery, assembly, inspection, and verification processes to support stockpile production and Life Extension Program requirements	N/A	Complete initial 5 major manufacturing process milestones.	Complete 8 major manufacturing process milestones (total of 13).	Complete 6 major manufacturing process milestones (total of 19).	Complete 4 major manufacturing process milestones (total of 23).	Complete 1 major manufacturing process milestone (total of 24).	N/A	Complete 27 major manufacturing process milestones FY 2012 (Initial task)
Quantity of coated cladding tubes acquired for Tritium-Producing Burnable Absorber Rods	N/A	Acquire 317 coated cladding tubes (total of 317).	Acquire 620 coated cladding tubes (total of 937).	Acquire 860 coated cladding tubes (total of 1,797).	Acquire 1,000 coated cladding tubes (total of 2,797).			Acquire 1,000 coated cladding tubes FY 2007 (Initial task)

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of Tritium Extraction Facility (TEF) construction phase completed (EFFICIENCY MEASURE)	Completed 50% of TEF construction phase.	Complete 90% of TEF construction phase.	Complete 100% of TEF construction phase.					Complete TEF construction FY 2005
Cumulative percentage of Tritium Extraction Facility (TEF) project completed (total project cost), while maintaining a Cost Performance Index of 0.9-1.15 (EFFICIENCY MEASURE)	Completed 64% of TEF project.	Complete 80% of TEF project.	Complete 87% of TEF project.	Complete 96% of TEF project.	Complete 100% of TEF project.			Complete 100 % of project FY 2007

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Stockpile Readiness	**36,630**	**60,628**	**45,812**

Within this activity, the Y-12 National Security Complex (Y-12) is replacing or restoring production capability and revitalizing aging processes. These efforts will result in Y-12's ability to meets its mission requirements in a more efficient and cost effective manner and provide capability for the future needs of the complex. At present, critical manufacturing capabilities are required for weapons refurbishments planned for FY 2006 and beyond within elements of the production site. The Stockpile Readiness activity is the primary vehicle for this revitalization and is tasked with providing virtually all new processing, machining, and inspection equipment required for the Directed Stockpile Work (DSW) effort needed in the intermediate to long range future. As much of Y-12's current capability is based on 20 to 40 year old technology, the Stockpile Readiness activity is charged with improving basic manufacturing capability and appropriately deploying much needed related technology developed by the ADAPT activity and other technology programs.

In FY 2005, this activity will install the scanning electron microscope, high precision mills, forming equipment, electron beam welder, electro polisher, metal working, and coordinate measuring machines. It will also support intelligent manufacturing, digital radiography, science and model based manufacturing, and certification of key materials.

High Explosives and Weapon Operations	**11,742**	**23,510**	**34,220**

The HEWO activity, formerly High Explosives Manufacturing and Weapons Assembly/Disassembly Readiness, conducted at the Pantex Plant and involving other Nuclear Weapons Complex sites as appropriate, ensures that the capability to requalify nuclear assembly components; manufacture and assemble high explosive (HE) components, both main charge and small energetic; and assemble, disassemble, and perform surveillance on nuclear weapons is adequate to meet the current and projected needs of the nation's nuclear weapon stockpile, consistent with national goals and policies. This activity is planned and structured to address the capability, capacity, infrastructure, workforce and facility issues that must be resolved and will serve as the vehicle to implement technologies demonstrated by other programs.

It will provide the equipment, infrastructure, and workforce required, as well as operating support for construction projects needed to accommodate the new capabilities. This campaign is charged with appropriately deploying much needed related technology developed by the ADAPT activity and other technology programs.

The request in FY 2005 supports the implementation of equipment, and the initial startup activities for HE manufacturing and product requalification. In the HE manufacturing area, technical input will be provided to support the High Explosives Pressing Facility Line Item which has design funding included in 04-D-103, Project Engineering and Design, with a planned construction start of FY 2006. Several large pieces of equipment, HE machining centers, machine controllers that support models-based manufacturing, and test equipment will be implemented in the production environment to begin work on the W76-1/Mk4A. In the product requalification activity, three new capabilities will be demonstrated by ADAPT and transitioned to this program for implementation. Equipment to

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

implement in the production environment will be purchased. The initial start up activities for the pit requalification and surveillance in the Special Nuclear Material Component Requalification Facility (SNMCRF) will be provided. In addition, Information Technology (IT) infrastructure to support science based manufacturing, computing hardware for model-based design simulation and analysis and connectivity to support the enterprise product planning and interactive electronic procedures for weapon assembly and disassembly activities will be implemented.

Nonnuclear Readiness	**20,392**	**33,202**	**35,457**

The Nonnuclear Readiness activity provides the electrical, electronic, and mechanical production capabilities required to weaponize a nuclear explosive. This activity, primarily involving the Kansas City Plant, the Sandia National Laboratories/New Mexico, and the Los Alamos National Laboratory, deploys the product development and production capabilities required to support nonnuclear product requirements. Nonnuclear functions range from weapon command and control to examining performance during deployment simulations, including weapon structural features, neutron generators, tritium reservoirs, detonators and component testers. The Nonnuclear Readiness activity has three major functions: 1) eliminate gaps in product development and production capabilities required to perform the authorized base workload 2) and authorized life extension programs, and 3) achieve operational readiness of all product development and production capabilities as required by the known and anticipated requirements of the Stockpile Stewardship Program. In addition to the major weapon program planning documents, the Applied Technology Roadmap and Responsive Infrastructure information are used as guidance.

In FY 2005, this activity supports the replacement of product testers and the deployment of production equipment required to manufacture and accept new products supporting the Life Extension Programs. Equipment includes electronic component packaging for flight testing, mechanical component fabrication, engineered material production, and material evaluation and qualification. The request also reflects implementation of as-built/design model archiving and transfer capabilities, and automated feature-based manufacturing development, manufacturing, and inspection for production of W76 components.

Tritium Readiness..	**46,674**	**59,557**	**58,850**

The Tritium Readiness activity establishes and operates the Commercial Light-Water Reactor (CLWR) Tritium Production System to produce tritium, maintaining the national inventory of tritium to support the nuclear weapons stockpile. Production of tritium in the Tennessee Valley Authority's (TVA) Watts Bar reactor began in October 2003. Irradiated rods will be removed in FY 2005 and transported to a temporary storage location awaiting completion of the Tritium Extraction Facility (TEF). This action will complete the production-development-and-demonstration portion of the campaign. Tritium will also be produced in subsequent operating cycles of the reactor as required by the stockpile size. Although the TVA's Sequoyah reactors will be capable of tritium production, it will remain in a "stand-by" tritium production mode for the foreseeable future.

Major activities in FY 2005 include: $33.6 million for completion of the first irradiation cycle; initiation of the second irradiation cycle including incremental reactor fuel costs; handling and transportation of irradiated tritium-producing rods; fabrication of rods for the third irradiation cycle;

(dollars in thousands)

and $25.3 million for other project costs (OPC) associated with equipment and systems testing, crew training, and other activities in preparation of the completion and startup of the Tritium Extraction Facility.

	FY 2003	FY 2004	FY 2005
Tritium Readiness Construction	**83,128**	**74,558**	**21,000**

Project 98-D-125, TEF, Savannah River Site will provide the capability to receive and extract gases containing tritium from the CLWR Tritium Producing Burnable Absorber Rods (TPBARs) or other targets of similar design. The TEF will provide shielded remote TPBAR handling for the extraction process, clean-up systems, and delivery of extracted gasses containing tritium to the Tritium Recycle Facility for further processing. The TEF facility construction will be completed in FY 2005 to support start up of facility operations planned to begin in FY 2007. The TEF will provide steady-state production capability of as much as several Kg of tritium per year and will have an operational life span of at least 40 years. This will provide an initial capability. Capacity can be sized as the stockpile requirements change.

	FY 2003	FY 2004	FY 2005
Advanced Design & Production Technologies	**71,581**	**77,461**	**84,788**

The Advanced Design and Production Technologies (ADAPT) activity (previously included under Engineering Campaigns) integrates and systematically develops new technologies and enhanced capabilities to improve the effectiveness of the production complex and to deliver qualified refurbishment products upon demand. Developing fast turn-around-engineering options through virtual prototypes and implementing modern product data management and collaboration tools are a means to achieve this goal. ADAPT's guiding vision for the future is to become an essential resource for identification, development and integration of applied technology capabilities to achieve rapid product realization meeting nuclear weapons complex requirements and related national security needs. ADAPT develops qualified manufacturing processes and capabilities for deployment by other programs for sustained manufacturing. These qualified manufacturing processes support directed production schedules or Life Extension Programs (LEPs).

In FY 2005, ADAPT will balance near term LEP requirements and Advanced Technology Roadmap strategies. Major focus areas for near-term requirements include: developing capabilities and improvements to tritium processing, "Quarter Cost" Arming, Fusing, and Firing W76 subassembly production, hazardous materials production processes, improving secure connectivity of electronic data within the nuclear weapons complex, and developing minimum capability to produce War Reserve mechanical hardware with qualified Model Based processes. Advanced technology focus areas address standardization of nuclear weapons complex business methods and expanding Model Based and Non-contact gauging capabilities.

	FY 2003	FY 2004	FY 2005
Total, Readiness Campaign	**270,147**	**328,916**	**280,127**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Stockpile Readiness**	
In FY 2005, this activity will continue to fund the highest priority projects slated to restore the machining, radiography, inspection, and testing capabilities and equipment required to support LEP baselines.	- 14,816
▪ **HE and Weapon Operations**	
This increase supports the science based manufacturing necessary to meet requirements for the W76-1 and other LEPs. Some of the products include models-based design, engineering, and manufacturing for the B61-7/11; deployment of pit qualification workstations; and models-based product definition for the W76-1	+ 10,710
▪ **Nonnuclear Readiness**	
This increase reflects expanded funding of on-going projects and initial funding of new projects, including neuton generator production testers and process improvements to support replacement or development of production capability at Kansas City Plant, Sandia National Laboratories/New Mexico, and Los Alamos National Laboratory.	+ 2,255
▪ **Tritium Readiness**	
This decrease reflects the Tritium Readiness activity baseline schedule, which completes the transition from the Commercial Light Water Reactor (CLWR) Program, not including the Tritium Extraction Facility (TEF), to full production-scale operation of the tritium production system using a single reactor.	- 707
▪ **Tritium Readiness Construction**	
This decrease is consistent with the baseline goals. It is consistent with the 2nd Quarter FY 2003 baseline for the project and will enable the project to meet its end-point milestones as scheduled	- 53,558
▪ **Advanced Design & Production Technologies**	
This request for additional funding reflects increased work in process development to support tritium consolidation (TCON) plans and the necessary improved capabilities for the Tritium Extraction Facility (TEF), increased work in science-based manufacturing to meet directed stockpile workload needs such as development of new manufacturing techniques for engineering development of stronglink design modifications, new cable testing processes and equipment, and some additional emphasis on raising the minimum level of connectivity and	

	FY 2005 vs. FY 2004 ($000)
capability of the secure, electronic nuclear weapons "enterprise" to improve speed and cycle times of design-to-production for DSW	+ 7,327
Total Funding Change, Readiness Campaign	**- 48,789**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses[a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	27,790	28,624	29,482	+ 858	+ 3.0%
Capital Equipment	31,674	50,000	51,500	+1,500	+ 3.0%
Total, Capital Operating Expenses	59,464	78,624	80,982	+2,358	+ 3.0%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Unappropriated Balance
Project 98-D-125, TEF	408,065	204,485	83,128	74,558	21,000	24,894
Total, Construction			83,128	74,558	21,000	

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

Major Items of Equipment *(TEC $2 million of greater)*

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Acceptance Date
Jig Borer #1	3,100	1,868	-768	2,000	0	FY 2005
Procure and install a high precision mill to replace an obsolete less efficient piece of equipment.						
Disassembly Glovebox ...	15,000	7,900	6,140	960	0	FY 2004
Procure and install a glovebox to support a new production requirement.						
Coordinate Measuring Machine #1...................	7,597	0	3,041	3,400	1,156	FY 2005
Procure and install a CMM to replace obsolete equipment that is no longer supported by the vendor.						
Coordinate Measuring Machine #2...................	4,100	0	200	3,900	0	FY 2005
Procure and install a CMM to replace obsolete equipment that is no longer supported by the vendor.						
Electron Beam Welder....	9,206	0	3,100	6,106		FY 2006
Procure and install an electron beam welder to replace an inoperable piece of equipment.						
Metal Working Equipment	4,782	0	1,178	3,500	104	FY 2006
Procure and install new metal working equipment to meet production requirements.						
Hydroforming Unit	3,295	0	0	2,630	665	FY 2006
Purchase and install a hydroforming unit to meet production requirements.						
Computer Numerical Controller Lathe and Glovebox	8,295	0	0	5,795[a]	2,500	FY 2006
Procure and install CNC lathe and glovebox enclosure for special materials. The existing capability is difficult to maintain, and outdated raising reliability concerns.						
Vacuum Annealing Equipment	3,693	0	0	2,358	1,335	FY 2006
Purchase and install vacuum annealing equipment to meet production requirements.						
Low Energy X-Ray Machine	4,783	0	0	1,643	2,400	FY 2006
Procure and install a low energy X-ray machine to restore a radiography capability.						
Scanning Electron Microscope	8,900	0	1,700	0	2,000	FY 2007
Install a larger chamber Scanning Electron Microscope in order to support a new material specification.						

[a] Reflects a comparability adjustment of $5,795,000 from Directed Stockpile Work.

	(dollars in thousands)					
	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Acceptance Date
Electro Polisher.............	2,681	0	0	778	1,903	FY 2006
Procure and install an electropolisher system. The condition and reliability of the current system has deteriorated as a result of chemical exposure during its 20 years of service.						
Microwave Deployment ..	3,700	0	0	0	500	FY 2006
Procure and install new machine for production use, based on operational lessons learned from prototype installed in 2003.						
2 MeV Linac	2,000	0	0	0	2,000	FY 2006
Procure and install a 2 MeV Linac to replace existing one originally installed in the early 1970's which is no longer supported by the vendor						
9 MeV Linac	3,917	0	0	0	2,000	FY 2007
Procure and install a 9 MeV Linac to replace existing one originally installed in the early 1970's which is no longer supported by the vendor to support production radiography requirements.						
Coordinate Measuring Machine #3...................	5,345	0	0	0	5,345	FY 2007
Procure and install a CMM to replace obsolete equipment that is no longer supported by the vendor.						
Electron Beam Weld Inspection.....................	2,500	0	0	500	1,000	FY 2007
Installs a new, non-destructive analytical and certification capability for the welded components on a major weapons system.						
Total, Major Items of Equipment			14,591	33,570	31,908	

98-D-125, Tritium Extraction Facility, Savannah River Site
Aiken, South Carolina

Significant Changes

- The need to reprogram $10,000,000 into this project in FY 2003 was identified in the FY 2004 Congressional Budget request. However, as a result of recent project developments in the disposal options for the extracted Tritium Producing Burnable Absorber Rods, part of this requirement was deferred, and the FY 2003 reprogramming, which was approved, was reduced to $5,000,000.

- The funding profile has been adjusted to move $15,000,000 from FY 2005 to FY 2006 to reflect NNSA's need to address high priority requirements in FY 2005, including implementation of the new Design Basis Threat (DBT). The risk to the successful completion of the project from this funding shift is minimal.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 1998 Budget Request *(Preliminary Estimate)*…………….	1Q 1998	4Q 2002	1Q 1999	3Q 2005	TBD [a]	TBD
FY 2000 Budget Request………..	1Q 1998	3Q 2001	1Q 2000	4Q 2004	285,650	390,650
FY 2001 Budget Request *(Revised Baseline Estimate)*…….	1Q 1998	3Q 2001	1Q 2000	4Q 2004	323,000	401,000
FY 2002 Budget Request………..	1Q 1998	3Q 2001	1Q 2000	4Q 2004	323,000	401,000
FY 2003 Budget Request………..	1Q 1998	3Q 2001	1Q 2000	4Q 2004	323,000	401,000
FY 2004 Budget Request *(Performance Baseline)*…………...	1Q 1998	3Q 2001	1Q 2000	4Q 2007	408,065	506,439
FY 2005 Budget Request………..	1Q 1998	3Q 2001	1Q 2000	4Q 2007	408,065	506,439

[a] Consistent with OMB Circular A-11, Part 3, full funding was requested for only preliminary and final design of the Commercial Light Water Reactor Tritium Extraction Facility in FY 1998.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
1998	9,650	9,650	6,911
1999	6,000	6,000	5,889
2000	32,875 [a]	32,875	32,003
2001	74,835 [b]	74,835	56,618
2002	81,125	81,125	74,392
2003	83,128 [c]	83,128	88,311
2004	75,000 [d]	75,000	78,500
2005	21,000	21,000	40,989
2006	24,452	24,452	22,452
2007	0	0	2,000

3. Project Description, Justification, and Scope

Tritium is a radioactive isotope of hydrogen used in all of the Nation's nuclear weapons. Without tritium, nuclear weapons will not work as designed. At present, no tritium is produced by the U.S. for the nuclear weapons stockpile. Radioactive decay depletes the available tritium by approximately 5.5% each year. In order for these weapons to operate as designed, tritium must be periodically replaced. Although tritium has not been produced by the U.S. for the stockpile since the shutdown of the last production reactor in 1988, tritium requirements have been met through reuse of tritium recovered from dismantled weapons. To replenish the tritium needs of the nuclear weapons stockpile, a new production capability is required to be on line by 2007, in accordance with the President's 1996 Nuclear Weapons Stockpile Memorandum. To meet this date, site preparation and construction of the Tritium Extraction Facility (TEF) began in FY 2000. As part of the dual track production strategy, stated in the Record of Decision for the Tritium Supply and Recycling Final Programmatic Environmental Impact Statement, issued on December 5, 1995, the Commercial Light Water Rector (CLWR) Tritium Extraction Facility shall be constructed at the Savannah River Site (SRS). The CLWR TEF shall provide the capability to

[a] The original appropriation was $33,000,000. This was reduced by $125,000 by the FY 2000 rescission enacted by P.L. 106-113.

[b] The original appropriation was $75,000,000. This was reduced by $165,000 by a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[c] The original appropriation was $70,165,000. This was increased by a reprogramming of $10,000,000 from prior year funding which was requested in FY 2002, but not approved until December 2002, and by an FY 2003 reprogramming of $5,000,000. The appropriation was reduced by $446,000 by a rescission and by $1,591,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title, VI.

[d] The FY 2004 appropriated amount has not been adjusted for the FY2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

receive and extract gases containing tritium from CLWR Tritium Producing Burnable Absorber Rods (TPBARs), or other targets of similar design. The TEF will provide shielded remote TPBAR handling for the extraction process, clean-up systems to reduce environmental impact from normal processing and accidental releases, and delivery of extracted gases containing tritium to the Tritium Recycle Facility for further processing.

The facility includes two major buildings: (1) a 15,250 (approx) square foot Remote Handling Building (RHB) and (2) a 26,500 (approx) square foot Tritium Processing Building (TPB). The TPB will be built above ground, while the RHB will be partially below ground. Major processes and operations systems included within the TEF will be: (1) the Receiving, Handling, and Storage System that will support all functions related to the receipt, handling, preparation, and storage of incoming TPBAR and outgoing radioactive waste materials; (2) the Tritium Extraction System that will perform initial cleanup of extracted gasses; (3) the Tritium Process Systems that will separate process gases from the irradiated TPBARs; (4) the Tritium Analysis and Accountability Systems that will support monitoring and tritium accountability; (5) the Solid Waste Management System that will receive solid waste generated by TEF for management and storage prior to disposal in the E-Area vaults, which will be upgraded by TEF to accommodate that disposal; and (6) the Heating, Ventilation, and Air Conditioning System that would provide and distribute conditioned supply air to the underground RHA and the above ground tritium processing area and also discharge exhaust air to the environment via a 100-foot stack.

The TEF will provide steady-state production capability to the existing SRS tritium facility of as much as 3Kg of tritium per year, if needed. Final purification of gases containing tritium shall be performed in the augmented process equipment located in the existing SRS tritium facility.

The TEF shall have an operational life span of at least 40 years, minimize radiological and chemical releases to the environment; and minimize waste generation. The security requirements shall be such that TEF is designated as an exclusion area.

Project Milestones

As baselined, the operation of the TEF will be dependent on the completion and operation of the Tritium Facility Modernization and Consolidation Project. With this project being completed during 3rd Quarter, FY 2005, the final tritium systems will be available for processing extraction gases to ensure weapons stockpile requirements will be met in CY 2007.

FY 1998: Initiation of Preliminary Design (Complete)
Completion of Preliminary Design (Complete)
FY 1999: Critical Decision (CD) 2B Approval to Begin Final Design (Complete)
Initiation of Final Design (Complete)
CD-3 - Approval to Begin Construction (Complete)
FY 2000: Initiation of Site Preparation (Complete)
FY 2001: Completion of Final Design (Complete)
Completion of Site Preparation (Complete)
Initiation of Facility Construction (Complete)
FY 2005: Completion of Facility Construction (Final system turnover to startup testing)

FY 2007: Initiation of Integrated System Testing with Tritium
Project Completion
CD-4 - Start of Facility Operation

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design Costs (Design Drawings, Specifications and Construction Support)	62,268	62,268
Design Management Costs (0.4% of TEC)	1,649	1,649
Project Management Costs (1.4% of TEC)	5,872	5,872
Total, Design Costs (17.1% of TEC)	69,789	69,789
Construction Phase		
Improvements to Land	6,801	6,801
Buildings	124,083	124,083
Special Equipment	85,178	85,178
Standard Equipment	8,403	8,403
Major Computer Items	7,630	7,630
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	26,173	26,173
Construction Management (3.5% of TEC)	14,307	14,307
Project Management (4.3% of TEC)	17,619	17,619
Total, Construction Costs (71.1% of TEC)	290,194	290,194
Contingencies		
Construction Phase (11.8% of TEC)	48,082	48,082
Total, Contingencies (11.8% of TEC)	48,082	48,082
Total, Line Item Costs (TEC)	408,065	408,065

5. Method of Performance

The Savannah River Site Managing and Operating (M&O) Contractor, Westinghouse Savannah River Company (WSRC), will be responsible for the design, construction, inspection and commissioning of the TEF to be built at the Savannah River Site. All conceptual, preliminary, and detail design work has been completed by site forces. Site preparation and construction of the Civil/Structural portion of the project has been completed. The remainder of the plant construction is in progress by the Savannah River Site M&O contractor, with a portion of the work awarded to fixed price subcontractors. System turnover to startup testing will begin in 2003, with turnover of the electrical system, and will run through 2006. The remainder of the plant construction will be completed in FY 2005. Final startup testing with radioactive gases will be performed by site forces beginning in FY 2007.

6. Schedule of Project Funding [a]

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	132,510	32,310	8,700	5,500	3,344	182,364
Construction	43,303	56,001	69,800	35,489	21,108	225,701
Total, Line Item TEC	175,813	88,311	78,500	40,989	24,452	408,065
Other Project Costs						
Conceptual design cost	3,541	0	0	0	0	3,541
NEPA documentation costs	1,858	0	0	0	0	1,858
Other project-related costs	11,163	3,719	17,500	24,600	35,993	92,975
Total Other Project Costs	16,562	3,719	17,500	24,600	35,993	98,374
Total Project Cost (TPC)	192,375	92,030	96,000	65,589	60,445	506,439

[a] Design includes cost of engineered equipment.

7. Related Annual Funding Requirements

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Annual facility operating costs	1,750	1,750
Annual facility maintenance/repair costs	2,800	2,800
Programmatic operating expenses directly related to the facility	7,600	7,600
Capital equipment not related to construction but related to the programmatic effort in the facility	800	800
GPP or other construction related to the programmatic effort in the facility	450	450
Utility costs	1,050	1,050
Total related annual funding (operating from FY 2006 through FY 2045)	14,450	14,450

Readiness in Technical Base and Facilities

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Readiness in Technical Base and Facilities					
Operations of Facilities	995.602	1.021.715	1.017.557	- 4.158	- 0.4%
Program Readiness [a,b]………………	129.158	115.754	106.204	- 9.550	- 8.3%
Special Projects [b]…………………….	38.791	41.274	20.534	- 20.740	- 50.2%
Material Recycle and Recovery	93.132	75.740	86.965	+ 11.225	+ 14.8%
Containers	20.655	15.915	17.910	+ 1.995	+ 12.5%
Storage	12,534	11,298	18,982	+ 7,684	+ 68.0%
Subtotal. Operations & Maintenance	1.289.872	1.281.696	1.268.152	13.544	-1.1%
Construction	191.000	258.949	206.302	- 52.647	- 20.3%
Total. Readiness in Technical Base and Facilities....................................	1,480,872	1,540,645	1,474,454	-66,191	-

[a] Beginning in FY 2005, efforts related to maintaining the readiness of the Nevada Test Site to conduct underground nuclear tests, if directed, have been moved from the Readiness in Technical Base and Facilities Program Readiness activity to the Primary Technologies component of the Science Campaign ($30,000,000 in FY 2005). FY 2003 and FY 2004 comparability adjustments are $17,940,000 and $24,744,000 respectively.

[b] Beginning in FY 2005, Criticality Safety will shift from Special Projects to Program Readiness within the Readiness in Technical Base and Facilities program ($10,626,000 in FY 2005). FY 2003 and FY 2004 comparability adjustments are $9,271,000 and $10,122,000 respectively.

[c] Nuclear Weapons Incident Response (NWIR) formerly funded under RTBF is being proposed in FY 2005 as a separate control line. Funds transferred from RTBF are $81,114,000 in FY 2003, $89,167,000 in FY 2004, and $99,209,000 in FY 2005.

FYNSP Schedule
(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Readiness in Technical Base and Facilities						
Operations of Facilities...	1,017,557	1,058,844	1,119,410	1,125,421	1,178,799	5,500,031
Program Readiness.......	106,204	111,067	108,285	113,225	117,399	556,180
Special Projects............	20,534	21,326	22,065	23,266	23,933	111,124
Material Recycle and Recovery......................	86,965	73,333	86,708	98,873	102,374	448,253
Containers.....................	17,910	16,117	16,688	19,091	17,772	87,578
Storage..........................	18,982	17,462	18,020	20,922	21,493	96,879
Construction..................	206,302	304,073	382,041	438,468	453,984	1,784,868
Total, Readiness in Technical Base and Facilities	1,474,454	1,602,222	1,753,217	1,839,266	1,915,754	8,584,913

Description

The Readiness in Technical Base and Facilities (RTBF) Program operates and maintains National Nuclear Security Administration (NNSA) program facilities in a safe, secure, efficient, reliable and compliant condition so that they are operationally ready to execute nuclear weapons stockpile stewardship tasks on-time as identified by the Directed Stockpile Work and Campaign programs. This includes program contractor facility operating costs (e.g. utilities, equipment, facility personnel, training, and salaries); facility and equipment maintenance costs (staff, tools, and replacement parts); environmental, safety, and health costs; the capability to recover and recycle plutonium, highly-enriched uranium, and tritium to support a safe and reliable nuclear stockpile; specialized storage containers sufficient to support the requirements of the nuclear weapons stockpile; and the design and construction of facilities which support the nuclear weapons complex. To accomplish this mission, the NNSA must reverse the deterioration of its nuclear weapons infrastructure, restore lost production capabilities, and modernize selected facilities in order to conduct scheduled refurbishments.

In addition, the NNSA must become more responsive to current and future national security challenges. This includes revitalizing the nuclear weapons infrastructure. As highlighted by the Nuclear Posture Review, a highly responsive infrastructure itself can become part of a credible deterrent to our adversaries. RTBF plays a central role in this effort and must continue to invest in improving the efficiency of the NNSA facilities and the strengthening of the technical base.

The RTBF Program works in close partnership with the FIRP to assure the facilities and infrastructure of the nuclear weapons complex are restored and thereafter maintained in appropriate condition to support the mission. RTBF provides funding for maintenance of the complex and making capital investments to sustain the complex into the future. These efforts focus on ensuring that facilities necessary for immediate programmatic workload activities are maintained sufficiently to support that workload. FIRP addresses the additional sustained investments above the RTBF base for deferred maintenance and infrastructure that are needed to extend facility lifetimes, reduce the risk of unplanned system and equipment failures, increase operational efficiency and effectiveness, and allow for Recapitalization of aging facility systems. FIRP also manages utility line items to further reduce the deferred maintenance backlog and disposes of excess facilities that have been deactivated. As discussed elsewhere in the budget, FIRP is a capital renewal and sustainability program that was established principally to reduce the large backlog of deferred maintenance, which had developed during the 1990s to an appropriate level consistent with industry best practices. FIRP supports this goal by developing corporate facility management practices required to properly maintain the complex and also provides additional funding dedicated to reducing deferred maintenance, recapitalizing the infrastructure, and reducing the maintenance base by eliminating excess real property. RTBF provides funding for maintenance of the complex and making capital investments to sustain the complex into the future. FIRP is scheduled to be complete in 2011. Between now and the time FIRP is completed, the NNSA must institutionalize responsible and accountable facility management practices and provide funding levels needed to sustain the complex at industry standard best practice levels or better. Although not yet quantified, it is anticipated that RTBF funding levels for maintenance, capital renewal, and disposition of excess real property will need to increase from present levels.

Benefits to Program Goal 01.34.00.00 Readiness in Technical Base and Facilities (Operations)

Within the Readiness in Technical Base and Facilities (RTBF) program, six subprograms each make unique contributions to Program Goal 01.34.00.00. Operations of Facilities operates and maintains "NNSA-owned" programmatic capabilities in a state of readiness, ensuring each capability (workforce and facility) is operationally ready to execute programmatic tasks identified in Campaigns and Directed Stockpile Work (DSW). Program Readiness supports selected activities that support more than one facility, Campaign, or Directed Stockpile Work (DSW) activity, and are essential to achieving the objectives of the Stockpile Stewardship Program. Special Projects provides for activities that require special control or visibility, or do not fit easily into other budget categories, including landlord cost associated with conveyance and transfer of land at LANL to the County of Los Alamos and San Ildefonso Pueblo. In addition, Special Projects supports pension liabilities, special access programs, systems engineering support, information system upgrades, and engineering and technical support for RTBF activities. Material Recycle and Recover is responsible for the recycle and recovery of plutonium, enriched uranium, and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and components. Containers responds to the need of the nuclear weapons complex by providing directive approved containerization research and development, design, certification, re-certification, test and evaluation, production and procurement, fielding and maintenance, and decontamination and disposal, and off-site transportation authorization of nuclear materials and components transportation containers. Storage provides effective storage and management of national security and surplus pits, highly enriched uranium (HEU), and other weapons and nuclear materials in compliance with DOE/NNSA requirements.

Program Assessment Rating Tool (PART)

The Office of Management and Budget (OMB) used PART to review this program for the FY2005 budget. NNSA received a final rating of 75% for Readiness in Technical Base and Facilities, Operation of Facilities, which is Moderately Effective on the OMB rating scale. OMB found that the program has recently developed long-term performance goals against which it can measure its success. OMB concluded that the program does not yet have an established track record against those goals that would support a rating higher than "moderately effective." In response to these recommendations, NNSA management is actively monitoring performance against goals and targets through the PPBE process.

Congressional Interest

Consistent with Section 3114 of the Conference Report accompanying the National Defense Authorization Act for FY 2004, P.L. 108-136, below are definitions by functional category and the statement of amounts requested in FY 2005.

Functional Category Definitions:
Maintenance - includes costs associated with maintenance activities that are required to sustain property, plant, and equipment in a condition suitable for it to be used for its designated purpose. Maintenance activities include, Preventive Maintenance, Predictive Maintenance, Corrective Maintenance, Maintenance Management, and General Maintenance.

Facilities Management and Support - includes costs associated with facilities and their ability to function effectively, such as plant and maintenance engineering, facilities utilization analysis, modification and upgrade analysis, facilities planning and condition determinations, and rental of buildings/land. Does not include construction and maintenance costs.

Utilities - includes utility-related engineering associated with labor, operating plants and equipment, contract services for fuel, water treatment chemicals, or support needed to provide electric power, heat, steam, chilled water, portable water, process gases, and sanitary waste disposal to support business and research. This element includes all costs associated with contract services in support of utilities, such as fuel, water treatment chemicals, and control systems (also includes energy management related activities). Utilities include, Central Steam Facility, Central Chilled Water Facility, Water Supply System, Sanitary Waste Disposal System, and Electrical Power.

Environment, Safety and Health - includes environmental costs associated with the development, implementation, and maintenance of effluent controls, environmental monitoring, and surveillance, permitting, auditing and evaluation to assure environmental compliance, and pollution prevention. These activities, performed on a routine basis, are necessary to maintain compliance with federal, state, and local regulations, as well as applicable DOE Orders and directives. Includes safety and health costs associated with safety and health programs, such as preparation of work authorizations, emergency preparedness, fire protection, industrial hygiene, industrial safety, occupational medical services, nuclear safety, work smart programs, radiation protection, transportation safety, and management oversight.

Other Project Cost (OPC) - includes costs related to a project that is not represented in the Total Estimated Cost (TEC). OPC activities include, but are not limited to project activities such as Conceptual Design Plans and reports, Project Execution Plans, NEPA documentation, construction project data sheets, maintenance procedures (to support facility startup), initial operator training, commissioning costs, operational readiness reviews and documentation, and operating procedures (to support facility startup).

Demolition, Decontamination, Deactivation and Decommissioning of Excess Facilities - includes the deactivation cost planned for decontamination and disposition of excess DOE weapons production facilities, equipment and land. Included are costs associated with preparing a facility for: 1) transition to the Environmental Management Program as required in the Life Cycle Assets Management Directive, and, 2) surveillance and maintenance of those facilities (required to maintain the facility in a safe condition). These costs should be identifiable for both contaminated and non-contaminated facilities. Also included, are costs associated with the development of technology for the reclamation of buildings, equipment and land, so that they may be used for other purposes.

Capital Equipment - includes equipment that is not purchased as part of a line item project or is not attributed to a specific weapon production program

General Plant Projects (GPP**) - i**ncludes construction projects that are neither line item projects or attributed to a specific weapon production program. Includes miscellaneous minor new construction projects of a general nature, the total estimated cost of which may not exceed the statutory limit of $5 million.

Expense Funded Projects (EFP) - includes construction and rearrangement projects paid for with expense funds and are not attributed to a specific weapon production program. Examples of project activities funded with operating dollars include normal maintenance and repair, such as painting, cleaning, and small repair jobs not resulting in an addition, replacement of a retirement unit, or a betterment.

These categories do not represent the official budget or accounting structure for the Operations of Facilities activities. As such, the data was developed by cross walking the NNSA sites operations of facilities costs, funded in Weapons Activities, into categories consistent with the definitions above.

FY 2005 RTBF Operations of Facilities
(dollars in thousands)

Maintenance	196,694
Facilities Management & Support	445,944
Utilities	64,989
Environment, Safety & Health	174,280
Other Project Costs	27,047
Demolition, Disposal or Transfer of Excess Facilities	6,425
Capital Equipment (CE)	21,668
General Plant Projects (GPP)	19,303
Expense Funded Projects (EFP)	61,207
Total, Operations of Facilities	1,017,557

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Targets
Ensure that all facilities required for successful achievement of the Stockpile Stewardship Program remain operational. (BELOW EXPECTATIONS: Operations at LANL were severely impacted by the Plutonium intake accident and the Cerro Grande fire at LANL.)	Complete the milestones listed in the corrective action plan for the Departmental challenge of managing physical assets.	Meet established facility operating plans and construction schedules to ensure the physical infrastructure and facilities are operational, safe, secure, and compliant, and that a defined state of readiness is sustained at all needed facilities. This includes addressing safety issues to allow restart of the Y -12 enriched uranium reduction process. (MET GOAL)	Meet established facility operating plans and construction schedules to ensure the physical infrastructure and facilities are operational, safe, secure, and compliant, and that a defined state of readiness is sustained at all needed facilities. (MET GOAL)
Meet the established schedules for downsizing and modernizing our production facilities. (MIXED RESULTS)			

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Annual percentage of scheduled days that mission-essential facilities are available (EFFICIENCY MEASURE)	Mission-essential facilities were available 96.5% vs. > 90%	Mission-essential facilities are available >90%.	Mission-essential facilities are available >90%.	Mission-essential facilities are available>90%	Mission-essential facilities are available >90%.	Mission-essential facilities are available >90%.	Mission-essential facilities are available >90%.	Ongoing
Number of Reportable Accidents/200,000 hours of work [vs., Bureau of Labor Statistics (BLS) national standard] (EFFICIENCY MEASURE)	Reportable accidents were 2.2 per 200,000 work hours	Reportable accidents are <6.4 per 200,000 work hours.	Reportable accidents are <6.4 per 200,000 work hours.	Reportable accidents are <6.4 per 200,000 work hours.	Reportable accidents are <6.4 per 200,000 work hours.	Reportable accidents are <6.4 per 200,000 work hours.	Reportable accidents are <6.4 per 200,000 work hours.	Ongoing
Annual NNSA complex-wide aggregate Facility Condition Index (FCI), deferred maintenance costs per replacement plant value, for all mission-essential facilities and infrastructure (the industry standard is below 5%) (EFFICIENCY MEASURE)	N/A	Achieve FCI < 10%.	Achieve FCI < 9%	Achieve FCI < 8%	Achieve FCI < 7%	Achieve FCI < 6%	Achieve FCI < 5%	FCI < 5% FY 2009 (Current Target)

Benefits to Program Goal 01.35.00.00 Readiness in Technical Base and Facilities (Construction)
The RTBF program is composed of independent projects that are created to address specific needs. Each line item gets independently reviewed and funded by Congress based on the mission need identified in the Construction Project Data Sheet submitted to Congress. Currently the RTBF Construction program is comprised of the following 31 independent construction projects: 05-D-140, Project Engineering & Design, VL; 05-D-401, Bldg 12-64 Upgrade, PX; 05-D-402, Beryllium Capability Project, Y-12; 04-D-101, Test Capabilities Revitalization, Phase I, SNL; 04-D-102, Exterior Communications Infrastructure Modernization, SNL; 04-D-103, Project Engineering and Design, VL; 04-D-125, Chemistry and Metallurgy Research (CMR) Facility Replacement, LANL; 04-D-126, Building 12-44 Production Cells Upgrade, PX; 04-D-127, Capability for Advanced Loading Missions (CALM), SRS; 04-D-128, TA-18 Mission Relocation Project, LANL; 03-D-102, National Security Sciences Bldg (LANL Administration Building – 04-D-104), LANL; 03-D-103, Project Engineering and Design, VL; 03-D-121, Gas Transfer Capacity Expansion, KC; 03-D-122, Purification Facility, Y-12; 03-D-123, SNM Component Requalification Facility, PX; 02-D-103, Project Engineering and Design, VL; 02-D-105, Engineering Technology Complex Upgrade, LLNL; 02-D-107, Electrical Power Systems Safety, Communications and Bus Upg., NV; 01-D-103, Project Engineering and Design, VL; 01-D-107, Atlas Relocation to the Nevada Test Site, NV; 01-D-124, Highly Enriched Uranium Materials Facility, Y-12; 01-D-126, Weapons Evaluation Test Laboratory, SNL; 01-D-800, Sensitive Compartmented Information Facility, LLNL; 99-D-103, Isotope Sciences Facility, LLNL; 99-D-104, Protection of Real Property (Roof Reconstruction, PH II), LLNL; 99-D-125, Replace Boilers and Controls, KC; 99-D-127, SMRI-Kansas City Plant, KC; 99-D-128, SMRI-Pantex Plant, PX; 98-D-123, SMRI-Tritium Facility Modernization and Consolidation, SR; 96-D-102, Stockpile Stewardship Facility Revitalization, Phase VI, VL; and 88-D-122, Facilities Capability Assurance Programs, VL.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Targets
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Number of projects initiating designs/ attaining Critical Decision (CD)-1] or cancelled for cause	Initiated design (CD-1) on 2 projects.	Initiate design (CD-1) on, or cancel for cause, 11 projects.	Initiate design (CD-1) on, or cancel for cause, 5 projects.	Initiate design (CD-1) on, or cancel for cause, 4 projects.	Initiate design (CD-1) on, or cancel for cause, 3 projects.	Initiate design (CD-1) on, or cancel for cause, TBD projects.	Initiate design (CD-1) on, or cancel for cause, TBD projects.	Ongoing
Number of projects initiating construction/attaining CD-3, or cancelled for cause	Initiated construction (CD-3) on 3 projects.	Initiate construction (CD-3) on, or cancel for cause, 8 projects.	Initiate construction (CD-3) on, or cancel for cause, 3 projects.	Initiate construction (CD-3) on, or cancel for cause, 7 projects.	Initiate construction (CD-3) on, or cancel for cause, 5 projects.	Initiate construction (CD-3) on, or cancel for cause, 5 projects.	Initiate construction (CD-3) on, or cancel for cause, 2 projects.	Ongoing
Number of construction projects completed/attained CD-4 within approved scope, cost, and schedule baselines (EFFICIENCY MEASURE)	Completed construction (CD-4) on 3 projects.	Complete construction (CD-4) on 9 projects.	Complete construction (CD-4) on 5 projects.	Complete construction (CD-4) on 5 projects.	Complete construction (CD-4) on 4 projects.	Complete construction (CD-4) on 2 projects.	Complete construction (CD-4) on TBD projects.	Ongoing

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Operations of Facilities..	**995,602**	**1,021,715**	**1,017,557**

Operates and maintains "NNSA-owned" programmatic capabilities in a state of readiness, ensuring each capability (workforce and facility) is operationally ready to execute programmatic tasks identified in Campaigns and Directed Stockpile Work (DSW). Operates the program infrastructure and facilities in a safe, secure, reliable, and "ready for operations" manner. Facility-specific activities include, but are not limited to, maintenance; utilities; environment, safety and health; implementation plan actions to address some of the Defense Nuclear Facilities Safety Board (DNFSB) recommendations, and implementation of rules (such as the new Safety Bases Rule 10CFR830, Nuclear Safety Management); and maintenance of the authorization basis (AB) documentation for each facility. Infrastructure support activities include facility-related costs which are not associated with the ongoing operations of facilities such as conceptual design reports, other project related costs for line items, National Environmental Policy Act (NEPA) activities, institutional capital equipment and general plant projects; Stockpile Management Restructuring Initiative which includes operating support costs related to production facility downsizing such as component rebuilds, process transfer/downsizing, qualification and process prove-in, and facility shutdown; and facility startup/standby/Decommissioning & Decontamination (D&D) which includes costs associated with maintaining facilities in a standby status for possible further use, or decontaminating and decommissioning.

Maintains current and future operations with smaller workforce, growing maintenance needs, and increasing regulatory requirements. Provides new and upgraded facilities and capabilities. Seeks cost efficiencies through the consolidation of facilities and functions. Develops an integrated maintenance program that includes elements of RTBF Operations of Facilities for routine maintenance and the Facilities and Infrastructure Recapitalization Program for backlog reduction and extraordinary maintenance items that are impacting cost and performance.

	FY 2003	FY 2004	FY 2005
▪ **Kansas City Plant**..	**92,889**	**103,445**	**101,775**

Operation of the Kansas City Plant provides infrastructure support to manufacturing and engineering activities for a broad array of DSW weapons programs, and technology development and deployment activities in Engineering and Readiness campaigns.

	FY 2003	FY 2004	FY 2005
▪ **Lawrence Livermore National Laboratory**	**54,468**	**41,939**	**54,765**

Funds activities at LLNL including, but not limited to building and building system maintenance; utilities; maintenance of programmatic equipment; environment, safety and health; implementation plan actions addressing the Defense Nuclear Facilities Safety Board (DNFSB) recommendations; implementation of rules (such as the new Safety Bases Rule 10CFR830, Nuclear Safety Management); infrastructure support; and Other Project Costs (OPCs) for RTBF line item construction projects. Facilities include the Nuclear Materials Technology Program (NMTP) facilities (Superblock); the hydrotest bunkers and engineering test facilities at Site 300; the Linear

Accelerator (LINAC) (B194) and light gas guns (B341); the High Explosive Applications Facility (HEAF); and Management & Operating activities at the Nevada Test Site.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
▪ **Los Alamos National Laboratory**	**300,999**	**314,107**	**318,913**

Funds warm standby work including, conventional facility management, infrastructure and utilities, as well as operation & maintenance of special equipment. This activity also includes: infrastructure support, other project costs (OPCs), General Plant Project (GPP) Construction, Monitoring Wells, Beryllium Rule, and Program Management. Facilities directly supported include: Engineering, Tritium, Dynamic Experimentation, Los Alamos Neutron Science Center (LANSCE), Waste Management, Nuclear Materials Technology (TA-55), the Chemical Metallurgy Research Facility (CMR), Beryllium Technology, Nuclear Materials Storage, and Critical Experiments Facility (TA-18).

▪ **Nevada Test Site**..	**86,496**	**88,964**	**70,180**

Funds NTS key facility activities including, sub-critical experiments at U1a, dynamic materials property experiments at Joint Actinide Shock Physics Experimental Research (JASPER) Facility, nuclear material handling and weapons incident response at the Device Assembly Facility (DAF), and pulsed power experiments at Atlas. Specific facilities supported include the Device Assembly Facility (DAF); U1a Complex; Joint Actinide Shock Physics Experimental Research Facility (JASPER), Control Point Complex, Atlas, High Explosive Facility, Bechtel Nevada Los Alamos Technical Facility, Bechtel Nevada Livermore Technical Facility, and the North Las Vegas Complex.

▪ **Pantex Plant**..	**114,996**	**98,190**	**97,741**

Operations of Facilities includes the cost of all structures, equipment, systems, materials, procedures and facility support personnel necessary to provide program sponsors with a facility that is safe, secure, reliable and "ready for operations." This includes support services related to the conduct of safe facility or activity operations, such as maintenance workers, radiological control technicians, general engineering support staff, environment, safety and health professionals, and other workers conducting facility readiness activities.

▪ **Sandia National Laboratories**..................................	**146,928**	**151,072**	**150,710**

Operates the Defense Program-critical programmatic capabilities and associated facilities in warm standby mode. Provides the staff required to keep the capability operational. The capabilities and associated facilities include: Tech Area III Full Scale Test, Microelectronics Development Laboratory, Compound Semi-conductor Laboratory, Experimental Aerodynamics (Wind Tunnel), Tech Area IV Accelerators, Tech Area V Reactors, Tonopah Test Range, Z Accelerator (Z) single shift operations and Z refurbishment, Nanosciences Laboratories, Electromagnetic Test Facilities, Process and Environmental Test Laboratories, California Environmental Test Facilities, Albuquerque Environmental Test Facilities, Neutron Generator Production Facility, and Primary Standards Laboratory.

▪ **Savannah River Site**..	**83,192**	**78,016**	**95,173**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Operations of Facilities include facilities management and support activities that maintain the facilities and infrastructure in a state of readiness for mission operations. Preventive, predictive, and corrective maintenance of process and infrastructure equipment/facilities is performed. Environmental, safety, and health activities are conducted to ensure the well being of SRS workers, the public, and the environment. Contracted costs of providing utilities to the Tritium Facility are included, as well as Other Project Costs associated with RTBF line item projects. Capital equipment and general plant projects that meet base maintenance and infrastructure needs are planned and executed to maintain safety.

▪ **Y-12 National Security Complex**............................	**109,021**	**117,625**	**98,194**

Provides operational and maintenance costs for the following "mission essential" buildings: 9201-1, 9201-5, 9201-5N, 9202, 9204-2, 9204-2E, 9204-4, 9206, 9212, 9215, 9720-5, 9995, and 9998. Includes activities required for continuous operations of each building and specific upgrade projects related to non-routine repairs, maintenance or alteration of the facility and facility systems. Also includes specific environment, safety and health activities such as development of new authorization basis documentation, and implementation of the Fire Protection Program Comprehensive Corrective Action Plan, as well as OPCs for construction line items.

▪ **Institutional Site Support**	**6,613**	**28,357**	**30,106**

Supports prioritized activities across the nuclear weapons complex: DNFSB activities for materials such as inactive actinides, $6.0 million; corporate initiatives that support activities that include occurrence reporting systems and quality assurance working groups, $8.0 million; the TA-18 line item OPCs, $5.0 million; and other unforeseen issues that affect site operations for activities that include monitoring wells, TRU waste acceleration, general plant projects, capital equipment, and other institutional costs, $11.1 million.

Program Readiness...	**129,158**	**115,754**	**106,204**

Supports selected activities that support more than one facility, Campaign, or Directed Stockpile Work (DSW) activity, and are essential to achieving the objectives of the Stockpile Stewardship Program. Ongoing activities include: manufacturing process capabilities required to support the stockpile, critical skill needs, and pulsed power science and technology.

Nevada Site readiness activities include logistical support for laboratory staff permanently located in Nevada, including facilities, equipment, and administrative and technical support. Efforts related to offsite monitoring, weather, cultural resources, hydrology and geology are also supported. Legacy compliance for environmental issues that resulted from years of nuclear testing activities in Nevada are addressed as well as regulatory requirements and efforts to avoid potential compliance orders. The Federal Facility Agreement and Consent Order and the Legacy Rehabilitation projects continue to be supported in FY 2005, along with historical archiving and seismic monitoring activities. The Borehole Management Program will continue to close the remaining unutilized NTS legacy boreholes at a closure rate of approximately 60 boreholes per fiscal year. The NTS Equipment Revitalization Program will continue to replace and modernize NTS equipment that is obsolete.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Pulsed Power Sciences, Microsystems, and Other Technical Support activities provide the infrastructure readiness required to support activities directly related to the construction or tooling necessary for the successful deployment of microsystems in nuclear weapons; maintain the capabilities to design and improve pulsed power machines in support of Inertial Confinement Fusion, weapon physics and weapon effects; and support defense nuclear materials stewardship to research, develop, test, and evaluate advanced technologies for material management systems to enhance the safety, security, and accountability of nuclear weapons and materials during storage, handling, and transportation.

This activity supports the hiring of individuals with the critical skills needed to sustain production and engineering capabilities in support of Directed Stockpile Work at three primary production sites without a major source for these skills. In FY 2005, personnel would perform technical apprenticeships, and knowledge preservation and development projects.

Beginning in FY 2005, support for the conduct of Nuclear Criticality Safety Program (NCSP) in support of DNFSB Recommendation 97-2 is funded at $10.6 million in Program Readiness instead of Special Projects to align the work being performed to the appropriate program activity. In FY 2005, the criticality safety program reflects the NNSA's designation as the Department of Energy's criticality program manager. Previously, multiple program sponsors funded this infrastructure program. The NCSP maintains nuclear criticality skills and technical capability necessary to support all operational criticality safety programs in the Department's nuclear facilities.

Beginning in FY 2005, Test Readiness will be funded in the Science Campaign under Primary Assessment Technologies at $30.0 million in the request.

Special Projects	**38,791**	**41,274**	**20,534**

Special Projects provides for activities that require special control or visibility, or do not fit easily into other budget categories, including support of $3.95 million for Landlord costs associated with conveyance and transfer of land at LANL to the County of Los Alamos and San Ildefonso Pueblo, as directed by P.L. 105-119; and other support of $7.55 million for pension liabilities, special access programs, systems engineering support, and information system upgrades. Also provides $9.03 million for engineering and technical support for RTBF activities including independent and internal reviews, condition assessment surveys, and independent cost estimating requirements.

Material Recycle and Recovery	**93,132**	**75,740**	**86,965**

The Material Recycle and Recovery activity provides for the recycle and recovery of plutonium, enriched uranium, and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and components. It supports the implementation of new processes or improvements to existing processes for fabrication and recovery operations and for material stabilization, conversion, and storage. It supports the process of recycling and purifying the above materials to meet specifications for safe, secure, and environmentally acceptable storage, including meeting the directive schedule for tritium reservoir refills.

The RTBF Material Recycle and Recovery activity includes the response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendations 94-1, 97-1, and 2000-1; uranium stabilization/decontamination/repackaging; nuclear materials information management; a small amount of generic criticality safety support, and nuclear materials planning and reporting. Materials Recycle and Recovery is principally accomplished at the Y-12 National Security Complex (Y-12), Los Alamos National Laboratory (LANL), and Savannah River Site (SRS) Tritium Facility.

At Y-12, Materials Recycle and Recovery includes the following major activities: Head End Processing, Purification and Conversion to UO3, Acid Removal and Waste processing, Conversion of Enriched Uranium Oxide to Metal Buttons, Material Transport and Storage, Processing Enriched Uranium Chips and Scraps, Chemical Conversion of Lithium, and Salvage Operations and Filter Teardown. All of these activities are required to provide materials needed for Stockpile Management and to assure safe and secure handling of materials on-site. In addition, Material Recycle and Recovery includes the Central Scrap Management Office (CSMO) that manages the receipt, storage, and shipment of enriched uranium scrap, the Precious Metals Business Center, which provides a cost effective service to many users within the DOE complex, and deactivation of building 9206.

At the LANL, the Material Recovery and Recycle activity includes: Nuclear Material Processing, including plutonium stabilization and repackaging and operation of the Special Recovery Line; Nuclear Materials Information Management, including Integrated Nuclear Material Information System and the Laboratory Information Management System. The material stabilization and repackaging effort addresses safety concerns raised by the DNFSB in recommendations 94-1 and 2000-1. It focuses on stabilization of plutonium bearing items in the TA-55 and CMR vaults by various means including aqueous and pyrochemical processing. The Special Recovery Line provides the nation's only capability to process tritium contaminated pits. The line is used to disassemble and decontaminate the pits for disposal or re-use and is vital in support of pit storage at the Pantex Site. The line may process 10-12 pits per year. The Highly Enriched Uranium (HEU) activity decontaminates plutonium contaminated HEU shells and converts the uranium metal to oxide for shipment to Y-12. This activity also processes HEU parts from other activities at LANL (such as the SRL pit surveillance) to prevent the accumulation of materials in the TA-55 vault.

(dollars in thousands)

At the SRS Tritium Site, Material Recovery and Recycling includes recovery and purification of tritium, deuterium, and helium-3 gases from reservoir recycle gas and facility effluent cleanup systems. This activity also processes materials received from other sites and performs enrichment of gas mixtures to support the Limited Life Component Exchange mission.

	FY 2003	FY 2004	FY 2005
Containers	**20,655**	**15,915**	**17,910**

The Containers activity includes container research and development, design, certification, re-certification, test and evaluation, production and procurement, fielding and maintenance, and decontamination and disposal, and off-site transportation authorization of nuclear materials and components transportation containers. Life extension program required shipping containers are funded under the Directed Stockpile Work program. It supports current and future operations in the face of a smaller workforce, increasing maintenance requirements, and ever more stringent safety regulations providing new and upgraded containers that meet modern safety performance standards for transport of hazardous materials. Efforts will include efficiencies provided by close coordination of planning and operations with users/customers minimizing the number of new specialized containers by developing new container systems that can accept a broader array of contents with improved safety, security and maintainability. In FY 2005, it includes the development of the DPP-1, the multi-actinide and high activity modification to the ES-3100 and adding additional contents to the DPP-2. Includes the establishment of a container inventory tracking system and database so that packaging inventories can be tracked and managed with much greater efficiency throughout the weapons complex.

	FY 2003	FY 2004	FY 2005
Storage	**12,534**	**11,298**	**18,982**

The Storage activity provides effective storage and management of national security and surplus pits, highly enriched uranium (HEU), and other weapons and nuclear materials in compliance with DOE/NNSA requirements. This includes the cost of receipt, storage, and inventory of nuclear materials, non-nuclear materials, HEU, enriched lithium, and components from dismantled warheads. It does not include the cost of temporary storage of materials waiting processing, staging for dismantlement, or any other interim storage. The storage program also provides programmatic planning for nuclear material requirements, including analysis, forecasting, and reporting functions as well as demand analysis for nuclear materials as designated by the NNSA or other drivers.

FY 2005 increase represents increased material characterization and significant scope increase to develop and begin implementation of the Highly Enriched Uranium Manufacturing Facility (HEUMF) Transition Plan.

	FY 2003	FY 2004	FY 2005
Construction	**191,000**	**258,949**	**206,302**

The Construction program includes the cost of new and ongoing line-item construction projects that support the nuclear weapons complex, except for the major programmatic specific projects that support specific campaigns. RTBF Construction projects range from complex, state-of-the-art

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

facilities and advanced scientific and technical tools, to replacement facilities and basic infrastructure. The RTBF Construction program is focused on two primary objectives: (1) identification, planning and prioritization of the projects required to support the weapons programs, and (2) development and execution of these projects within approved cost and schedule baselines. Both are critical to ensure a reliable nuclear weapons stockpile.

To effectively support both the near and long-term needs of the weapons complex, the RTBF Construction program must be flexible and responsive to diverse and evolving program and facility requirements. The Integrated Construction Program Plan (ICPP), established in FY 2002 by the Deputy Administrator for Defense Programs and the Associate Administrator for Facilities and Operations, is the planning and prioritization document that integrates the line item construction plans included in the sites' Ten Year Comprehensive Site Plans with the Future-Years Nuclear Security Program (FYNSP). Through the ICPP and associated processes, NNSA ensures the construction program is appropriately aligned and integrated with validated program requirements, and resources are optimally allocated to individual projects based on established priorities and demonstrated readiness.

Total, Readiness in Technical Base and Facilities........	**1,480,872**	**1,540,645**	**1,474,454**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Operations of Facilities**	
Kansas City Plant - decrease reflects a Congressional add-on in the FY 2004 appropriation	- 1,670
Lawrence Livermore National Laboratory - increase provides necessary funding to more fully address DNFSB, 10CFR830, and other compliance requirements	+ 12,826
Los Alamos National Laboratory - increase reflects additional effort to improve maintenance of mission essential facilities and infrastructure and implementation of nuclear safety controls associated with DNFSB, 10CFR830.	+ 4,806
Nevada Test Site – decrease in funding is associated with the additional Congressional funding provided in the FY 2004 appropriation for continued facility upgrades, refurbishments, operations and maintenance costs associated with and for the National Center for Combating Terrorism (NCCT)	- 18,784
Pantex Plant – decrease reflects a Congressional add-on in the FY 2004 appropriation	- 449
Sandia National Laboratories - decrease reflects a Congressional add-on in the FY 2004 appropriation	- 362
Savannah River Site - increase is primarily due to shutdown, de-inventory, and deactivation of 232-H to prepare it for long-term surveillance and maintenance, start of operations in 234-7H, and restoration of Capital Equipment and General Plant Projects funding to meet requirements	+ 17,157
Y-12 National Security Complex – decrease reflects a Congressional add-on in the FY 2004 appropriation as well as a reduction in ES&H projects assuming that 10CFR830 compliant Authorization Basis documentation completes in FY 2004. Funding for line item related Other Project Costs (OPCs) and Pre-conceptual Planning as well as partial reduction to 9206 Deactivation reflects the deferral of some projects to the outyears to support higher priority RTBF work scope	- 19,431
Institutional Site Support – increase supports DNFSB concerns for materials such as inactive actinides and other emerging issues related to operating and maintaining nuclear facilities	+ 1,749
Total, Operations of Facilities	**- 4,158**

▪ **Program Readiness**

Net decrease is associated with decreased work scope at NTS for the Borehole Management Program, Equipment Revitalization, and the Chronic Beryllium Disease Prevention Program (CBDPP) Implementation project; partially offset by

	FY 2005 vs. FY 2004 ($000)
increased funding for SNL Pulse Power Sciences and Microsystems activities consistent with FY 2004 Milestones	- 9,550
▪ **Special Projects**	
Decrease reflects a Congressional add-on in the FY 2004 appropriation as well as the elimination of funding for the Laboratory Critical Skills Development program and the Los Alamos County School District and Los Alamos National Laboratory Foundation	- 20,740
▪ **Material Recycle and Recovery**	
Increase is associated with the establishment of Enriched Uranium production capability; the initiation of Salvage operation and filter tear down; and a slight increase in Material Transport and MRR Exhaust Systems, which provide for the handling and storage of in-process materials	+ 11,225
▪ **Containers**	
Increase is attributed to an increase in the quantity of containers to be certified; Safety Analysis Report-Packages documentation; and initiation of DOE Order 461.1 Implementation Plan	+ 1,995
▪ **Storage**	
Increase represents material characterization and significant addition of scope to develop and begin implementation of the Highly Enriched Uranium Manufacturing Facility (HEUMF) Transition Plan	+ 7,684
▪ **Construction**	
Decrease supports mortgages for ongoing construction projects at planned levels and supports funding needed to continue or complete design for projects initiated under Project Engineering and Design in FY 2001-2004. FY 2005 funding is also requested to initiate design for four new subprojects: DX High Explosives Characterization, LANL; Test Capabilities Revitalization, Phase II, SNL; Component Evaluation Facility, PX, and the Albuquerque Transportation and Technology Center, AL. Finally, FY 2005 funding is requested to initiate two new line item construction projects: 05-D-401, Bldg 12-64 Upgrade, PX to complete modifications necessary to allow Pantex the ability to conduct nuclear explosive operations on any weapon program, in any bay, at any time; and 05-D-402, Beryllium Capability Project, Y-12 to replace existing facilities and equipment that are obsolete and inadequate to meet program and ES&H requirements	- 52,647
Total Funding Change, Readiness in Technical Base and Facilities	**- 66,191**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [a]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	27,790	28,624	29,482	+ 858	+ 3.0%
Capital Equipment	31,078	32,010	32,971	+ 961	+ 3.0%
Total, Capital Operating Expenses	58,868	60,634	62,453	+ 1,819	+ 3.0%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)[b]	Prior-Year Approp-riations	FY 2003	FY 2004 [c]	FY 2005	Unapprop-riated Balance
05-D-140, Project Engineering & Design, VL	42,800	0	0	0	11,600	31,200
05-D-401, Bldg 12-64 Upgrade, PX	30,976	0	0	0	25,100	3,000
05-D-402, Beryllium Capability Project, Y-12	40,000	0	0	0	3,627	28,673
04-D-101, Test Capabilities Revitalization, Phase I, SNL	40,931	0	0	36,235	0	0
04-D-102, Exterior Communications Infrastructure Modernization, SNL	22,494	0	0	19,882	0	0

[a] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on actual FY 2003 obligations.

[b] For projects executed utilizing Project Engineering and Design (PED) funding, the TEC reflected in this table is the full project TEC, which includes the design funding that was appropriated PED line items: 01-D-103, 02-D-103, 03-D-103 and 04-D-103.

[c] The FY 2004 amounts reflected in this table include the anticipated government-wide rescission of .59 percent. No changes were made to the individual construction project data sheets pending enactment of the rescission and an evaluation of its impact on the individual projects and formal approval of any resulting baseline changes.

(dollars in thousands)

	Total Estimated Cost (TEC)[b]	Prior-Year Approp-riations	FY 2003	FY 2004 [c]	FY 2005	Unapprop-riated Balance
04-D-103, Project Engineering and Design, VL................	3,500	0	0	3,543	1,500	0
04-D-125, Chemistry and Metallurgy Research (CMR) Facility Replacement, LANL	500,000	0	0	9,941	24,000	441,559
04-D-126, Building 12-44 Production Cells Upgrade, PX..........................	13,948	0	0	8,728	2,600	0
04-D-127, Capability for Advanced Loading Missions (CALM), SRS	37,220	0	0	2,734	0	24,336
04-D-128, TA-18 Mission Relocation Project, LANL	TBD	0	0	8,768	0	TBD
03-D-102, National Security Sciences Bldg (LANL Administration Building – 04-D-104), LANL.......	99,000	0	11,652	49,705	37,348	0
03-D-103, Project Engineering and Design, VL................	33,276	0	7,431	10,545	15,275	0
03-D-121, Gas Transfer Capacity Expansion, KC	16,266	0	3,975	11,233	0	0
03-D-122, Purification Facility, Y-12........................	37,977	0	28,184	0	0	0
03-D-123, SNM Component Requalification Facility, PX...............	20,813	0	6,620	7,583	4,602	0

(dollars in thousands)

	Total Estimated Cost (TEC)[b]	Prior-Year Approp-riations	FY 2003	FY 2004 [c]	FY 2005	Unapprop-riated Balance
02-D-103, Project Engineering and Design, VL [d]	27,755	13,542	15,222	10,891	5,250	3,150
02-D-105, Engineering Technology Complex Upgrade, LLNL	26,700	4,674	4,600	9,718	5,400	0
02-D-107, Electrical Power Systems Safety, Communications and Bus Upg., NV	16,313	3,451	7,282	2,870	0	0
01-D-103, Project Engineering and Design, VL................	TBD	41,522	0	1,591	6,000	TBD
01-D-107, Atlas Relocation to the Nevada Test Site, NV	16,272	10,989	4,097	0	0	0
01-D-124, Highly Enriched Uranium Materials Facility, Y-12..........................	211,898	17,710	24,140	44,735	64,000	61,313
01-D-126, Weapons Evaluation Test Laboratory, SNL.........	22,126	10,693	8,595	2,821	0	0
01-D-800, Sensitive Compartmented Information Facility, LLNL.........................	24,318	14,986	9,332	0	0	0
99-D-103, Isotope Sciences Facility, LLNL.........................	17,342	13,356	3,986	0	0	0
99-D-104, Protection of Real Property	18,384	10,471	4,413	3,479	0	0

[d] Funding amounts do not reflect $6,205,000 of prior year funding and $10,936,000 of FY 2003 funding that has been reprogrammed for OVEC in FY 2004 or is planned for reprogramming to meet the Department's commitment for EEOICPA, nor the future planned reallocation of funding from Building 12-44 Production Cells Upgrade subproject (-$1,518,000); the LIGA Technologies Facility subproject (-$1,000,000); and the Beryllium Capability subproject (-700,000). The TEC assumes approval of all of these.

(dollars in thousands)

	Total Estimated Cost (TEC)[b]	Prior-Year Approp-riations	FY 2003	FY 2004 [c]	FY 2005	Unapprop-riated Balance
(Roof Reconstruction, PH II), LLNL...............						
99-D-125, Replace Boilers and Controls, KC............................	16,237	14,271	1,966	0	0	0
99-D-127, SMRI-Kansas City Plant, KC............................	117,749	76,349	28,925	12,403	0	0
99-D-128, SMRI-Pantex Plant, PX........	13,206	12,811	395	0	0	0
98-D-123, SMRI-Tritium Facility Modernization and Consolidation, SR	113,308	103,132	10,176	0	0	0
96-D-102, Stockpile Stewardship Facility Revitalization, Phase VI, VL........................	71,271	68,725	994	1,544	0	0
88-D-122, Facilities Capability Assurance Programs, VL			9,015	0	0	0
Total, Construction.....			191,000	258,949	206,302	

Major Items of Equipment *(TEC $2 million or greater)*

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	Acceptance Date
Automated Storage and Retrieval System (AS/RS).........	3,120	0	0	0	3,120	FY 2006
Total, Major Items of Equipment	3,120	0	0	0	3,120	

KC-Description/Justification: This project is required to procure and install an additional automated storage and retrieval system (AS/RS). The existing AS/RS is the main storage facility for 70% of the Kansas City Plant production inventory part numbers. The key complex of storage equipment is the focal point for the timely receipt and disbursal of parts and assemblies that support production operations. The existing equipment is at capacity and additional automated storage space is required. The automated process is 40% more efficient than manual shelving and will store four times as much material per square foot. The Stockpile Management Restructuring Initiative (SMRI) emphasis on consolidation of plant inventories and the continuing downsizing of the physical plant has resulted in inventory levels that exceed the capacity of the existing stores areas. The new AS/RS will accommodate this inventory in a reduced area. It will be installed adjacent to the existing system. The existing system will remain operational to support current operations.

05-D-140, Project Engineering and Design (PED) - RTBF, Various Locations

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) a
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2005 Budget Request *(A-E and technical design only)*…………………	1Q 2005	1Q 2008	1Q 2006	4Q 2010	42,800

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2005	11,600	11,600	8,700
2006	19,500	19,500	18,400
2007	11,700	11,700	13,700
2008	0	0	2,000

3. Project Descriptions, Justification, and Scope

This project provides for Architect-Engineering (A-E) services for Readiness in Technical Base and Facilities (RTBF) construction projects, allowing designated projects to proceed from conceptual design into preliminary design and final design. The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

New FY 2005 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of preliminary and final design and engineering efforts for each subproject are provided, as well as very

[a] The Total Estimated Cost (TEC) is for design only for the subprojects currently included in this data sheet.

preliminary estimates of the Total Estimated Cost (TEC), including physical construction, of each subproject. The final TEC and the Total Project Cost (TPC) for each project described below will be validated and the Performance Baseline will be established at Critical Decision 2 (CD-2), following completion of preliminary design.

FY 2005 Proposed Design Projects

05-01: DX High Explosives Characterization Project, LANL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2005	4Q 2005	1Q 2006	3Q 2007	2,000	25,000-40,000

Fiscal Year	Appropriations	Obligations	Costs
2005	2,000	2,000	1,600
2006	0	0	400

This project is necessary to maintain and improve the high explosives characterization, analytical, and experimental capabilities at Los Alamos National Laboratory (LANL). Existing facilities are obsolete, unreliable, and are increasingly expensive to operate. This project will make operations more efficient and reliable through provision of a modern facility, which will consolidate operations and functions from the existing 25 facilities and structures. Operating costs will be reduced, and working conditions for occupants will be drastically improved. Replacing many administrative controls with engineered controls and systems will enhance safety for occupants and environmental compliance.

The DX High Explosives Characterization Project will design and construct a replacement analytical chemistry facility. The replacement facility will consolidate mission critical operations necessary for continued support of the Stockpile Stewardship Mission. It will contain roughly 43,000 square feet of high explosive analytical chemistry facilities and support space, which is approximately the same that is currently contained in 25 separate structures. It will be constructed at Technical Area (TA)-22, near the existing facilities.

The existing structures and facilities, which will no longer be required as a result of the consolidation, will be decommissioned and demolished under the Facilities and Infrastructure Revitalization Program (FIRP).

05-02: Test Capabilities Revitalization (TCR) Project, Phase II, SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2005	4Q 2007	1Q 2007	4Q 2010	7,200	60,000-70,000

Fiscal Year	Appropriations	Obligations	Costs
2005	1,600	1,600	1,600
2006	4,500	4,500	4,000
2007	1,100	1,100	1,600

Phase II of the Test Capabilities Revitalization (TCR) project is required to revitalize the NNSA aged and deteriorated normal and abnormal mechanical environment test capabilities at Sandia National Laboratories (SNL) and to enable an integrated experimental strategy to develop, validate, and apply models required to perform weapon system qualifications and development activities. The facilities to be revitalized are needed to perform nuclear weapon component-, subsystem- and system-level design, development, qualification, surveillance, significant finding investigations, and model development and validation experimentation and testing.

The TCR test capabilities needs are driven by three overarching and equally important requirements. The first requirement is to maintain and modernize the existing stockpile as defined in the current *Nuclear Weapons Stockpile Memorandum*. This encompasses all maintenance and stockpile surveillance activities, as well as Significant Finding Investigations. This requirement also includes Phase 6.2 and 6.3 development efforts that result in weapons modifications or alterations for correcting stockpile defects or for providing life extensions. The second requirement, stated explicitly in the 1994 Nuclear Posture Review (NPR) and reaffirmed in the 2002 NPR, is to maintain the capability to design a new weapon system. The test capability needs arising from these two overarching requirements are to support weapon design and development efforts at Sandia and to maintain the ability to qualify weapons to the Military Characteristics (MCs) and STS. The third requirement driving Sandia test capabilities is the need to develop and validate weapon-related models. Sandia has embarked on an aggressive modeling and simulation effort under the Advanced Simulation and Computing (ASCI) Campaign. To be successful, this campaign requires significant test support to aid the development, validation, and application of models.

The existing test capabilities are inadequate to reliably support mission requirements. Without revitalization, individual test capabilities will be lost over the next five years. Without labs and test instrumentation enhancements, the Modeling and Simulation approach to design, development, and qualification will not be achieved. Without improved test facilities, Sandia will not attract the high-quality test engineers and scientists needed to meet NNSA's stockpile stewardship obligations.

A study conducted in 2000 found that nearly 90% of TCR's test equipment and facilities were inadequate or marginal, and only 11% were adequate to meet mission requirements. Conditions have worsened since this study and multiple system failures have delayed defense program testing and increased program expenses to make temporary repairs.

05-03: Component Evaluation Facility (CEF), Pantex

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
4Q 2005	1Q 2008	4Q 2007	3Q 2010	16,000	75,000-100,000

Fiscal Year	Appropriations	Obligations	Costs
2005	2,000	2,000	500
2006	9,000	9,000	9,000
2007	5,000	5,000	5,500
2008	0	0	2,000

The proposed Component Evaluation Facility (CEF) at the Pantex Plant will consolidate and increase capability and capacity of existing technologies, and provide space for new technologies required for surveillance and requalification of weapons. The consolidation of these activities into this new facility will allow bays currently used for evaluation to be returned to weapon assembly/disassembly operations.

Capabilities at the CEF will include the ability to conduct concurrent operations on multiple stockpile weapon types on a non-interference basis, to completely disassemble and inspect any insensitive-high-explosive weapon, and sufficient facility capacity to house, test, and operate new weapon diagnostics developed in the Enhanced Surveillance activities of the Engineering Campaign.

The CEF will consist of an approximately 12-bay facility complex. The bay complex will include weapon processing bays, evaluation bays, storage areas, parts reacceptance areas, office spac,e and utilities. The facility will be designed and sited for nuclear weapon explosive packages and high energy radiography hazards.

05-04: Albuquerque Transportation and Technology Center (ATTC), AL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
4Q 2005	4Q 2007	2Q 2007	4Q 2009	17,600	170,000-200,000

Fiscal Year	Appropriations	Obligations	Costs
2005	6,000	6,000	5,000
2006	6,000	6,000	6,000
2007	5,600	5,600	6,600

The proposed Albuquerque Transportation and Technology Center (ATTC) project will enhance the Transportation and Safeguards mission in Albuquerque, New Mexico by collocating several transportation related activities at one location, providing additional space for the mission, replacing inadequate facilities, precluding the need for leasing commercial space, and housing a new mission, Continuity of Operations Preparedness (COOP). The Secure Transportation Asset mission is the single capability in the United States for the transportation of special nuclear material, components, and systems between DOE and DoD installations. Facilities in Albuquerque currently where activities are performed in support of this mission include: (1) a Federal Agent Facility (FAF) where transportation personnel are trained and dispatched; (2) a Mobile Electronic Maintenance facility (MEMF) that services the specialized communications equipment used during shipments; (3) a Vehicle Maintenance Facility (VMF) that performs maintenance and repair of tractor trailers and escort vehicles; and (4) the NNSA Kirtland Operations activity that performs research, development, engineering, and manufacturing for the specialized vehicles and communications equipment used for shipments. In addition to collocating all of these functions, the project will also include a Transportation Emergency Control Center (TECC) that will house the existing Transportation Control Center and Emergency Operations Center. The TECC will also include facilities for the COOP mission.

Many of the transportation operations are now being performed in approximately 40-year old facilities that were constructed as temporary facilities. These facilities are not sized to meet the current mission, are expensive to maintain, do not meet today's security and Environmental, Safety,& Health requirements, and cannot be economically modified to meet the current requirements. The existing TECC does not meet today's security requirements in that it is housed in a basic office building. A hardened TECC facility is required. There are no facilities available to adequately house the COOP function.

The existing transportation activities take place in six locations that are scattered over a seven-mile area. This requires a continuous movement of personnel and equipment between the sites to perform the work, and to manage the activities. Collocation of the transportation activities at one site will reduce operating costs by eliminating need for moving people and equipment, and having all activities at one location will promote operational synergies that will improve operating efficiencies. Operating costs will be reduced due to the elimination of aged facilities that are expensive to operate and maintain, and will eliminate the annual cost to lease commercial facilities.

4. Details of Cost Estimate [a]

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase [b]		
Preliminary and Final Design costs (Design Drawings and Specifications)	36,380	N/A
Design Management costs (10% of TEC)	4,280	N/A
Project Management costs (5% of TEC)	2,140	N/A
Total, Design Costs (100% of TEC)	42,800	N/A
Total, Line Item Costs (TEC, Design Only)	42,800	N/A

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[a] This cost estimate is based upon direct field inspection and historical cost estimate data, coupled with parametric cost data and completed conceptual studies and designs, when available. The cost estimate includes design phase activities only. Construction activities will be requested as individual line items upon completion of Title I design.

[b] The percentages for Design Management; Project Management; and Design Phase Contingency are estimates based on historical records and are preliminary estimates.

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. Managing and Operating (M&O) contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Project Engineering and Design	0	0	0	8,700	34,100	42,800
Total, Line Item TEC	0	0	0	8,700	34,100	42,800
Total, Facility Costs (Federal and Non-Federal)	0	0	0	8,700	34,100	42,800
Other Project Costs						
Conceptual design costs	0	0	2,101	150	45	2,296
NEPA	0	0	20	10	5	35
Other project-related costs	1,000	785	1,900	3,650	23,284	30,619
Total, Other Project Costs	1,000	785	4,021	3,810	23,334	32,950
Total Project Cost	1,000	785	4,021	8,010	61,934	75,750

05-D-401, Building 12-64 Production Bays Upgrade
Pantex Plant, Amarillo, Texas

- This project is requesting the majority of construction funding in FY 2005 to ensure the earliest and most flexible contracting for long-lead procurement and construction. This approach reduces program and project risk and enables potential project acceleration to better support the life extension project deliverables schedule.

- This project is still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (Critical Decision 2).

1. Construction Schedule History

	Fiscal Quarter					
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000)	Total Project Cost ($000)
FY 2005 Budget Request (*Preliminary Estimate*).............	1Q 2004	1Q 2006	4Q 2005	1Q 2007	30,976[a]	36,976

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2003	1,106 [b]	1,106	0
2004	1,670 [c]	1,670	2,000
2005	100	100	876
Construction			
2005	25,100	25,100	8,846
2006	3,000	3,000	12,960
2007	0	0	6,294

[a] The TEC includes the cost of preliminary and final design ($2,876,000) which was appropriated in 03-D-103, Project Engineering and Design (PED).

[b] Original appropriation was $1,139,000. This was reduced by $7,000 by a rescission and by $26,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

[c] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

3. Project Description, Justification, and Scope

The Building 12-64 Production Bays Upgrade Project at the Pantex Plant will provide a crucial asset in meeting the DOE's objective of maintaining confidence in the nuclear weapons stockpile. The Project Mission for the Building 12-64 Production Bays Upgrade is defined as completing the modifications necessary to allow Pantex the ability to conduct Nuclear Explosive (NE) operations on any weapon program, in any Bay, at any time. This project will upgrade seventeen NE bays to the Pantex and DOE complex standard for weapon operations. The need for the proposed project is workload driven. This project will provide modifications to an existing facility to increase capacity to meet the impact of changing weapon complexity, projected workload, and the life extension project activities in future planning. The project will modify the bays and the infrastructure serving the bays to bring them up to the capability of the more modern bay facilities. The project will install systems necessary to allow any weapons program to be started in any of the bays in 12-64. Some of the systems installed or modified are the heating, ventilating, and air conditioning system, the dehumidification system, the building electrical system, the hoists and hoist support system, installation of a deluge system, and the installation of a task exhaust system.

These modifications will allow the facility to resume nuclear explosive work. This will add another 17 bays to alleviate the projected bay resource short fall to support the planned workload for the life extension project expected to start in FY 2007. The construction activities are planned to occur on a non-interference basis with the on-going production activities in 12-64. At present, the pit repackaging efforts occur in the majority of the bays in 12-64. These efforts will be complete in time for construction to begin on schedule.

The project is interrelated with the Building 12-44 Production Cells Upgrade Project. The weapons must go through operations in the bays before transportation to the Cells. This project will prepare the weapons for the cell operations. Both projects provide additional capacity to meet the life extension project schedules.

Project Milestones

FY 2004:	Establish Performance Baseline (CD-2)	3Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase (9.3% of TEC) [a]	2,876	N/A
Construction Phase		
Improvements to Land	33	N/A
Buildings	19,437	N/A
Removal Cost less salvage	1,876	N/A
Construction Management (6.7% of TEC)	2,071	N/A
Project Management (.8% of TEC)	239	N/A
Total Construction Costs (76.4% of TEC)	23,656	N/A
Contingencies		
Construction Phase (14.3% of TEC)	4,444	N/A
Total, Line Item Costs (TEC) [b]	30,976	N/A

5. Method of Performance

The design services (Title I, II, III) will be accomplished by an outside A-E firm and will be administered by the Managing and Operating (M&O) Contractor (BWXT Pantex, LLC) who will perform equipment design and procurement. The construction services of this project will be performed by an outside construction contractor operating under a contract to be awarded on the basis of competitive bids. This contract will be administered by the M&O Contractor (BWXT Pantex, LLC). Construction Management Services will be performed by the M&O Contractor (BWXT Pantex, LLC). Best value practices will be used for design and construction services.

[a] Design funding was appropriated in 03-D-103, PED.

[b] This is a preliminary estimate. The performance baseline will be established following completion of preliminary design and CD-2.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	2,000	876	0	2,876
Construction	0	0	0	8,846	19,254	28,100
Total, Line item TEC	0	0	2,000	9,722	19,254	30,976
Total Facility Costs (Federal and Non-Federal)	0	0	2,000	9,722	19,254	30,976
Other Project Costs						
Conceptual design cost	0	851	58	0	0	909
NEPA Documentation costs	0	30	0	0	0	30
Other project-related costs	0	198	158	269	4,436	5,061
Total Other Project Costs	0	1,079	216	269	4,436	6,000
Total Project Cost (TPC)	0	1,079	2,216	9,991	23,690	36,976

7. Related Annual Funding Requirements

(FY 2007 dollars in thousands)

	Current Estimate	Previous Estimate
Related annual costs (estimated life of project – 30 years)		
Facility operating costs	1,100	N/A
Facility maintenance and repair costs	464	N/A
Programmatic operating expenses directly related to the facility	500	N/A
Capital equipment not related to construction but related to the programmatic effort in the facility	400	N/A
Utility costs	302	N/A
Total related annual funding (operating from FY 2007 through FY 2036)	2,766	N/A

05-D-402, Beryllium Capability (BeC) Project
Y-12 National Security Complex, Oak Ridge, Tennessee

- In FY 2002/2003, the Beryllium Capability Project (formerly titled Beryllium Manufacturing Facility) underwent extensive program evaluation. These reviews resulted in a modified approach that delivers a better balance of capabilities required to improve environment, safety and health measures and support current and future projected needs of the weapons program. The project has been revised to support the start of preliminary design, including:
  - The Total Estimated Cost (TEC) has been reduced from a range of $150-$200 million to $35-45 million, and the Total Project Cost (TPC) has been reduced accordingly.
  - The project title has been changed from Beryllium Manufacturing Facility to Beryllium Capability Project to more accurately reflect the revised mission and program requirements.
  - The Architect-Engineering (A-E) Work Initiated date has changed from 2Q 2003 to 3Q 2004 to address additional program evaluation and project alternatives development. Overall, the construction complete date has been accelerated from 3Q 2009 to 2Q 2008.

  These revisions incorporate modifications to project scope driven by changes in program requirements and priorities. The changes are primarily reductions in scope consistent with the program decision to provide the necessary equipment and facilities to maintain existing beryllium components versus manufacturing new components.
- The FY 2005 construction request is required in order to support long-lead procurement required during design and prior to the start of construction.
- Since the project is still in the Planning Phase, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (Critical Decision 2--CD-2).

1. Construction Schedule History

	Fiscal Quarter					
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000)	Total Project Cost ($000)
FY 2005 Budget Request (*Preliminary Estimate*)………..	3Q 2004	3Q 2005	1Q 2006	2Q 2008	40,000	50,000

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations [a]	Costs[a]
Design [b]			
2002	0 [c]	0	0
2003	0 [d]	0	0
2004	7,700 [e]	7,000	1,800
2005	0	0	5,200
Construction			
2005	3,627	4,327	1,000
2006	15,000	15,000	16,000
2007	12,000	12,000	13,000
2008	1,673	1,673	3,000

3. Project Description, Justification, and Scope

This project provides equipment and facilities for the Beryllium Capability (BeC) Project at the Y-12 National Security Complex. This project will provide a new long-term capability to maintain existing Be components versus manufacturing new components.

The BeC Project will replace existing beryllium operational capabilities that are obsolete and inadequate to meet

[a] Obligations and costs assume that $700,000 will be reprogrammed in FY 2005 from PED (02-D-103) to this line item to support construction activities.

[b] Design funding was appropriated in 02-D-103, PED.

[c] Original FY 2002 appropriation of $7,700,000 was reduced by $800,000 as part of a reprogramming to 01-D-103 for the Purification Facility design. The appropriated amount was further reduced by $1,695,000 as a result of a rescission pursuant to the FY 2002 Supplemental Appropriations Act, P.L. 107-206. Finally, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $5,205,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000.

[d] Original appropriation was $8,665,000. This was reduced by $56,000 by a rescission and by $196,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $876,000 by the FY 2003 reduction/reallocation reprogramming. In addition, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $6,669,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000. The remaining $868,000 is proposed for reprogramming for the Departmental commitment for EEOICPA.

[e] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

program requirements and environmental, safety, and health (ES&H) requirements. The scope includes capability for cleaning, handling, and inspecting BeO parts as well as sample preparation. An area for a future feature machine operation will also be provided. Much of the existing equipment has deteriorated and is at the end of its useful life. The systems are inefficient and unreliable due to their age and the state of disrepair, and maintenance is difficult and expensive due to the age, contamination levels of the equipment, and difficulty in acquiring spare parts. New equipment will provide an increased level of worker and personnel protection. This project will also have the additional benefit of vacating old facilities that are seriously degraded which will allow for further footprint reduction and reduction of maintenance backlog.

Project Milestones:

FY 2005: Establish Performance Baseline (CD-2) 3Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase (17.5% of TEC) [a]	7,000	N/A
Construction Phase		
Buildings	8,500	N/A
Special Equipment	9,500	N/A
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	3,200	N/A
Construction Management (2.8% of TEC)	1,100	N/A
Project Management (3.8% of TEC)	1,500	N/A
Total, Construction Costs (59.5% of TEC)	23,800	N/A
Contingencies		
Construction Phase (23% of TEC)	9,200	N/A
Total, Line Item Costs (TEC) [b]	40,000	N/A

5. Method of Performance

Overall project direction and responsibility for this project resides with the NNSA. NNSA has assigned day-to-day management of project activities to the Y-12 Security Complex Management and Operating (M&O) contractor, BWXT Y-12, including design, procurement, construction, and commissioning.

The M&O contractor will perform preliminary design. To the extent practical, final design and major procurement will be performed by an engineering/procurement (E/P) subcontractor awarded on the basis of the best value to the government. Construction will be performed to the extent practical using subcontracts that are awarded based on fixed-price competitive bidding.

[a] Design funding was appropriated in 02-D-103, PED.

[b] This is a preliminary estimate. The Performance Baseline will be established following completion of preliminary design and approval of CD-2.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Design	0	0	1,800	5,200	0	7,000
Construction	0	0	0	1,000	32,000	33,000
Total, Line item TEC	0	0	1,800	6,200	32,000	40,000
Total, Facility Costs (Federal and Non-Federal)	0	0	1,800	6,200	32,000	40,000
Other Project Costs						
Conceptual design cost [a]	0	0	1,500	0	0	1,500
Other project-related costs [b]	0	0	1,500	1,500	5,500	8,500
Total, Other Project Costs	0	0	3,000	1,500	5,500	10,000
Total, Project Cost (TPC)	0	0	4,800	7,700	37,500	50,000

7. Related Annual Funding Requirements

(FY 2008 dollars in thousands)

Related annual costs	Current Estimate	Previous Estimate
Annual facility operating costs [c]	TBD	N/A
Annual utility costs	TBD	N/A
Total related annual funding (operating from FY 2008 through FY 2028)	TBD	N/A

[a] The Conceptual design costs include costs for completion of the Critical Decision 1 package and related documentation (e.g., project execution plan, conceptual design report, acquisition strategy, National Environmental Protection Act evaluation, ES&H plan, and Quality Assurance Plan).

[b] Other project related costs include plant support to the project and commissioning/startup activities (e.g., development of plans and procedures, commissioning, and startup).

[c] Annual facility operating costs to be determined during design.

04-D-103, National Nuclear Security Administration Project Engineering and Design (PED) Various Locations

Significant Changes

- The FY 2004 Appropriations Act added funding for design of the replacement of the NTS Fire Station No. 1, which increased the TEC by $1,564,000.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2004 Budget Request *(A-E and technical design only)*…………………	1Q 2004	3Q 2006	N/A	N/A	3,500
FY 2005 Budget Request *(A-E and technical design only)*…………………	2Q 2004	4Q 2006	N/A	N/A	5,064

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2004	3,564[b]	3,564	1,200
2005	1,500	1,500	3,164
2006	0	0	700

3. Project Descriptions, Justification, and Scope

This project provides for Architect-Engineering (A-E) services for several National Nuclear Security Administration (NNSA) construction projects, allowing designated projects to proceed from conceptual design into preliminary design and final design. The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support

[a] The Total Estimated Cost (TEC) is for design only for the subprojects currently included in this data sheet.

[b] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

FY 2004 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of preliminary and final design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the TEC (including physical construction) of each subproject. The final TEC and the Total Project Cost (TPC) for each project described below will be validated and the Performance Baseline will be established at Critical Decision 2 (CD-2), following completion of preliminary design.

FY 2004 Proposed Design Projects

04-01: NTS Replace Fire Station No. 2, Nevada Test Site

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2004	1Q 2005	2Q 2006	4Q 2007	800	9,000-10,000

Fiscal Year	Appropriations	Obligations	Costs
2004	800	800	400
2005	0	0	400

This design project provides for the A-E services to develop and complete preliminary and final design for the proposed NTS Replace Fire Station No. 2, Nevada Test Site. This subproject will design the replacement for an existing undersized fire station facility built in 1966. The new Fire Station will be approximately 12,460 square feet, as compared to the existing 4,255 square foot facility, and will comply with National Fire Protection Association (NFPA) 1500 and provide the correct space to accommodate emergency response units. It will also provide administrative and dormitory space, as well as restrooms, a kitchen, training classrooms, storage, and support areas (e.g., medical treatment room). The facility will include all heating, ventilation, and air-conditioning (HVAC), fire protection, electrical, communications, and local area network (LAN) systems and a fiber optics communications network throughout the facility to meet present and projected requirements. The project will include all administrative equipment, furniture, and associated equipment necessary to operate the facility.

04-02: High Explosives (HE) Pressing Facility, Pantex Plant

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
4Q 2004	4Q 2006	4Q 2006	2Q 2008	2,700	30,000-36,000

Fiscal Year	Appropriations	Obligations	Costs
2004	1,200	1,200	500
2005	1,500	1,500	1,500
2006	0	0	700

The proposed HE Pressing Facility will support requirements of the Stockpile Stewardship and Management Program. The project will provide a new facility replacing the aging presses and Buildings 12-17, 12-21A, and 12-63, that house the high explosive main charge pressing activities at the Pantex Plant. It will provide Pantex the facilities to meet the impact of changing weapon complexity, projected workload, and the refurbishment activities in future planning, including the W76, W78, and W88 LEPs.

The proposed HE Pressing Facility consists of approximately 43,000 square feet and includes the main pressing facility, a magazine storage area, and a ramp. The facility will consist of:

- Powder inspection/weighing bay
- Oven bays to heat the explosives prior to pressing
- HE press bays for isostatic and mechanical presses
- NDE bay to evaluate pressed HE parts prior to machining
- Machining bay for rough cut machining
- Staging bays for staging explosives powder, pressed pieces, and rough cut pressed pieces.

This project will also have the additional benefit of vacating old facilities allowing footprint reduction and maintenance backlog.

04-03: NTS Replace Fire Station No. 1, Nevada Test Site

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2004	1Q 2005	2Q 2006	4Q 2007	1,564	9,000-10,000

Fiscal Year	Appropriations	Obligations	Costs
2004	1,564	1,564	300
2005	0	0	1,264

This design project provides for the A-E services to develop and complete preliminary and final design for the proposed NTS Replace Fire Station No. 1, Nevada Test Site. Approximately 1000 employees and 1300 square miles of the Nevada Test Site are being served by Fire Stations No. 1 and No. 2, located 25 miles apart. Constructed to meet the 1960's codes, the buildings do not meet current code requirements. The design for replacing Fire Station No. 2 is also included in this data sheet (subproject 01), and was requested in the FY 2004 Congressional budget because it was considered of higher priority due to the physical condition of the facility. The FY 2004 Appropriation Act added funding for the design of this fire station as well.

Major areas of deficiencies affect every area of occupational safety and health, including; separation of public and living areas from the vehicular and maintenance areas; isolation of blood borne pathogens, maintenance of clothing, breathing, and other equipment in proper facilities, and the general well being of employees who could be on duty up to 56 hours at a time.

The function of the station include those of a standard municipal fire and emergency management facilities (structural and vehicular fire fighting and rescue) and in addition, are equipped for airfield and wild-land fires; respond to HAZMAT conditions; provide training for fire fighting personnel and those who respond to HAZMAT conditions; and, respond to search and rescue operations. Fire Station No. 1 also has all of the function of the main administrative station in a small city, plus the responsibilities and facilities requirements associated with 911 call centers.

Preliminary design for the project will address the potential of a design-build acquisition strategy to shorten the construction schedule and potentially lower the cost.

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase [a]		
Preliminary and Final Design costs (Design Drawings and Specifications)…………….	4,314	2,975
Design Management costs (10% of TEC)……………………………………………….	500	350
Project Management costs (5% of TEC)…………………………………………………	250	175
Total, Design Costs (100% of TEC)………………………………………………………..	5,064	3,500
Total, Line Item Costs (TEC, Design Only)………………………………………………….	5,064	3,500

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. Managing and Operating (M&O) contractor staff may be utilized in areas involving security, production, proliferation, and other concerns.

[a] The percentage for Design Management, Project Management, and Design Phase Contingency are estimates based on historical records and are preliminary estimates.

6. Schedule of Project Funding

	(dollars in thousands)					
	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Project Engineering and Design………………	0	0	1,200	3,164	700	5,064
Total, Line Item TEC………………..………..	0	0	1,200	3,164	700	5,064
Total, Facility Costs (Federal and Non-Federal)	0	0	1,200	3,164	700	5,064
Other Project Costs						
Conceptual design costs……………………..	0	605	350	50	0	1,005
NEPA………………………………………...	0	5	5	5	0	15
Other project-related costs………………….	0	0	0	375	1,410	1,785
Total, Other Project Costs……………………….	0	610	355	430	1,410	2,805
Total, Project Costs………………………………	0	610	1,555	3,594	2,110	7,869

04-D-125, Chemistry and Metallurgy Research Facility Replacement Project, Los Alamos National Laboratory
Los Alamos, New Mexico

Significant Changes

- The construction line item funding profile has been modified to reflect the FY 2004 Appropriation that reduced funding by $10,500,000, as well as a reduction of $51,000,000 to what had been planned for FY 2005. The large reduction to the FY 2005 request was necessary to address other high priority NNSA requirements (e.g., implementation of the new Design Basis Threat). The reductions in FY 2004-05 impact the out-year funding profile and schedule for this project, and as a result the project will be re-evaluated and revised during FY 2004. The changes will be reflected in the FY 2006 request.

  Further, as part of the re-evaluation of this project, the National Nuclear Security Administration (NNSA) will conduct an analysis of the Total Estimated Cost/Total Project Cost (TEC/TPC), that are being developed as the planning phase continues. The analysis is required in order to validate early estimates that indicate that the TEC and TPC could be at the higher end of the pre-conceptual baseline range, which is higher than the estimate in Section 1. Updated estimates will be provided in the FY 2006 request.

  Finally, preliminary schedule data for the project has been revised to be consistent with continued project development; however, the overall project schedule will be adjusted, as necessary, as part of the NNSA re-evaluation of the project and any changes will be reflected in the FY 2006 request.

- The cost of project engineering and design (PE&D) for preliminary design for this project has increased by $10,000,000. A full (preliminary and final) Design-Build (D-B) approach for most project activities was the basis for the initial PE&D estimate. The reduction in line item funding in FY 2004-05 has required an alternative approach in order to minimize overall schedule delays. The revised approach will utilize separate preliminary designs, where possible, for all project activities and will rely on Los Alamos National Laboratory (LANL) to conduct more preliminary design work, rather than procuring these services under full D-B contracts. The PE&D funding request in FY 2005 will support continuation of preliminary design and engineering work for all project elements.

- FY 2004 line item construction funding will be used to implement the D-B acquisition of the Radiological Laboratory/Utility/Office Building (RLUOB) component of the Chemistry and Metallurgy Research Facility Replacement (CMRR). The FY 2005 request for construction funds will support continuation of the RLUOB and initiation of the D-B activities for Special Facility Equipment (SFE) - Gloveboxes. Initiation of the Security Category I, Hazard Category 2 Nuclear Facility is planned for FY 2006.

1. Construction Schedule History [a]

	Fiscal Quarter				Total Estimated Cost [b] ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request (*Preliminary Estimate*)…………………	1Q 2004	3Q 2006	2Q 2004	1Q 2011	500,000	600,000
FY 2005 Budget Request *(Preliminary Estimate)*………………..	3Q 2004	3Q 2007	3Q 2005	3Q 2012	500,000	600,000

[a] The TEC and TPC for this project are being developed as the planning phase continues. Early indications are that the TEC and TPC are at the higher end of the pre-conceptual baseline range, which is higher than the estimate in Section 1. Updated estimates will be provided in the FY 2006 request. In addition, physical construction start/complete dates will be impacted by FY 2004 and FY 2005 funding reductions. The NNSA is evaluating the impacts of the funding reductions and will provide a new profile and schedule in the FY 2006 request.

[b] The TEC includes the cost of preliminary design ($24,500,000) appropriated in 03-D-103, Project Engineering and Design (PED).

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2003	0 [b]	0	0
2004	4,500 [c]	10,825	10,000
2005	13,675	13,675	14,500
Construction			
2004	10,000[c]	10,000	7,500
2005	24,000	24,000	24,500
2006	110,000	110,000	70,000
2007	100,000	100,000	95,000
2008	100,000	100,000	95,000
2009	80,000	80,000	95,000
2010	51,500	51,500	86,700
2011	0	0	1,800

3. Project Description, Justification, and Scope

Project Description

The Chemistry and Metallurgy Research Facility Replacement (CMRR) Project seeks to relocate and consolidate mission critical analytical chemistry, material characterization, and actinide research and development capabilities, to ensure continuous national security mission support beyond 2010 at the LANL.

Project Justification

In January 1999, the NNSA approved a strategy for managing risks at the Chemistry and Metallurgy Research (CMR) Facility. This strategy recognized that the 50-year-old CMR Facility could not continue its mission support at an acceptable level of risk to public and worker health and safety without operational restrictions. In addition, the strategy committed NNSA and LANL to manage the existing CMR Facility to planned end of life on or around 2010, and to develop long-term facility and site plans to replace and relocate CMR capabilities elsewhere at LANL, as necessary to maintain support of national security missions. CMR capabilities are currently substantially restricted and unplanned facility outages have resulted in the operational loss of two of seven wings at the CMR Facility. These

[a] Design funding was appropriated in 03-D-103, PED.

[b] Original appropriation was $10,000,000. This was reduced by $64,000 by a rescission and by $227,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased by $3,384,000 for a reprogramming. Finally, the FY 2004 Appropriation Act use of PY balances reduction eliminated the remaining $6,325,000, but the funding is required by the project and NNSA plans to restore it with a reprogramming action during FY 2004. The obligations and costs assume this reprogramming action.

[c] The FY 2004 appropriated amounts have not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

operational restrictions preclude the full implementation of the level of operations DOE/NNSA requires as documented through the Record of Decision for the 1999 LANL Site-Wide Environmental Impact Statement, and the 1996 Stockpile Stewardship and Management Programmatic Environmental Impact Statement. The CMRR project will relocate mission-critical CMR capabilities at LANL to sustain national security missions at LANL while reducing risks to the public and workers.

Project Scope

As currently envisioned, the CMRR project consists of three primary elements. These elements define the basic scope and drive the acquisition strategy.

- Radiological Laboratory/Utility/Office Building (RLUOB): Construction of a facility(s) to house light laboratory of approximately 20,000 net square feet capable of handling radiological (<8.4g Pu^{239} equivalent) quantities of Special Nuclear Materials (SNM), a utility building sized to provide utility services (including heating and chilled water, potable hot/cold water, compressed air, and process gasses) for all CMRR facility elements, and office space for CMRR workers located outside of perimeter security protection systems. The RLUOB is the initial element of the CMRR and will be completed under a Design-Build (D-B) approach.

- CMRR Nuclear Laboratory(s): Construction of a facility(s) of approximately 45,000[a] net square feet to house Hazard Category II (approximately 22,000 net sq. ft.) and Hazard Category III (approximately 23,000 net sq. ft) nuclear laboratory space for Actinide Chemistry/Material Characterization (AC/MC) operations, SNM Storage, large vessel handling capability and associated mission contingency space located behind perimeter security protective systems. The nuclear laboratories will follow the RLUOB and will be completed through a modified D-B acquisition procurement.

- Special Facilities Equipment (SFE) - Gloveboxes: Includes design/procurement for Special Facilities Equipment (gloveboxes and long-lead AC/MC equipment) for CMRR nuclear laboratory(s). The SFE – Gloveboxes element will be conducted in parallel with the nuclear laboratories.

Project Milestones

FY 2004:	Critical Decision 2/3, Performance Baseline for RLUOB (Design-Build)	4Q
FY 2005:	Physical Construction Start, RLUOB	3Q
	Critical Decision 2/3, Performance Baseline for Nuclear Facility(s)	3Q

[a] All space estimates cited were identified through joint NNSA/LANL Integrated Nuclear Planning Activities and are preliminary pending further project development.

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase (4.9% of TEC)[a]	24,500	14,500
Construction Phase		
Buildings	358,500	368,500
Construction Management (1.4% of TEC)	7,000	7,000
Project Management (5.0% of TEC)	25,000	25,000
Total, Construction Costs (78.1% of TEC)	390,500	400,500
Contingencies		
Construction Phase (17.0% of TEC)	85,000	85,000
Total, Line Item Costs (TEC)[b]	500,000	500,000

5. Method of Performance

The CMRR Acquisition Strategy currently anticipates use of a design/build procurement contract awarded after the completion of preliminary design activities for the Radiological Laboratory/Utility/Office Building and SFE-Gloveboxes project elements. Additionally, potential use of a design/build procurement contract for the CMRR Nuclear Facility(s) element awarded during final design activities is being evaluated as part of Acquisition Strategy development. The CMRR Acquisition Strategy will be approved in conjunction with Critical Decision 1, planned for March 2004.

[a] Design funding was appropriated in 03-D-103, PED.

[b] This is a preliminary estimate. The performance baseline will be established following completion of preliminary design and approval of Critical Decision 2 (CD-2). On December 12, 2003, the NNSA met to discuss options of conceptual design scope to be selected at CD-1 and to be further developed during preliminary design. The funding to support the preliminary scope of work will require revision to this CDPS for FY 2006 and beyond.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	10,000	14,500	0	24,500
Construction	0	0	7,500	24,500	443,500	475,500
Total, Line Item TEC	0	0	17,500	39,000	443,500	500,000
Other Project Costs						
Conceptual Design Cost	2,200	9,525	5,300	0	0	16,650
NEPA	200	1,025	100	0	0	1,700
Operational Readiness/Transition	0	0	0	0	45,700	45,700
Other Project-Related Costs	5,250	0	1,000	5,000	24,700	35,950
Total Other Project Costs [a]	7,650	10,550	6,400	5,000	70,400	100,000
Total Project Cost (TPC)	7,650	10,550	23,900	51,700	506,200	600,000

7. Related Annual Funding Requirements

(FY 2004 dollars in thousands)

	Current Estimate	Previous Estimate
Related annual costs (estimated life of project – 30 years)[b]	TBD	TBD
Annual facility operating costs	TBD	TBD
Facility maintenance and repair costs	TBD	TBD
Programmatic operating expenses directly related to the facility	TBD	TBD
Programmatic capital equipment not related to construction	TBD	TBD
Utility costs	TBD	TBD
Total related annual funding (operating FY2004 through FY2033)	TBD	TBD

[a] Prior year OPC costs were updated to reflect actual costing per element noted above.

[b] Facility operating costs will be developed during preliminary design.

04-D-126, Building 12-44 Production Cells Upgrade
Pantex Plant, Amarillo, Texas

Significant Changes

- This project is still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (Critical Decision 2).
- The preliminary baseline was established in June 2003, which resulted in the following revisions:
  - Total Project Cost (TPC) was reduced by $2,342,000 from $16,840,000 to $14,498,000.
  - Total Estimated Cost (TEC) was increased by $2,568,000 from $11,380,000 to $13,948,000. This included a reduction in design of $1,550,000 and an increase in construction of $4,118,000.
  - Other Project Cost (OPC) was reduced by $4,910,000 from $5,460,000 to $550,000.
  - Design start was delayed from 2Q 2003 to 3Q 2003.

  These revisions incorporate adjustments to project scope, efficiencies, and contingencies to address identified project risks (e.g., increased security conditions). Previously appropriated Project Engineering and Design (PED) funding that is no longer required to complete design is planned to be reprogrammed to construction to support establishment of the performance baseline in FY 2004. Scope, cost, and schedule data have been revised consistent with the preliminary baseline and the projected reprogramming.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)[a]	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request *(Preliminary Estimate)*	2Q 2003	4Q 2004	1Q 2005	1Q 2007	11,380	16,840
FY 2005 Budget Request *(Preliminary Estimate)*	3Q 2003	4Q 2004	1Q 2005	1Q 2007	13,948	14,498

[a] The TEC includes the cost of preliminary and final design ($1,050,000), which was appropriated in 02-D-103, Project Engineering and Design.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations [a]	Costs [a]
Design[b]			
2002	1,500	0	0
2003	1,068[c]	493	67
2004	0	557	983
Construction			
2004	8,780[d]	10,298	0
2005	2,600	2,600	5,647
2006	0	0	5,645
2007	0	0	1,606

3. Project Description, Justification, and Scope

Project Description

The Building 12-44 Production Cells Upgrade will provide a crucial asset in meeting the Department of Energy/National Nuclear Security Administration (DOE/NNSA) objective of maintaining confidence in the nuclear weapons stockpile. This project will provide modifications to an existing facility to increase capacity to meet the impact of changing weapon complexity, projected workload, and life extension project activities. The W76 Life Extension Program (LEP) is the first user to benefit from this additional capacity with other programs to follow.

This project will lessen the cell shortfall by modifying five cells in Building 12-44. The project scope consists of upgrading these cells to the same production capability/capacity level as other cells at Pantex. The modifications to each of the five cells include upgrades to the heating, ventilation, and air conditioning (HVAC), material handling, fire protection, lighting, lightning protection, electrical power, containment structure, finish, and other building systems.

In addition, other scope elements are being evaluated within the design phase for potential inclusion as opportunity investments that will reduce future downtime and operational costs and are cost effective to perform while the facilities are down for construction. A decision on inclusion of these items in the

[a] Consistent with the preliminary baseline, the total estimated PED funding requirement to complete design is $I,050,000. It is planned that $1,518,000 of the PED funding will be reprogrammed to the construction line item to support establishment of the performance baseline in FY 2004. The obligations and costs assume the reprogramming.

[b] Design funding was appropriated in 02-D-103, PED.

[c] Original appropriation was $1,100,000. This was reduced by $7,000 by a rescission and by $25,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

construction scope will be made after a complete evaluation of project contingency needs as part of the establishment of the performance baseline.

Project Milestones

FY 2004: Establish Performance Baseline (Critical Decision 2) 3Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Total, Design Phase (7.5 % of TEC)[a]	1,050	2,600
Construction Phase		
Improvements to Land	0	40
Buildings	7,034	5,510
Construction Management (7.2 % of TEC)	1,017	580
Project Management (2.6 % of TEC)	364	250
Total, Construction Costs (60.3 % of TEC)	8,415	6,380
Contingencies		
Construction Phase (32.1 % of TEC)	4,483	2,400
Total, Line Item Costs (TEC)[b]	13,948	11,380

5. Method of Performance

The design services (Title I, II, III) will be accomplished by an outside Architect-Engineering (A-E) firm and will be administered by the Managing and Operating (M&O) Contractor, BWXT Pantex, LLC. The construction services of this project will be performed by an outside construction contractor operating under a contract to be awarded on the basis of competitive bids. This contract will be administered by the M&O Contractor (BWXT Pantex, LLC). Construction Management Services will be performed by the M&O Contractor (BWXT Pantex, LLC). Best value practices have been used for design and will be considered for construction services.

[a] Design funding was appropriated in 02-D-103, PED.

[b] This is a preliminary baseline estimate. The performance baseline will be established following completion of preliminary design and approval of Critical Decision 2. Estimate reflects reprogramming of $1,518,000 of PED funds, that are no longer required for design, to construction consistent with the preliminary baseline.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	67	983	0	0	1,050
Construction	0	0	0	5,647	7,251	12,898
Total, Line Item TEC	0	67	983	5,647	7,251	13,948
Total Facility Costs (Federal and Non-Federal)	0	67	983	5,647	7,251	13,948
Other Project Costs						
Conceptual design cost	113	209	0	0	0	322
NEPA	2	0	0	0	0	2
Other project-related costs	0	20	27	0	179	226
Total Other Project Costs	115	229	27	0	179	550
Total Project Cost (TPC)	115	296	1,010	5,647	7,430	14,498

7. Related Annual Funding Requirements

(FY 2005 dollars in thousands)

	Current Estimate	Previous Estimate
Related annual costs (estimated life of project--30 years)		
Annual facility operating costs	400	400
Facility maintenance and repair costs	320	320
Programmatic operating expenses directly related to the facility	1,500	1,500
Programmatic capital equipment not related to construction	350	350
Utility costs	325	325
Total related annual funding (operating from FY 2005 through FY 2033)	2,895	2,895

04-D-127, Capability for Advanced Loading Missions
Savannah River Site, Aiken, South Carolina

Significant Changes

- In FY 2002/2003, the Capability for Advanced Loading Missions (CALM) (formerly titled Cleaning and Loading Modifications) project underwent extensive program evaluation. Reviews resulted in a modified approach that delivers a better balance between the capabilities and capacities required in the near-term for the life extension projects and the future projected needs of the weapons program. The additional design alternatives resulted in a total conceptual cost approaching the $3,000,000 congressional limit. This limit may be exceeded if further conceptual design activity is required to support Critical Decision 1.

- The project has been delayed and will now begin design in the first quarter of FY 2005. The funding appropriated in FY 2004 supports long-lead procurements of components that will be initiated in FY 2005 and FY 2006. The early procurement will occur prior to establishing the Performance Baseline and will be approved by the Acquisition Executive at Critical Decision 3A (CD-3A). These procurements support long-lead engineered equipment which must be initiated in FY 2005 to support an FY 2006 construction start.

- The conceptual project baseline has been revised as follows:

  - The Total Estimated Cost (TEC) increased slightly by $220,000 and the Total Project Cost (TPC) decreased by $1,020,000.
  - The project title has been changed from Cleaning and Loading Modifications to Capability for Advanced Loading Missions to more accurately reflect the revised mission and program requirements.
  - The Architect-Engineering (A-E) Work Initiated date has changed from the third quarter of FY 2003 to the first quarter of FY 2005 to address the additional program evaluation and project alternatives development, and the delay in the start of the project. The addition of advanced capabilities and the combined cleaning and loading system simplifies construction but increased the overall engineering detail required thereby increasing the A-E cost.

  These revisions incorporate modifications to project scope driven by changes in program requirements and priorities.

- Funding previously appropriated for design in Project Engineering and Design (PED) line item 02-D-103 for this project in FY 2002 and FY 2003 was reprogrammed for other Department of Energy requirements.

- The project is still in the planning phase. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (CD-2).

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost [a] ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request *(Preliminary Estimate)………*	3Q 2003	1Q 2005	1Q 2005	3Q 2007	37,000	56,000
FY 2005 Budget Request *(Preliminary Estimate)………*	1Q 2005	4Q 2006	4Q 2006	1Q 2009	37,000	54,980

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [b]			
2004	1,750[c]	0	0
2005	5,250	7,000	5,083
2006	3,150	3,150	5,067
Construction			
2004	2,750[c]	0	0
2005	0	2,750	1,923
2006	4,001	4,001	4,828
2007	11,045	11,045	11,000
2008	8,875	8,875	8,800
2009	399	399	519

[a] The TEC includes the cost of preliminary and final design ($10,150,000), appropriated in 02-D-103, PED.

[b] Design funding was appropriated in 02-D-103, PED. Funding appropriated in FY 2002 ($1,000,000) and FY 2003 ($3,399,000 – original appropriation of $3,500.000 which was reduced by $22,000 by rescission and by $79,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI) was eliminated by a reprogramming for OVEC enacted in the FY 2004 Appropriations Act ($3,500,000), and by a proposed reprogramming for the Departmental commitment for EEOICPA ($899,000).

[c] The FY 2004 appropriated amounts have not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

3. Project Description, Justification, and Scope

Project Description

The Capability for Advanced Loading Missions (CALM) project supports the mission of the National Nuclear Security Administration (NNSA) to maintain the nuclear weapons stockpile, without underground nuclear testing, to meet national security requirements. This mission is encompassed in the DOE Stockpile Stewardship Program (SSP), that ensures the operational readiness of the nuclear weapons through the Directed Stockpile Work (DSW) activities. The DSW program conducts surveillance, maintenance, design, and manufacturing activities required to maintain the nuclear weapons stockpile and to certify the stockpile remains safe, secure, and reliable. Investment in advanced capabilities for the future is essential to ensure the long-term capabilities to accurately assess weapon status and reliability.

The objective of the CALM Project is to provide Savannah River Site (SRS) tritium facilities with the capability and capacity to process the converted W80, W76, and W87 weapons systems tritium reservoirs. This project will modify an existing reservoir loading line to enable cleaning and loading of these new reservoirs as well as add unloading capabilities. The combination of cleaning and loading is a modified approach to the Critical Decision 0 project scope definition and has resulted in a reduction in TPC. OPC requirements have been reduced. The objective is in support of the nuclear weapons life extension projects and will be accomplished while maintaining the limited life component exchange requirements for tritium reservoir loading and unloading. These capability and capacity requirements are given in the NNSA Production and Planning Directive (P&PD) 2001-0, dated February 2001, P&PD 2002-0, and P&PD 2003-0.

Project Milestones:

FY 2005	Initiate Long-Lead Procurement (CD-3A)	4Q
FY 2006	Establish Performance Baseline (CD-2)	1Q
FY 2006	Start Construction (CD-3B)	4Q
FY 2009	Approval Start of Operations (CD-4)	4Q

4. Details of Cost Estimate [a] [b]

	(dollars in thousands) Current Estimate	Previous Estimate
Total, Design Costs (27.3% of TEC)	10,150	6,250
Construction Phase		
Buildings	8,166	14,000
Standard Equipment	6,195	2,750
Construction Management (7.0% of TEC)	2,589	4,500
Project Management (10.9% of TEC)	4,068	2,500
Total, Construction Costs (56.5% of TEC)	21,018	23,750
Contingencies		
Construction Phase (16.3x% of TEC)	6,052	7,000
Total, Line Item Costs (TEC)	37,220	37,000

5. Method of Performance

Design, construction and procurement is planned to be accomplished by the Management and Operating (M&O) contractor (Westinghouse Savannah River Corporation--WSRC). Specific scopes of work within this project are planned to be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	0	5,083	5,067	10,150
Construction	0	0	0	1,923	25,147	27,070
Total, Line Item TEC	0	0	0	7,006	30,214	37,220
Other Project Costs						
Conceptual design cost	1,118	1,381	261	0	0	2,760
Other project-related costs	0	0	0	1,019	13,981	15,000
Total Other Project Costs	1,118	1,381	261	1,019	13,981	17,760
Total Project Cost (TPC)	1,118	1,381	261	8,025	44,195	54,980

[a] Design funding was appropriated in 02-D-103, PED.

[b] This is a preliminary estimate. The Performance Baseline will be established following completion of preliminary design and approval of CD-2.

7. Related Annual Funding Requirements

	(FY 2003 dollars in thousands)	
	Current Estimate	Previous Estimate
Annual facility operating costs	1,000	10,000
Total related annual funding (operating from FY 2009 through FY 2039)	1,000	10,000

04-D-128, TA-18 Mission Relocation
Los Alamos National Laboratory
Nevada Test Site, Nevada

Significant Changes

- Due to the dynamic nature of the missions performed at Technical Area (TA)-18, conceptual design activities are now expected to be completed in late FY 2004 as preliminary estimates warranted a re-examination of program and project requirements to contain total project costs. Preliminary reviews of the conceptual design have not completely contained project costs and schedule within current funding profiles outlined in this data sheet. As such, the National Nuclear Security Administration (NNSA) senior management will conduct a detailed review of the conceptual design during the second quarter of FY 2004. The review will focus on three key areas: validating the proposed baseline range, assessing the appropriateness of placing some activities within the project versus program, and selecting a project management structure. The results of this review and the approved path forward for this project will be documented in a revised project data sheet that will be provided to Congress.

- This data sheet incorporates prior year Other Project Costs (OPCs) for conceptual design activities and environmental studies.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request *(Preliminary Estimate)*……...	1Q 2004	4Q 2005	4Q 2004	2Q 2008	111,000	130,000
FY 2005 Budget Request *(Preliminary Estimate)*……...	3Q 2004	TBD	TBD	TBD	TBD	TBD

[a] The TEC includes the cost of preliminary and final design appropriated in 01-D-103, PED. This is a preliminary baseline estimate. The performance baseline will be established following completion of preliminary design and Critical Decision 2 (CD-2).

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2001	998 [b]	0	0
2002	6,426	0	0
2003	0	0	0
2004	1,600 [c]	TBD	TBD
2005	6,000	TBD	TBD
2006	0	TBD	TBD
Construction			
2004	8,820 [c]	TBD [d]	0
2005	0	TBD	TBD
2006	22,000	TBD	TBD
2007	22,000	TBD	TBD
2008	22,000	TBD	TBD
2009	21,156	TBD	TBD

3. Project Description, Justification, and Scope

The goal of the TA-18 Mission Relocation Project (MRP) is to provide a secure, modern location for conducting general-purpose nuclear materials handling activities currently conducted at Los Alamos National Laboratory (LANL). TA-18 is the sole remaining facility in the United States capable of performing general-purpose nuclear materials handling experiments and conducting training essential to support national security missions including: (1) research and development (R&D) of technologies in support of Homeland Defense and counter-terrorism initiatives; (2) continued safe and efficient handling and processing of fissile materials; (3) development of technologies vital to implementing arms control and nonproliferation agreements; (4) development of emergency response technologies for response to terrorist attacks and other emergencies; and (5) training for criticality safety professionals, fissile materials handlers, emergency responders, International Atomic Energy Agency professionals, and other Federal and State organizations charged with Homeland Defense responsibilities. The need for this

[a] Design accomplished in 01-D-103, Project Engineering and Design (PED).

[b] The FY 2001 Appropriations Act designated $1,000,000 for initiation of design activities for relocation of TA-18 Nuclear Materials Handling Facility at LANL. The original appropriation was $1,000,000. This was reduced by $2,000 by a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[c] The FY 2004 appropriated amounts have not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

[d] If a decision is made to proceed with this project, some portion of the $8,820,000 for construction would be reprogrammed to PED funds.

project is based on the projected large capital investment for security and infrastructure upgrades required over the next 10 years to remain at TA-18. The NNSA completed environmental reviews and technical and cost studies to evaluate siting options for the TA-18 missions, and designated that the preferred alternative is to relocate a portion of the TA-18 missions to the Device Assembly Facility (DAF) at the Nevada Test Site with the remaining missions residing at LANL. Given the change in direction, conceptual design activities are required to develop detailed project scope, schedules, and budget; however, it is anticipated that this project will include capabilities to house and operate critical assemblies, store associated special nuclear material, and provide infrastructure to support criticality training and detection development activities.

Project Milestones

Complete Conceptual Design	3Q 2004
Complete Preliminary Design (Title I)	TBD
Complete Final Design (Title II)	TBD
Complete Construction (Title III)	TBD
Transition/Closeout	TBD

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Total, Design Phase [a]	TBD	21,024
Construction Phase		
Improvements to Land	TBD	TBD
Buildings	TBD	TBD
Standard Equipment	TBD	TBD
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	TBD	TBD
Construction Management	TBD	TBD
Project Management	TBD	TBD
Total Construction Costs	TBD	TBD
Contingencies		
Construction Phase	TBD	TBD
Total, Line Item Costs (TEC)	TBD	111,000

[a] The TEC includes the cost of preliminary engineering and final design appropriated in 01-D-103, PED. This is a preliminary baseline estimate. The performance baseline will be established following completion of preliminary design and Critical Decision 2 (CD-2).

5. Method of Performance

An acquisition execution plan will be developed during Conceptual Design. Conceptual design activities are assessing the potential to accelerate key project activities in FY 2004, pending the Critical Decision 1 outcome. Options under consideration include construction outside the DAF proper; design, procurement and/or modification of critical assemblies and other equipment; and/or design and procurement of transportation containers.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	0	TBD	TBD	TBD
Construction	0	0	0	0	TBD	TBD
Total, Line item TEC [a]	0	0	0	TBD	TBD	TBD
Total Facility Costs (Federal and Non-Federal)	0	0	0	TBD	TBD	TBD
Other Project Costs						
Other project related costs	7,700	5,957	700	TBD	TBD	TBD
Total, Other Project Costs	7,700	5,957	700	TBD	TBD	TBD
Total Project Cost (TPC)	7,700	5,957	700	TBD	TBD	TBD

[a] The TEC includes the cost of preliminary engineering and final design appropriated in 01-D-103, PED. This is a preliminary baseline estimate. The performance baseline will be established following completion of preliminary design and CD-2.

7. Related Annual Funding Requirements

	(FY 2004 dollars in thousands)	
	Current Estimate	Previous Estimate
Related annual costs (estimated life of project--30 years) [a]		
Annual facility operating costs	TBD	TBD
Facility maintenance and repair costs	TBD	TBD
Programmatic operating expenses directly related to the facility	TBD	TBD
Programmatic capital equipment not related to construction	TBD	TBD
Utility costs	TBD	TBD
Total related annual funding (operating from FY 2004 through FY 2033)	TBD	TBD

[a] Facility operating costs will be developed during the Title I Design.

03-D-102, National Security Sciences Building (NSSB), Los Alamos National Laboratory, Los Alamos, New Mexico

Significant Changes

- This project was proposed as an FY 2004 new start under line item 04-D-104. Congress appropriated funding in FY 2003 under line item 03-D-102. This request continues funding for the project under the line item established in FY 2003.

- This data sheet has been revised to reflect the three distinct phases of this project. Phase I is the construction of the new National Nuclear Security Sciences Building, Phase II is the construction of the Los Alamos Site Office (LASO) Office Building, and Phase III is the decommissioning and demolition (D&D) of the existing SM-43 Administration Building.

- Changes to the Total Estimated Cost (TEC) and Total Project Cost (TPC) amounts reflect escalation and increases in Davis-Bacon labor rates since the original estimate for the project was prepared. The funding amounts contained in this data sheet reflect detailed estimates for the Phase I portion of the project and rough order of magnitude estimates for Phase II and Phase III.

- The Performance Baseline for Phase I was approved on June 9, 2003, and is reflected in this data sheet. Phase II and Phase III are still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change pending approval of the Performance Baseline by the Acquisition Executive at completion of the preliminary design (Critical Decision 2).

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]	Total Project Cost ($000) [a]
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request (*Preliminary Estimate*)	1Q 2004	1Q 2006	3Q 2004	2Q 2007	95,000	118,700
FY 2005 Budget Request *(Current Estimate [b])*	3Q 2003	2Q 2004	4Q 2003	1Q 2006	99,000	123,180

[a] The TEC includes the cost of preliminary and final design and construction of Phase I ($92,000,000), and the preliminary estimate for Phase II, design and construction of the LASO Office Building ($7,000,000). The costs for Phase III, D&D of SM-43, are included as Other Project Costs within the TPC.

[b] The Performance Baseline for Phase I was established on June 9, 2003. Phase II and Phase III are still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change pending approval of the Performance Baseline by the Acquisition Executive at completion of the preliminary design (Critical Decision 2).

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
2003	11,652 [a]	11,652	2,524
2004	50,000 [b]	50,000	55,000
2005	37,348	37,348	40,476
2006	0	0	1,000

3. Project Description, Justification, and Scope

Project Description

The Department of Energy (DOE) has tasked Los Alamos National Laboratory (LANL) with a core mission of enhancing global security by ensuring safety and confidence in the U.S. nuclear weapons stockpile, developing technical solutions to reduce the threat of weapons of mass destruction, and improving the environmental and nuclear materials legacy of the cold war. To carry out this enduring role in the Nation's nuclear weapons program requires LANL to develop/maintain a modern, safe, and reliable infrastructure. In support of this mission need, the National Security Sciences Building Project will replace the 45-year-old SM-43 Building that is no longer suitable as the primary LANL facility for weapons designers, theoretical/computational research, and general management.

The project will provide office and research space to house theoretical and applied physics, computational sciences, and the Laboratory's program and senior management functions in support of the NNSA's Stockpile Stewardship Program (SSP). The National Security Sciences Building Project will continue the development of the theoretical-computational core at LANL that was started in FY 1999 with the Strategic Computing Complex (SCC) and the Nonproliferation and International Security Center (NISC) projects. Additionally, the project will provide a replacement facility for the DOE/NNSA staff that is permanently assigned to Los Alamos. This new facility will allow the DOE/NNSA to proceed with the land transfer commitments that have been made previously with the county of Los Alamos.

Project Justification

The highest priority of the SSP is to ensure the operational readiness of the U.S. Nuclear weapons stockpile. The National Security Sciences Building Project will support this objective by providing modern productive facilities for theoretical and applied physics, computational science, program management and general management that will be important in ensuring stockpile readiness.

[a] Original appropriation was $12,000,000. This was reduced by $76,000 by a rescission and by $272,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

[b] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

Functional, safety and security obsolescence of the existing SM-43 Building is the primary reason that this project is required. The most problematic aspects are as follows:

- **Occupant Safety –** SM-43 has the highest level of occupancy of any building in Los Alamos. Codes and standards have evolved such that the building cannot economically be brought into compliance with today's requirements. The building structure does not meet current DOE or Uniform Building Code seismic requirements. A DOE/NNSA-sponsored structural evaluation, with peer review, indicates the seismic capacity is about 25% of that required by code. Should a design basis earthquake occur, it is anticipated that the SM-43 would experience extensive structural and non-structural damage, and/or collapse. To further support this assessment, recent work to support Executive Order 12941 indicates that SM-43 has the highest seismic risk at the Laboratory. The building design is also not consistent with current National Fire Protection Association life safety codes. For example, the corridors are used for return air plenums, the building lacks sufficient separation walls, and deficiencies in emergency egress requirements exist. The building also has multiple deficiencies regarding compliance with Americans with Disabilities Act requirements.

- **System Reliability –** Most of the major systems are in need of significant investment in order to assure continuation of operations. Building condition evaluations indicate that most of the building systems are inadequate and no longer meet standards for office and light laboratory use. These systems include electrical, mechanical, plumbing, and the building envelope. Not only are many of the systems required to meet demands unforeseen in the early 1950's, but system components are also failing due to age. With these component failures, it is becoming difficult to provide replacement parts. Programmatic work is now being disrupted.

- **Cost of Operations –** SM-43 cannot be operated indefinitely without significant investments for system replacements and upgrading. Although several upgrade projects e.g. fire protection and minor electrical safety upgrades, have been performed in SM-43, no significant "behind-the-wall" investments have been made. It is estimated that this 1955 building requires an additional $445K/year in energy costs over that required for a modern building of similar size. With increasing age and system degradation, the routine maintenance costs have also increased. It has been estimated that a new facility could reduce the operation and maintenance costs by as much as 30% or by several million dollars per year. Estimates to refurbish the existing building exceed $100 million.

- **Security –** Security concerns and the methods to counteract them have changed dramatically in the last 45 years. Need to know compartmentalization cannot be economically implemented in the existing SM-43 building due to the configuration of the electrical and ventilation systems. Compensatory measures needed to ensure the safety of building occupants under the current threat conditions are costly; additional alarm and sensor installation has been "after the fact" and is not optimized, thus increasing operating and maintenance costs. The SM-43 building characteristics make it expensive to meet today's physical and cyber security needs.

- **Work Environment –** An equally important consideration pertains to the building's most fundamental ergonomic deficiencies, or simply, the "human factor." Los Alamos is staffed with employees dedicated to DOE/NNSA missions who are living with the poor work environment, accepting the limitations of very little private space and the failing heating and cooling systems. However, many of these employees are nearing retirement, and the current working conditions are having a negative impact on the Laboratory's ability to recruit new staff. The substandard work environment is impacting not only today's productivity, but also tomorrow's.

- **LASO** - The justification for replacing the DOE/NNSA Los Alamos Site Office (LASO) includes the inefficiencies caused by age, and the fact that the current structure is located on land which has been committed to the County of Los Alamos as a result of the land transfer agreement between DOE and the county. Additionally, the new structure will be located closer to the core of the National Laboratory, within the security perimeter, making communication between NNSA and the contractor more efficient.

Project Scope

Phase I: The National Security Sciences Building (NSSB) is currently planned to be located in TA-3, near the new Strategic Computing Complex and National and International Security Complex facilities. The project includes construction of approximately 275,000 square feet of office space that will house a staff of 700 (approximate) and the Laboratory's Central Records Management operations. The project will also construct a 400-space parking structure and a 600-seat auditorium.

Phase II: A new NNSA LASO building will be built to house approximately 125 - 135 people and includes open meeting rooms to facilitate interfacing with the general public. It will be sited in the TA-3 area near the core facilities of the Laboratory. The facility will have required communication and security features in order that the staff may perform their assigned actions within all existing regulations.

Phase III: The project will decommission and demolish (D&D) the existing SM-43 Administration Building. The D&D of the existing 315,000 square foot SM-43 Building is included as an institutionally funded other project cost (OPC) portion of the project.

Project Milestones:

Phase I NSSB

FY 2003	Establish Performance Baseline/Approve Start of Construction (CD-1/2/3 request)	3Q
	Award Design/Build contract	3Q
	Begin Early Utilities Construction	4Q
FY 2004	Begin Design/Build Construction	2Q
FY 2005	Begin Parking Structure Construction	2Q
	Complete Office Building Shell	3Q
FY 2006	Physical Construction Complete	1Q
	CD-4 Start Operations NSSB	2Q

Phase II LASO Building

FY 2004	Establish Performance Baseline (Critical Decision-2)	1Q

Phase III SM-43 D&D

FY 2006	Establish Performance Baseline (Critical Decision-2)	1Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate [a]	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	5,759	5,668
Design Management costs (0.7% of TEC)	694	782
Project Management costs (1.9% of TEC)	1,901	1,624
Total, Design Costs (8.4% of TEC)	8,354	8,074
Construction Phase		
Improvements to Land	2,208	0
Buildings	59,743	60,544
Other Structures (Parking Structure)	6,047	5,846
Utilities	2,958	3,091
Standard Equipment	1,623	1,735
Removal less salvage	478	0
Inspection, design and project liaison, testing, checkout and acceptance (2.2% of TEC)	2,151	1,845
Construction Management (2.9% of TEC)	2,836	3,780
Project Management (3.7% of TEC)	3,674	3,130
Total, Construction Costs (82.5% of TEC)	81,718	79,971
Contingencies		
Design Phase (0.9% of TEC)	917	599
Construction Phase (8.1% of TEC)	8,011	6,356
Total, Contingencies (9.0% of TEC)	8,928	6,955
Total, Line Item Costs (TEC)	99,000	95,000

[a] The cost estimate reflects detailed estimates for Phase I and rough order of magnitude estimates for Phase II and Phase III.

5. Method of Performance

Design, construction, and procurement of Phase I and Phase II will be accomplished by a competitive best value, fixed-price, and design-build contract. Design-build is a project delivery system where a single entity performs both the design and construction. Some advantages of design-build include a single source for construction activities, cost control and accountability. The Performance Baseline for Phase I was established at Critical Decision 2 (CD-2) on June 9, 2003, based on the selected Design/Build contractor's fixed-price proposal. Outside contractors, under fixed price contracts, will remove existing utilities located on the building sites and install new perimeter utilities, plus construct electrical services to the site. The characterization work for the decommissioning and demolition of SM-43 will be accomplished under a negotiated procurement with a pre-qualified contractor. The demolition work will be accomplished under a competitive solicitation from pre-qualified contractors. The design and construction of the NNSA LASO office building will be a separate procurement and will be managed by the NNSA.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design……………………………………….	0	2,524	6,747	0	0	9,271
Construction…………………………………	0	0	48,253	40,476	1,000	89,729
Total, Line Item TEC………………………..	0	2,524	55,000	40,476	1,000	99,000
Total Facility Costs (Federal & Non-Federal)	0	2,524	55,000	40,476	1,000	99,000
Other Project Costs						
Conceptual design cost……………………..	1,642	603	0	0	0	2,245
NEPA documentation costs……………….	127	5	0	0	0	132
Other ES&H Costs………………………….	23	10	0	0	0	33
Other project-related costs [a] ………………	493	182	221	845	20,029	21,770
Total Other Project Costs…………………….	2,285	800	221	845	20,029	24,180
Total Project Cost (TPC)…………………….	2,285	3,324	55,221	41,321	21,029	123,180

[a] Costs include: Project Management, Quality Assurance, LIR Implementation, Project Execution Plan, Siting Studies, Estimating Support, Scheduling and Controls Support, Safeguards and Security Analysis, Design-Build Procurement, Source Selection work, Value Engineering Study, Fire Hazards Assessment, Permits, Administrative Support, Operations and Maintenance Support, Operating Manuals & Procedures, Operations Testing, Readiness Assessment, and D&D of SM-43.

7. Related Annual Funding Requirements

(FY 2000 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs [a]	2,160	2,160
Annual facility maintenance/repair costs [b]	2,160	2,160
Programmatic operating expenses directly related to this facility [c]	130,000	130,000
Utility costs	1,440	1,440
Total related annual funding (operating from FY 2006 through FY 2026)	135,760	135,760

[a] The costs of operations are based on historical data and averages $4/square foot/year for the Office Building and the Auditorium. A rate of $2/square foot/year was used for the parking structure.

[b] Based on projected annual costs for LANL site services subcontractor as derived from historical maintenance and repair costs for new LANL facilities.

[c] Annual programmatic operating expenses are estimated based on representative operating expenses of 700 people. The majority of this funding is expected to come from DOE/DP for activities in support of the SSP.

03-D-103, National Nuclear Security Administration Project Engineering and Design (PED), Various Locations

Significant Changes

- The TEC for the project increased by a total of $10,067,000:
  - The cost of project engineering and design (PE&D) for preliminary design for the Chemistry and Metallurgy Research Facility Replacement (CMRR) Project has increased by $10,000,000. A full (preliminary and final) Design-Build (D-B) approach for most project activities was the basis for the initial PE&D estimate. The reduction in line item funding in FY 2004-05 has required an alternative approach in order to minimize overall schedule delays. The revised approach will utilize separate preliminary designs, where possible, for all project activities and will rely on Los Alamos National Laboratory (LANL) to conduct more preliminary design work, rather than procuring these services under full D-B contracts. The PE&D funding request in FY 2005 will support continuation of preliminary design and engineering work for all project elements. See project 04-D-125 for additional details on CMRR.
  - The cost of project engineering and design (PE&D) for the Building 12-64 Production Bays Upgrade increased by $67,000 to cover design costs associated with additional scope identified as part of Critical Decision-1.
- The A-E Work Start date has slipped a year due to the re-evaluation of the Chemistry and Metallurgy Research Facility Replacement (CMRR) Project

1. Construction Schedule History

	Fiscal Quarter				
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000) [a]
FY 2003 Budget Request *(A-E and technical design only)*…………………	1Q 2003	4Q 2006	N/A	N/A	63,709
FY 2004 Budget Request *(A-E and technical design only)*…………………	3Q 2003	3Q 2006	N/A	N/A	23,209
FY 2005 Budget Request *(A-E and technical design only)*…………………	1Q 2004	3Q 2007	N/A	N/A	33,276

[a] The TEC estimate is for design only for the subprojects currently included in this data sheet.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
2003	1,106[a]	1,106	0
2004	10,570[b]	16,895	15,300
2005	15,275	15,275	17,976

3. Project Description, Justification, and Scope

This project provides for Architect-Engineering (A-E) services for several National Nuclear Security Administration (NNSA) construction projects, allowing designated projects to proceed from conceptual design into preliminary design and final design. The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance (O&M) funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

The FY 2003 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of preliminary and final design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the Total Estimated Cost (TEC), including physical construction, of each subproject. The final TEC and the Total Project Cost (TPC) for each project described below will be validated and the Performance Baseline will be established at Critical Decision 2 (CD-2), following completion of preliminary design.

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[a] Original appropriation was $11,139,000. This was reduced by $71,000 by a rescission and by $253,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $3,384,000 by a reprogramming. Finally, the FY 2004 Appropriation Act use of PY balances reduction eliminated $6,325,000 from the CMRR subproject, but the funding is required and NNSA plans to restore it with a reprogramming action during FY 2004. The obligations and costs assume this reprogramming action.

[b] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

FY 2003 Proposed Design Projects

03-01: Chemistry and Metallurgy Research Facility Replacement (CMRR) Project, LANL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2004	3Q 2007	3Q 2005	3Q 2012	24,500	500,000-700,000

Fiscal Year	Appropriations	Obligations	Costs
2003	0 [a]	0	0
2004	4,500	10,825	10,000
2005	13,675	13,675	14,500

This subproject includes the design activities required to support the design-build acquisition strategy for the Chemistry and Metallurgy Research Facility Replacement (CMRR) Project at Los Alamos National Laboratory (LANL). The existing Chemistry and Metallurgy Research (CMR) building is a Hazard Category 2 nuclear facility that is over fifty years old. CMR actinide chemistry research capabilities are vital to fulfill several critical LANL missions, including but not limited to, pit rebuild, pit surveillance and pit certification. In January 1999, DOE approved a strategy for managing risks at the CMR facility. This approval committed DOE and LANL on a course to upgrade and temporarily continue to operate the CMR facility through approximately 2010 with operational limitations. This approval also committed DOE and LANL to develop long-term facility and site plans to ensure continuous mission support beyond the year 2010. It was acknowledged that mission support beyond 2010 may require new facilities.

Line item 04-D-125 includes the construction funding for this project.

[a] Original appropriation was $10,000,000. This was reduced by $64,000 by a rescission and by $227,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $3,384,000 by a reprogramming. Finally, the FY 2004 Appropriation Act use of PY balances reduction eliminated the remaining $6,325,000, but the funding is required by the project and NNSA plans to restore it with a reprogramming action during FY 2004. The obligations and costs assume this reprogramming action.

03-02: Building 12-64 Production Bays Upgrade, PX

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2004	1Q 2006	4Q 2005	1Q 2007	2,876	23,000-32,000

Fiscal Year	Appropriations	Obligations	Costs
2003	1,106 [a]	1,106	0
2004	1,670	1,670	2,000
2005	100	100	876

This subproject includes the preliminary and final design for the Pantex Building 12-64 Production Bays Upgrade. This project will lessen the bay shortfall by modifying the bays in Building 12-64 and bringing 17 bays up to the same operational/capacity level as other bays at Pantex. The project will install systems necessary to allow any weapons program to be started in any of the bays in 12-64. Some of the systems installed or modified are the heating, ventilating, and air conditioning system, the dehumidification system, the building electrical system, the hoists and hoist support system, installation of a deluge system, and the installation of a task exhaust system.

The building 12-64 Production Bays Upgrade will provide a crucial asset in meeting the DOE objective of maintaining confidence in the nuclear weapons stockpile. This project will provide modifications to an existing facility to increase capacity to meet the impact of changing weapon complexity, projected workload, and life extension project activities.

Line item 05-D-401 includes the construction funding for this project.

03-03: Energetic Materials Processing Center, LLNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2004	4Q 2005	1Q 2006	4Q 2008	4,400	44,000-60,000

Fiscal Year	Appropriations	Obligations	Costs
2003	0	0	0
2004	2,900	2,900	2,500
2005	1,500	1,500	1,900

This subproject includes the preliminary and final design for the proposed Energetic Materials Processing Center (EMPC) project that replaces existing facilities and energetic material processing equipment that is quickly becoming obsolete and inadequate to meet the mission requirements at Lawrence Livermore National Laboratory (LLNL). This facility will support requirements of the

[a] Original appropriation was $1,139,000. This was reduced by $7,000 by a rescission and by $26,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

Stockpile Stewardship Program, including the National Hydrotest Program, and help meet mission needs in research, development, and directed stockpile work that are not available in other parts of the NNSA/DOE Complex. The EMPC focus is on custom explosives parts, extremely precise assemblies, and work with non-standard weapon explosives. LLNL will continue to rely on Pantex for its explosives production needs. The new facility will be located at LLNL Site 300 and be used to support the Stockpile Stewardship Program. As currently planned, the facility will provide a total of approximately 34,400 gross square feet of space for energetic material machining, radiography, inspection and assembly with separate control rooms, magazines, and a technical support area. Co-location of these currently separate operations will increase efficiency and productivity. By incorporating modern energetic material protection and safety philosophies, the EMPC will be designed to provide an increased level of worker and personnel protection up to 75 kilograms of Class 1 Division 1 explosives. The assembly bays will be designed for 100 kilograms of Class 1 Division 1 explosives. This project will also have the additional benefit of vacating old energetic material facilities that are seriously degraded which will allow for further footprint reduction and reduction of maintenance backlog.

03-04: Tritium Facility Modernization, LLNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2004	4Q 2005	1Q 2006	3Q 2008	1,500	12,000-14,000

Fiscal Year	Appropriations	Obligations	Costs
2003	0	0	0
2004	1,500	1,500	800
2005	0	0	700

A hydrogen isotope research and development capability is needed at LLNL to enable its programs to meet mission objectives in stockpile stewardship and energy research. The proposed Tritium Facility Modernization (TFM) project will modernize the hydrogen isotope research and development capabilities at LLNL and provide an operational hydrogen isotope research capability to meet the mission needs. The modernized capability will focus on the behavior, properties, and uses of hydrogen and its isotopes under a variety of extreme conditions ranging from cryogenic to high temperatures and pressures. Addition of this capability supports stockpile stewardship specifically by providing necessary infrastructure for high energy density physics, weapons effects and tritium/materials R&D, including aging effects on stockpile materials and components, tritium shipping and handling, and reimbursable work-for-others. More generally, it restores an important element of LLNL Research & Development capability in nuclear weapons science and enhances the laboratory's core competency in this vital area. The inertial confinement fusion (ICF) research program at LLNL also requires the capability and other areas of research interest, such as hydride energy storage and tritium/environmental interactions, will benefit from it.

4. Details of Cost Estimate [a]

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase [b]		
Preliminary and Final Design costs (Design Drawings and Specifications)	28,286	19,729
Design Management costs (10% of TEC)	3,330	2,320
Project Management costs (5% of TEC)	1,660	1,160
Total, Design Costs (100% of TEC)	33,276	23,209
Total, Line Item Costs (TEC, Design Only)	33,276	23,209

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Project Engineering and Design	0	0	15,300	17,976	0	33,276
Total, Line Item TEC	0	0	15,300	17,976	0	33,276
Other Project Costs c						
Conceptual design cost	317	870	0	0	0	1,187
NEPA	0	25	50	0	0	75
Other project-related costs	54	115	70	0	2,970	3,209
Total Other Project Costs	371	1,010	120	0	2,970	4,471
Total Project Cost (TPC)	371	1,010	15,420	17,976	2,970	37,747

[a] This cost estimate is based upon direct field inspection and historical cost estimate data, coupled with parametric cost data and completed conceptual studies and designs, when available.

[b] The percentages for Design Management, Project Management, and Design Phase Contingency are estimates based on historical records and are preliminary estimates.

[c] Once line item construction funding is requested, the Other Project Costs associated with the project are included in the construction data sheet and are no longer reflected here.

03-D-121 Gas Transfer Capacity Expansion, Kansas City Plant
Kansas City, Missouri

Significant Changes

- The project baseline was formally changed in January 2004 to incorporate reductions to project scope driven by changes in program requirements and priorities. This data sheet provides the new baseline which reflects the following changes:
  - TPC was reduced by $14,179,000 from $31,388,000 to $17,209,000.
  - TEC was reduced by $13,934,000 from $30,200,000 to $16,266,000.
  - The planned FY 2005 request of $9,905,000 was deleted because it is no longer required to complete the project, and FY 2004 reflects the enacted FY 2004 appropriation reduction of $4,000,000.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost [a] ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY2003 Budget Request *(Preliminary Estimate)*………………………………	3Q 2002	4Q 2003	1Q 2003	2Q 2006	30,200	30,900
FY2004 Budget Request *(Preliminary Estimate)*………………………………..	3Q 2002	4Q 2003	1Q 2003	1Q 2006	30,200	31,388
FY2005 Budget Request *(Performance Baseline)*………………	3Q 2002	1Q 2004	3Q 2003	1Q 2006	16,266	17,209

[a] The TEC includes the cost of preliminary and final design of $991,000 appropriated in 02-D-103, Project Engineering and Design.

2. Financial Schedule [a]

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2002	300	300	163
2003	691 [b]	691	567
2004	0	0	261
Construction			
2003	3975 [c]	3,975	899
2004	11,300 [d]	11,300	10,020
2005	0	0	3,750
2006	0	0	606

3. Project Description, Justification, and Scope

Project Description

This project will provide the Kansas City Plant (KCP) with the required resources to support new designs in reservoir production in addition to the existing production schedules. It will provide the capital equipment and the facility modifications required to expand the current reservoir facility for new gas transfer system production.

The project will expand the current reservoir production department by approximately 7,000 square feet by extending the existing boundaries across an aisle and into the current Model Shop. This expansion area will house new weld and weld finishing equipment. Equipment such as finishing machines, welders, coordinate measuring machine, cleaning equipment, and inspection equipment will be procured as part of this project. The capital equipment plan includes both installation of new equipment and relocation of some existing equipment to improve production efficiency. In addition to this expansion, the A-Room will also be expanded within the existing Reservoir facility by approximately 200 square feet.

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[a] Design funding was appropriated in 02-D-103, Project Engineering and Design.

[b] Original appropriation was $695,000. This was reduced by $4,000 for a rescission and $16,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $16,000 by a reprogramming.

[c] Original appropriation was $4,000,000. This was reduced by $25,000 by a rescission and $91,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $91,000 by a reprogramming.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

Project Justification

The W76 6.2 study has concluded that a need exists for a revised Acorn design and the W87 program is currently planning to implement Acorn during the Limited Life Component Exchange activities. The W80 Acorn, while currently on hold, is also authorized in Phase 6.3. Refurbishment program guidance indicates that the B61 also will require a new Acorn design.

The current gas transfer systems production facilities are not adequate to supply the proposed products. The new generation of gas transfer systems, identified in refurbishment program guidance, require more work than the existing reservoirs that they will replace. This increased workload creates an extensive capacity overload for the existing reservoir facility. The overload covers many years, and cannot be accommodated with existing equipment or a larger staff. Due to security requirements, it is not appropriate to outsource these products.

The current reservoir facility and equipment are at capacity and are inadequate to support the new designs in reservoir production in addition to the existing production schedules. Reservoir workload has already doubled from the original non-nuclear reconfiguration scope and the facility is currently operating two shifts. Additional floor space, beyond the current reservoir facility boundaries, is required for additional equipment. An adjacent facility for weld and weld finishing is required to meet peak reservoir production demands. The expanded capacity is required in FY 2006 in order to meet planned schedules for the W76 and the W80. Failure to have the facility will prevent the KCP from meeting this program schedule. The W76 program has an FY 2007 First Production Unit (FPU) from the KCP, and the W87 system has an FPU date of FY 2009 from the KCP. The W80 program has an FY 2006 FPU from the KCP. Design had to start in FY 2002 and construction in FY 2003 in order to have the facility operational in FY 2006. This expansion will accommodate all reservoir scenarios envisioned in refurbishment guidance and the Master Nuclear Schedule.

Project Milestones

FY 2002:	A-E Work Initiated	3Q
FY 2003:	Physical Construction Starts and Long Lead Procurements	3Q
FY 2004:	A-E Work Completed	1Q
FY 2006:	Physical Construction Complete	1Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Total, Design Phase (6.1% of TEC)[a]	991	995
Construction Phase		
Buildings	1,240	4,010
Standard Equipment	10,600	19,375
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	130	368
Construction Management (3.1% of TEC)	500	993
Project Management (3.1% of TEC)	500	716
Total Construction Costs (79.7% of TEC)	12,970	25,462
Contingencies		
Construction Phase (14.2% of TEC)	2,305	3,743
Total, Line Item Costs (TEC)[b]	16,266	30,200

5. Method of Performance

Design and inspection will be performed under a KCP negotiated architect-engineer contract. Construction will be accomplished by fixed-price contract awarded on the basis of competitive proposals and administered by Honeywell.

[a] Design funding was appropriated in 02-D-103, Project Engineering and Design.

[b] Reflects the revised Performance Baseline established in January 2004.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	163	567	261	0	0	991
Construction	0	899	10,020	3,750	606	15,275
Total, Line Item TEC	163	1,466	10,281	3,750	606	16,266
Other Project Costs						
Conceptual design cost	115	0	0	0	0	115
Other project-related costs	258	150	175	170	75	828
Total Other Project Costs	373	150	175	170	75	943
Total Project Cost (TPC)	536	1,616	10,456	3,920	681	17,209

7. Related Annual Funding Requirements

(FY 2004 dollars in thousands)

	Current Estimate	Previous Estimate
Related Annual Costs (Estimated Life of Project--30 Years)		
Annual Facility Operating Costs………………………………………………….….	3,500	3,500
Total Related Annual Funding (Operating from FY 2006 through FY 2036)…………	3,500	3,500

03-D-123, SNM Component Requalification Facility,

Pantex Plant, Amarillo, Texas

Significant Changes

- This project received approval of a partial Performance Baseline on December 17, 2003. The remaining scope is estimated to be baselined in June 2004.
- As a result of the Preliminary Design, completed in June 2003, and the partial Performance Baseline, the approximate TEC for this project increased by $5,472,000 to $20,813,000 and the approximate TPC increased by $7,056,000 to $23,640,000. The increases are the result of revisions that incorporate adjustments to project scope to better align with the needs of the W76 and other Life Extension Programs (LEPs) and reflect the equipment required for the approved pit requalification process. In addition, project contingencies were increased to address identified project risks (e.g., increased security conditions).
- The construction start date was delayed from first to second quarter of FY 2004.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)[a]	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2003 Budget Request *(Preliminary Estimate)*……………………	2Q 2003	2Q 2004	2Q 2004	2Q 2005	11,300	13,300
FY 2004 Budget Request *(Preliminary Estimate)*……………………	2Q 2003	1Q 2004	1Q 2004	1Q 2006	15,341	16,584
FY 2005 Budget Request *(Preliminary Estimate)*……………………	2Q 2003	2Q 2004	2Q 2004	1Q 2006	20,813	23,640

[a] The TEC includes the cost of preliminary and final design ($1,088,950), which was appropriated in 02-D-103, Project Engineering and Design.

2. Financial Schedule

Fiscal Year	Appropriations	Obligations [a]	Costs [a]
Design [b]			
2002	950	0	0
2003	139[c]	886	629
2004	0	203	460
Construction			
2003	6,620[d]	6,620	6
2004	7,628[e]	8,502	11,398
2005	4,602	4,602	8,053
2006	0	0	267

3. Project Description, Justification, and Scope

This project consists of additions and modifications necessary to convert a portion of Building 12-86 into the Special Nuclear Material (SNM) Component Requalification Facility (CRF), and procurement and installation of the process equipment required for multiple weapon programs.

The Department of Energy (DOE) has given the mission assignment to the Pantex Plant to develop the capability to process pits through recertification and/or requalification (see Record of Decision: Programmatic Environmental Impact Statement for Stockpile Stewardship and Management). In total, approximately 350 pits per year will require either recertification or requalification. These 350 pits will be reused to rebuild War Reserve weapons that are required to maintain the enduring stockpile. Since the recertification and requalification processes are less extensive than reuse, recertification and requalification of 350 pits per year is equivalent to the workload criterion established in the Stockpile Stewardship and Management Program. The process to recertify/requalify existing SNM components is a much more desirable alternative than manufacturing new components. The recertification and requalification concept is more environmentally prudent. The number of pits proposed for recertification or requalification will complement the approximately 20 new pits per year, which will be manufactured by Los Alamos National Laboratory (reference the Programmatic Environmental Impact Statement Stewardship and Management).

[a] Obligations and costs assume a reprogramming of $874,000 from the High Explosives Readiness/Assembly Campaign for process equipment that is now included in the scope of this project.

[b] Design funding was appropriated in 02-D-103, Project Engineering and Design (PED).

[c] Original appropriation was $143,000. This was reduced by $1,000 by a rescission and by $3,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

[d] Original appropriation was $6,620,000. This was reduced by $42,000 by a rescission and by $150,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $192,000 by a reprogramming.

[e] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

Project Milestones

FY 2004:	Establish Performance Baseline (Critical Decision 2)	1Q (partial)
	Establish Performance Baseline (Critical Decision 2)	3Q (complete).

4. Details of Cost Estimate [a]

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Total, Design Costs (5.2% of TEC) b	1,089	1,093
Construction Phase		
Buildings	5,066	3,202
Other Structures	-	241
Standard Equipment	9,423	7,536
Removal Cost Less Salvage	-	86
Construction Management (6.3% of TEC)	1,316	594
Project Management (2.6% of TEC)	531	487
Total, Construction Costs (78.5% of TEC)	16,336	12,146
Contingencies		
Construction Phase (16.3% of TEC)	3,388	2,102
Total, Line Item Costs (TEC)	20,813	15,341

5. Method of Performance

The design services (Title I, II, III) will be accomplished by an outside A-E firm and will be administered by the Managing & Operating (M&O) Contractor (BWXT Pantex, LLC) who will perform equipment design and procurement. The construction services of this project will be performed by an outside construction contractor operating under a contract to be awarded on the basis of competitive bids. This contract will be administered by the M&O Contractor (BWXT Pantex, LLC). Construction Management Services will be performed by the DOE M&O Contractor (BWXT Pantex LLC). Best value practices have been used for design services and will be considered for construction services.

[a] This is still a preliminary estimate based on a partial approved Critical Decision 2.
[b] Design funding was appropriated in 02-D-103, Project Engineering and Design.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	629	460	0	0	1,089
Construction	0	6	11,398	8,053	267	19,724
Total, Line Item TEC	0	635	11,858	8,053	267	20,813
Other Project Costs						
Conceptual design cost	185	0	0	0	0	185
NEPA documentation costs	4	0	0	0	0	4
Other ES&H costs	0	0	0	0	5	5
Other project-related costs	0	200	1,030	1,008	395	2,633
Total Other Project Costs	189	200	1,030	1,008	400	2,827
Total Project Cost (TPC)	189	835	12,888	9,061	667	23,640

7. Related Annual Funding Requirements

(FY2003 dollars in thousands)

	Current Estimate	Previous Estimate
Related annual costs (estimated life of project--30 years)		
Facility operating costs	360	360
Facility maintenance and repair costs..	200	200
Programmatic operating expenses directly related to the Facility	1,500	1,500
Capital equipment not related to construction but related to the programmatic effort in the facility	350	350
Utility costs..	150	150
Total related annual costs (operating from FY 2004 through FY 2033).....................	2,560	2,560

02-D-103, National Nuclear Security Administration, Project Engineering and Design (PED), Various Locations

Significant Changes

- The TEC of this project has been reduced by $26,873,000 due to: the FY 2003 rescission and the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI; and reprogramming actions and cancellations as explained below and in the subproject detail.

- The NNSA Integrated Construction Program Plan (ICPP) is continuously evaluated to ensure program requirements are validated, proposed projects are prioritized, and resources are appropriately allocated. Recent analyses resulted in the following program decisions:

  - The Beryllium Capability Project at Y-12 National Security Complex (formerly titled Beryllium Manufacturing Facility) has been downscoped to provide necessary equipment and facilities to maintain existing beryllium components versus manufacturing new components (05-D-402).

  - The Capability for Advanced Loading Missions (formerly titled Cleaning and Loading Modifications) at the Savannah River Site (SRS) has been modified to deliver a better balance between the capabilities and capacities required in the near-term for the Life Extension Programs (LEPs) and the future projected needs of the weapons program (04-D-127).

  - The Building 12-44 Production Cells Upgrade at Pantex has been updated to incorporate adjustments to project scope, efficiencies and contingencies necessary to address project risks (i.e., increased security conditions). The revised estimates for the project result in a reallocation of funding between design and construction of $1,518,000 that will be proposed for reprogramming during FY 2004.

  - The LIGA Technologies Facility at SNL has been cancelled due to program and budget reviews that have invalidated the mission need for LIGA and LIGA-like microdevices to meet current and future programmatic requirements of refurbishing and modernizing the current nuclear weapon stockpile.

  - The Replacement of the Function Tester (RFT) project at SRS has been cancelled to support higher priority activities, and accept the additional risk and operational constraints associated with continued use of the existing tritium equipment/facilities that were to be augmented by the RFT project. No design or construction funding was obligated for this project.

  The specific details of the changes are discussed in the respective construction line items, and the design funding changes are reflected in this data sheet.

1. Construction Schedule History

	Fiscal Quarter				
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000) [a]
FY 2002 Budget Request (*A-E and technical design only*)	1Q 2002	4Q 2004	N/A	N/A	19,880
FY 2003 Budget Request (*A-E and technical design only*)	1Q 2002	4Q 2005	N/A	N/A	83,275
FY 2004 Budget Request (*A-E and technical design only*)	1Q 2002	4Q 2006	N/A	N/A	54,628
FY 2005 Budget Request (*A-E and technical design only*)	3Q 2002	4Q 2005	N/A	N/A	27,755

[a] The Total Estimated Cost reflected here is the design total for all the subprojects currently included in this data sheet.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations [a]	Costs [a]
Design			
2002	7,337 [b]	4,887	2,104
2003	4,286 [c]	4,458	4,907
2004	10,950 [d]	8,260	5,394
2005	5,250	7,000	10,283
2006	3,150	3,150	5,067

[a] The obligations and costs assume that funds will be reprogrammed as described in the subproject descriptions of this data sheet for: Building 12-44 Production Cells Upgrade (-$1,518,000); the LIGA Technologies Facility (-$1,000,000); and the Beryllium Capability project (-700,000).

[b] Original FY 2002 appropriation of $22,830,000 was reduced by $183,000 as part of the FY 2003 Weapons Activities general reduction, and by $3,010,000 as part of a reprogramming to 01-D-103 for the Purification Facility design. The appropriated amount was further reduced by $2,095,000 as a result of a rescission pursuant to the FY 2002 Supplemental Appropriations Act, P.L. 107-206; by a reprogramming of $4,000,000 from the U1A Support Facilities subproject to RTBF/Operations of Facilities in FY 2003. In addition, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $5,205,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000. Finally, it is reduced by $1,000,000 from the Capability for Advanced Loading Missions project for a proposed reprogramming for the Departmental commitment for EEOICPA.

[c] Original appropriation was $17,306,000. This was reduced by $110,000 for a rescission and by $392,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $1,582,000 by the FY 2003 reduction/reallocation reprogramming. The resulting FY 2003 Comparable Appropriation is $15,222,000. In addition, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $9,169,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000. Finally, the appropriation is further reduced by $1,767,000 for a proposed reprogramming for the Departmental commitment for EEOICPA.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

3. Project Description, Justification, and Scope

This project provides for Architect-Engineering (A-E) services for several National Nuclear Security Administration (NNSA) construction projects, allowing designated projects to proceed from conceptual design into preliminary design and final design. The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These studies define the scope of the project and produce a rough cost estimate and schedule.

FY 2002 PED design projects are described below. While not anticipated, some changes may occur due to developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of preliminary and final design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the Total Estimated Cost (TEC), including physical construction, of each subproject. The final TEC and the Total Project Cost (TPC) for each project described below will be validated and the Performance Baseline will be established at Critical Decision 2 (CD-2), following completion of preliminary design.

FY 2002 Proposed Design Projects

02-01: Test Capabilities Revitalization, Phase I, SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2002	4Q 2003	2Q 2004	3Q 2005	4,481	40,931

Fiscal Year	Appropriations	Obligations	Costs
2002	3,090	3,090	1,203
2003	1,391[a]	1,391	2,461
2004	0	0	817

This subproject provides the preliminary and final design for the Sandia Test Capabilities Revitalization (TCR) project. The TCR project will support urgently needed renovation and renewal work on the physical testing facilities and infrastructure at Sandia National Laboratories (SNL) required to support nuclear weapons refurbishment work. All of the physical test facilities are decades old and in need of very significant repair and maintenance. Some of them are in need of outright reconstitution in order to

[a] Original appropriation was $1,400,000. This was reduced by $9,000 by a rescission and by $32,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased $32,000 by the FY 2003 reduction/reallocation reprogramming.

enable them to meet currently scheduled stockpile refurbishment requirements, or even the minimum anticipated demands over the next few decades. The goal of the proposed Test Capabilities Revitalization (TCR) project is to ensure that SNL is fully prepared to meet the physical testing demands of the stockpile refurbishment mission under any circumstances. An operational "fit-for-use" survey of existing physical testing capabilities, cross-referenced against currently scheduled or reliably anticipated stockpile refurbishment requirements, has revealed the need to renovate, rebuild, or otherwise revitalize up to three dozen different physical testing facilities, the bulk of which are located in Sandia Technical Area III (TA-III). The objective of the proposed TCR project is to redress the aging and deterioration of physical testing facilities and infrastructure in an orderly, integrated, efficient, organized, and cost-effective manner. The testing capabilities revitalization effort has been split into two phases. This design subproject supports only Phase I of the revitalization effort, which includes the Aerial Cable Facility and the Thermal Test Complex.

Line item 04-D-101 includes the construction funding for this project.

02-03: Exterior Communications Infrastructure Modernization (ECIM), SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2002	2Q 2004	3Q 2004	3Q 2006	2,494	22,494

Fiscal Year	Appropriations	Obligations	Costs
2002	1,497	1,497	738
2003	997[a]	997	1,183
2004	0	0	573

This subproject provides the preliminary and final design of the Exterior Communications Infrastructure Modernization (ECIM) project. The objectives of this project are to modernize and integrate the exterior communications duct bank system that provides data, voice, dedicated security communications and facility control systems connectivity within Tech Area I of the SNL/New Mexico (NM) site. The original duct bank system, much of which is still used today, was installed in the 1950s. It is composed of collapsing clay and ceramic duct banks mixed with direct burial cables. Manholes often flood and remain filled with water for long periods of time. Some of the 50-year-old copper cables are constructed with hazardous lead sheathing and deteriorating paper composites that have become unreliable. Optical fiber cables installed in the 1970s have become inadequate in capacity, and are brittle and difficult to maintain and service.

The infrastructure system currently supports a workforce of approximately 9,000 people at the SNL/NM site. Many of the SNL current and emerging capabilities rely heavily on a communications infrastructure. Ideally, this infrastructure enables the high-speed, high-fidelity transmission of data within and between buildings, and across sites, in support of a multitude of mission activities. SNL/NM

[a] Original appropriation was $1,003,000. This was reduced by $6,000 by a rescission and by $23,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased $23,000 by the FY 2003 reduction/reallocation reprogramming.

invested $30 million to modernize the interior cabling systems within most large buildings on the site from 1992 through 1996. Eighty percent of interior telecommunication cabling has been completed, thereby permitting modern internal connectivity and enhanced maintenance cost effectiveness. However, these enabled facilities now communicate between each other with an aging, failing, and incapable inter-building cabling system. The ECIM project addresses these issues and integrates voice, data, security and access control telecommunications systems as well as providing the flexibility to adjust to future requirements. The new exterior infrastructure will provide a combination of new and renovated exterior duct banks, manholes, cabling and building termination equipment within Technical Area I of the SNL/NM site.

Line item 04-D-102 includes the construction funding for this project.

02-04: Replacement of Function Tester, SRS

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
N/A	N/A	N/A	N/A	cancelled	cancelled

Fiscal Year	Appropriations	Obligations	Costs
2003	0 [a]	0	0

Recent analyses resulted in program decisions to: (1) cancel this project to support higher priority activities, and (2) accept the additional risk and operational constraints associated with continued use of the existing tritium equipment/facilities that were to be augmented by the Replacement of the Function Tester project. No design or construction funding was obligated for this project.

[a] Original appropriation was $800,000. This was reduced by $5,000 by a rescission and by $18,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The remaining appropriation of $777,000 was eliminated by the FY 2003 reduction/reallocation reprogramming.

02-05: LIGA Technologies Facility, SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2004	N/A	N/A	N/A	cancelled	cancelled

Fiscal Year	Appropriations	Obligations [a]	Costs [b]
2004	1,500	500	500
2005	0	0	0

A recent program decision was made to cancel this project and to reexamine the mission need for LIGA and LIGA-like microdevices to meet current and future programmatic requirements of refurbishing and modernizing the current nuclear weapon stockpile. Funds were obligated at the beginning of FY 2004 to initiate design prior to this decision. NNSA anticipates recovering a portion of these funds (estimated in this data sheet to be $1,000,000). Any uncosted balance that becomes available will be proposed for reprogramming to meet other priority requirements.

[a] Obligations and costs assume the planned reprogramming of $1,000,000 upon closeout of this cancelled project.

02-08: Beryllium Capability Project (formerly Beryllium Manufacturing Facility), Y-12

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2004	3Q 2005	1Q 2006	2Q 2008	7,000	35,000-45,000

Fiscal Year	Appropriations	Obligations [a]	Costs [a]
2002	0 [b]	0	0
2003	0 [c]	0	0
2004	7,700	7,000	1,800
2005	0	0	5,200

This project provides for the design of the equipment and facilities for the Beryllium Capability (BeC) Project at the Y-12 National Security Complex. This project will provide a new long-term capability to maintain existing Be components versus manufacturing new components.

The BeC Project will replace existing beryllium operational capabilities that are obsolete and inadequate to meet program requirements and environmental, safety, and health (ES&H) requirements. The scope includes capability for cleaning, handling, and inspecting BeO parts as well as sample preparation. An area for a future feature machine operation will also be provided. Much of the existing equipment has deteriorated and is at the end of its useful life. The systems are inefficient and unreliable due to their age and the state of disrepair, and maintenance is difficult and expensive due to the age, contamination levels of the equipment, and difficulty in acquiring spare parts. New equipment will provide an increased level of worker and personnel protection. This project will also have the additional benefit of vacating old facilities that are seriously degraded which will allow for further footprint reduction and reduction of maintenance backlog.

Construction funding for this facility is requested in FY 2005 in line item 05-D-402

[a] Obligations and costs assume the planned reprogramming of $700,000 to the construction line item to support establishment of the performance baseline.

[b] Original FY 2002 appropriation of $7,700,000 was reduced by $800,000 as part of a reprogramming to 01-D-103 for the Purification Facility design. The appropriated amount was further reduced by $1,695,000 as a result of a rescission pursuant to the FY 2002 Supplemental Appropriations Act, P.L. 107-206. Finally, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $5,205,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000.

[c] Original appropriation was $8,665,000. This was reduced by $56,000 by a rescission and by $196,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $876,000 by the FY 2003 reduction/reallocation reprogramming. In addition, the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $6,669,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000. The remaining $868,000 is proposed for reprogramming for the Departmental commitment for EEOICPA.

02-10 Building 12-44 Production Cells Upgrade, PX

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2003	4Q 2004	1Q 2005	1Q 2007	1,050 [a]	10,000-15,000

Fiscal Year	Appropriations	Obligations [a]	Costs [a]
2002	1,500	0	0
2003	1,068[b]	493	67
2004	0	557	983

This subproject provides the preliminary and final design for the Pantex Building 12-44 Production Cells Upgrade (5 Cells). This project will lessen the cell shortfall by modifying five cells in building 12-044. The upgrade will bring these cells up to the same operational/capacity level as other cells at Pantex. The modifications to each of the five cells include:

1.1 Task exhaust installation
1.2 Contaminated Waste Isolation installation
1.3 Dehumidifier installation
1.4 HVAC replacement

The Building 12-44 Production Cells Upgrade will provide a crucial asset in meeting the DOE/NNSA strategic goal of maintaining confidence in the nuclear weapons stockpile. This project will provide modifications to an existing facility to increase capacity to meet the impact of changing weapon complexity, projected workload, and the stockpile refurbishment activities. The W-76 program is the first user to benefit from this additional capacity with other programs to follow.

Line item 04-D-126 includes the construction funding for this project.

[a] Consistent with the preliminary baseline, the total estimated Project Engineering & Design (PED) funding requirement to complete design is $I,050,000. It is planned that $1,518,000 of the PED funding will be reprogrammed to the construction line item to support establishment of the performance baseline in FY 2004. The obligations and costs assume this reprogramming.

[b] Original appropriation was $1,100,000. This was reduced by $7,000 by a rescission and by $25,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

02-11: SNM Component Requalification Facility, PX

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2003	2Q 2004	2Q 2004	1Q 2006	1,089	11,000-22,000

Fiscal Year	Appropriations	Obligations	Costs
2002	950	0	0
2003	139 [a]	886	629
2004	0	203	460

This subproject provides the preliminary and final design for the Pantex Special Nuclear Material (SNM) Component Requalification Facility (CRF). The SNMCRF will be constructed within a section of Building 12-86 which will be reconfigured to meet DOE Order 6430.1A requirements for a hazard Category II Non-Reactor Nuclear Facility, as determined by DOE-STD-1027-92 for hazard potentials and quantities of radioactive material in the facility. Radioactive materials will be handled and process-staged in the SNMCRF. The SNMCRF will be constructed as a vault with Class 5 vault doors at each entrance to establish a new security area that will control and detect unauthorized access into the facility.

The DOE has given the mission assignment to the Pantex Plant to develop the capability to process pits through recertification and/or requalification in the Record of Decision on the Programmatic Environmental Impact Statement for Stockpile Stewardship and Management. In total, approximately 350 pits per year will require either recertification or requalification. These 350 pits will be reused to rebuild War Reserve weapons that are required to maintain the enduring stockpile. The process to recertify/requalify existing SNM components is a much more desirable alternative than manufacturing new components. The recertification/requalification concept is more environmentally prudent as well.

Line item 03-D-123 includes the construction funding for this project.

[a] Original appropriation was $143,000. This was reduced by $1,000 by a rescission and by $3,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI.

02-13: Gas Transfer Capacity Expansion, KC

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2002	1Q 2004	3Q 2003	1Q 2006	991	16,266

Fiscal Year	Appropriations	Obligations	Costs
2002	300	300	163
2003	691 [a]	691	567
2004	0	0	261

This subproject provides the preliminary and final design for the proposed Gas Transfer Expansion project at the Kansas City Plant (KCP). This project will provide the KCP with the required equipment and facility resources to support new designs in reservoir production in addition to the existing production schedules for stockpile refurbishments. It will also provide the capital equipment and the facility modifications required to expand the current reservoir facility for new gas transfer system production.

As currently planned, the project will expand the current reservoir production department by approximately 13,000 square feet by extending the existing boundaries across an aisle and into the current Model Shop. This expansion area will house new weld and weld finishing equipment, and enlarge inspection facilities. The capital equipment plan includes both installation of new equipment and relocation of some existing equipment to improve production efficiency. In addition, the A-Room will be expanded within the existing Reservoir facility by approximately 800 square-feet.

Line item 03-D-121 includes the construction funding for this project.

[a] Original appropriation was $695,000. This was reduced by $4,000 by a rescission and $16,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was increased by $16,000 by the FY 2003 reduction/reallocation reprogramming.

02-14: Capability for Advanced Loading Missions (formerly Cleaning and Loading Modifications) (CALM), SRS

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2005	4Q 2006	4Q 2006	1Q 2009	10,150	35,000-40,000

Fiscal Year	Appropriations	Obligations	Costs
2004 [a]	1,750	0	0
2005	5,250	7,000	5,083
2006	3,150	3,150	5,067

This project has been delayed one year and will now begin design in the 1Q of FY 2005. Funding appropriated in FY 2002 and FY 2003 has been reprogrammed to support other Departmental requirements.

The CALM project supports the mission of the National Nuclear Security Administration (NNSA) to maintain the nuclear weapons stockpile, without underground nuclear testing, to meet national security requirements. This mission is encompassed in the DOE Stockpile Stewardship Program, which ensures the operational readiness of the nuclear weapons through the Directed Stockpile Work (DSW) activities. The DSW program conducts surveillance, maintenance, design, and manufacturing activities required to maintain the nuclear weapons stockpile and to certify the stockpile remains safe, secure, and reliable. Investment in advanced capabilities for the future is essential to ensure the long-term capabilities to accurately assess weapon status and reliability.

The objective of the CALM Project is to provide Savannah River Site (SRS) tritium facilities with the capability and capacity to process the converted W80, W76, and W87 weapons systems tritium reservoirs. This project will modify an existing reservoir loading line to enable cleaning and loading of these new reservoirs as well as add unloading capabilities. This objective is in support of the nuclear weapons Life Extension Programs (LEPs) and will be accomplished while maintaining the limited life component exchange requirements for tritium reservoir loading and unloading. These capability and capacity requirements are given in the NNSA Production and Planning Directive (P&PD) 2001-0, February 2001; P&PD 2002-0; and P&PD 2003-0.

Line item 04-D-127 includes the construction funding for this project.

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[a] Funding appropriated in FY 2002 ($1,000,000) and FY 2003 ($3,399,000 – original appropriation of $3,500.000 which was reduced by $22,000 by rescission and by $79,000 by the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI) was eliminated. the FY 2004 appropriations directed the Department to meet its obligations to make payments to the Ohio Valley Electric Corporation (OVEC) from FY 2004 funding rather than in accord with the Department's proposed reprogramming presented in FY 2003. Funding in the amount of $3,500,000 has been taken from this project to fund a portion of the Weapons Activities total financial responsibility for OVEC of $23,000,000. In addition, $899,000 is proposed for reprogramming for the Departmental commitment for EEOICPA.

4. Details of Cost Estimate [a]

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase [b]		
Preliminary and Final Design costs (Design Drawings and Specifications)…………..	20,820	40,973
Design Management costs (15% of TEC)……………………………………………….	4,160	8,195
Project Management costs (10% of TEC)………………………………………………	2,776	5,460
Total, Design Costs (100% of TEC)……………………………………………………….	27,775	54,628
Total, Line Item Costs (TEC, Design Only)………………………………………………	27,775	54,628

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. Managing & Operating contractor staff may be utilized in areas involving security, production, and proliferation concerns.

[a] This cost estimate is based upon direct field inspection and historical cost estimate data, coupled with parametric cost data and completed conceptual studies and designs, when available. The cost estimate includes design phase activities only.

[b] The percentages for Design Management, Project Management, and Design Phase Contingency are estimates based on historical records and are preliminary estimates.

6. Schedule of Project Funding

	(dollars in thousands)					
	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Project Engineering and Design	2,104	4,907	5,394	10,283	5,067	27,775
Total, Line Item TEC	2,104	4,907	5,394	10,283	5,067	27,775
Total, Facility Costs (Federal and Non-Federal)	2,104	4,907	5,394	10,283	5,067	27,775
Other Project Costs [a]						
Conceptual design costs	700	0	0	0	0	700
Other project-related costs	190	355	250	0	0	795
Total, Other Project Costs	890	355	250	0	0	1,495
Total Project Costs	2,994	5,262	5,664	10,283	5,067	29,250

[a] Once line item construction funding is requested, the Other Project Costs associated with the project are included in the construction data sheet and are no longer reflected here.

02-D-105, Engineering Technology Complex Upgrade, Lawrence Livermore National Laboratory, Livermore, California

Significant Changes

- This data sheet reflects reduced FY 2003 funding for this project as a result of a reprogramming. Changes to the financial schedule and the project completion date, as supported in the Performance Baseline approved in December 2003, are also incorporated.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)[a]	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2003 Budget Request (*Preliminary Estimate*)........................	2Q 2002	4Q 2003	4Q 2002	4Q 2006	26,700	27,700
FY 2004 Budget Request (*Preliminary Estimate*)........................	2Q 2002	3Q 2003	3Q 2002	1Q 2006	26,700	27,700
FY 2005 Budget Request *(Performance Baseline)*......................	2Q 2002	3Q 2003	4Q 2002	4Q 2006	26,700	27,700

[a] The TEC includes the cost of preliminary and final design ($2,250,000), which was appropriated in 01-D-103, Project Engineering and Design.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2002	2,250	2,250	984
2003	0	0	1,214
2004	0	0	52
Construction			
2002	4,674 [b]	4,674	268
2003	4,600 [c]	4,600	5,577
2004	9,776 [d]	9,776	7,318
2005	5,400	5,400	7,735
2006	0	0	3,110
2007	0	0	442

3. Project Description, Justification, and Scope

The Engineering Technology Complex Upgrade (ETCU) project addresses technological obsolescence and corrects code compliance shortfalls associated with structural seismic design of Building 321C. It also upgrades Building 321 A & C to improve current environmental, safety, and health compliance while improving cost effective operations by consolidating and reorganizing laboratory functions in Building 321C.

The Building 321 Complex was constructed in increments, beginning in 1956, to provide engineering fabrication services for research programs at Lawrence Livermore National Laboratory (LLNL). Today, the 47-year-old Complex and associated machine tool equipment are obsolete and do not meet current or anticipated future Weapons Program requirements. Building 321 Complex systems vary in age and condition and generally fail to comply with current seismic design and construction codes, life safety code requirements or environmental health, safety and energy compliance standards. Failure to upgrade the Building 321 Complex will: 1) further degrade existing deteriorated infrastructure, which will increase maintenance costs, continue higher energy use costs, lower operating efficiency, and reduce the quality of manufactured research components; and 2) critical

[a] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

[b] Appropriation of $4,750,000 was reduced by $76,000 for the FY 2002 Weapons Activities general reduction.

[c] Original appropriation was $10,000,000. This was reduced by $63,000 for a rescission and $227,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further reduced by $5,110,000 by a reprogramming. The funding is restored in FY 2005.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

Stockpile Stewardship Program operations will continue to be adversely impacted by the lack of quantity and quality of non-state-of –the-art research components.

The ETCU project upgrades aging Building 321 Complex infrastructure, which supports critical LLNL Defense Programs research activities, including the National Ignition Facility (NIF), Lasers, Computations, Chemistry, and Materials Science and Engineering. LLNL Defense Programs research activities directly support the National Nuclear Security Administration (NNSA) Stockpile Stewardship Program goals and associated NNSA Campaigns. The ETCU Project will benefit the following NNSA Campaigns, which are designed to develop and maintain critical capabilities needed to achieve confidence in the certification of the nuclear weapons stockpile without nuclear testing: the Science Campaign (Primary Certification, Secondary Certification, and Nuclear Systems Margins activities) will benefit from the new enhanced Building 321 fabrication capabilities. The upgraded Complex will directly support Dynamic Materials activities by creating a facility designed to enhance the fabrication of unusual test components for probing material properties. The ETCU project will help achieve Advanced Radiography activities objectives by creating an environment for improving complex, hydro test component fabrication tolerances. The ETCU project is an integral part of the FY 2003 Defense Programs Strategic Plan for LLNL Line Item construction, as documented in the LLNL Ten Year Comprehensive Site Plan.

The ETCU project blends the rehabilitation of Building 321A and C and consolidation of research activities with upgrading machine tool equipment to achieve building and life safety code compliance, enhanced Weapons Program fabrication capabilities and improved operational efficiency. To plan and execute the project performance scope, cost and schedule baselines within the constraints imposed by multi-year funding appropriations, the ETCU project is divided into four separate subtasks. This approach matches the sequencing of construction activities and purchase of long lead equipment to the availability of project funding.

- The B321 Roof Equipment Replacement subtask will replace aging roof mounted HVAC equipment serving Buildings 321A and C and retrofit selected exhaust systems with new HEPA filters to improve facility temperature control and enhance clean laboratory environments. The replacement of roof equipment is being coordinated with the Protection of Real Property: Roofs, Phase II project (99-D-104), which will replace the Building 321Complex roof.
- The B321 Machining Equipment subtask provides for the purchase and installation of new and replacement machine tools, machine tool upgrades and inspection equipment to enhance the B321 precision manufacturing capability.
- The B321C Seismic Upgrade sub task provides for retrofitting the Building 321C structural systems to meet current seismic design standards. Building 321C covers approximately 85,000 square feet in area.

- The Building 321C General Modifications subtask reconfigures approximately 20,000 square feet of existing Building 321C floor space to improve space utilization of the Numerical Control Machining and Ultra-precision Machining areas, consolidate and improve the operational efficiency of the Building 321C Beryllium Machining and Inspection operations, upgrade or replace selected building systems, and modify restrooms to reflect changes in workplace diversity and current accessibility standards.

Project Milestones:

FY 2003:	Start Construction B321 Roof Equipment Replacement	2Q
FY 2004:	Start Activation of B321 Roof Equipment Replacement	3Q
	Start Construction B321C Seismic Upgrade	1Q
	Start Construction B321C General Modifications	1Q
	Complete Construction B321 Roof Equipment Replacement	3Q
FY 2005:	None	
FY 2006:	Complete construction B321C Seismic Upgrade	4Q
	Complete Construction B321 General Modifications	3Q
FY2007:	Project Completion	2Q
	Project Closure Report	4Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Total, Design Phase (8.4% of TEC) [a]	2,250	2,250
Construction Phase		
Buildings	16,323	13,610
Standard Equipment	3,601	4431
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	738	1,070
Construction Management (1.3% of TEC)	370	1,010
Project Management (3.3% of TEC)	878	760
Total Construction Costs (78.3% of TEC)	21,910	20,920
Contingencies		
Construction Phase (13.2% of TEC)	2,540	3,530
Total, Line Item Costs (TEC)	26,700	26,700

[a] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

5. Method of Performance

Design will be performed by a combination of AE firms and LLNL forces. Major construction will be accomplished by negotiated fixed-price delivery order contracts awarded to the LLNL Labor Only Contractor. Selected portions of the B321C Seismic Upgrade subtask will be awarded to sub- subcontractors to the Labor Only subcontractor. Selected minor construction and activation will be done by LLNL forces.

The ETCU Project Execution Plan (PEP) describes the project objectives, scope of work, cost, and schedule, as well as the means, methods, and controls that will be used to achieve the project objectives. The scope is based upon the most current Department of Energy (DOE) Construction Project Data Sheet (CPDS) Budget Request. The PEP is a living document that will be reviewed and revised periodically until the project is complete.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Costs						
Design [a]	984	1,214	52	0	0	2,250
Construction	268	5,577	7,318	7,735	3,552	24,450
Total, Line item TEC	1,252	6,791	7,370	7,735	3,552	26,700
Total Facility Costs (Federal and Non-Federal)	1,252	6,791	7,370	7,735	3,552	26,700
Other Project Costs						
Conceptual design costs	370	0	0	0	0	370
NEPA documentation costs	20	0	0	0	0	20
Other project-related costs [b]	130	0	0	0	480	610
Total, Other Project Costs	520	0	0	0	480	1,000
Total Project Cost (TPC)	1,772	6,791	7,370	7,735	4,032	27,700

[a] Design funding was appropriated in 01-D-103, Project Engineering and Design (PED).

[b] Including tasks such as the Project Execution Plan, Pre-Title I Project Management, Design Criteria, Architect/Engineer Selection, Value Engineering Study, Independent Cost Estimate, Site Surveys, As-Built Surveys, Utility Location Services, Administrative Support, Operations and Maintenance Support, Risk Management Plan, Project Execution Plan, Acquisition Strategy, Critical Decisions Presentations, Project Controls Support, and Internal/External Reviews.

7. Related Annual Funding Requirements

	(FY 2007 dollars in thousands)	
	Current Estimate	Previous Estimate
Annual facility operating costs	1,500	1,500
Total related annual funding (operating from FY 2007 through FY 2025)	1,500	1,500

01-D-103, National Nuclear Security Administration Project Engineering and Design (PED), Various Locations

Significant Changes

- Due to the dynamic nature of the missions performed at Technical Area (TA)-18, conceptual design activities are now expected to be completed in late FY 2004 as preliminary estimates warranted a re-examination of program and project requirements to contain total project costs. Preliminary reviews of the conceptual design have not completely contained project costs and schedule within current funding profiles outlined in this data sheet. As such, the National Nuclear Security Administration (NNSA) senior management will conduct a detailed review of the conceptual design during the second quarter of FY 2004. The review will focus on three key areas: validating the proposed baseline range, assessing the appropriateness of placing some activities within the project versus program, and selecting a project management structure.

- Given the current uncertainty in the project, Project Engineering and Design (PED) funds are requested at a reduced level in FY 2005. A revised data sheet will be submitted pending the outcome of the NNSA senior management review.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2001 Budget Request *(A-E and technical design only)*	1Q 2001	2Q 2002	N/A	N/A	14,500
FY 2002 Budget Request *(A-E and technical design only)*	1Q 2001	4Q 2003	N/A	N/A	110,665
FY 2001 Congressional Budget Supplemental *(A-E and technical design only)*	1Q 2001	4Q 2003	N/A	N/A	82,676
FY 2003 Budget Request *(A-E and technical design only)*	2Q 2001	2Q 2005	N/A	N/A	56,086
FY 2004 Budget Request *(A-E and technical design only)*	2Q 2001	4Q 2005	N/A	N/A	55,122
FY 2005 Budget Request *(A-E and technical design only)*	2Q 2001	3Q 2006	N/A	N/A	TBD

[a] The TEC estimate is for design only for the subprojects currently included in this data sheet.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations [a]	Costs
Design			
2001	22,133 [bc]	21,121	8,583
2002	19,389 [d]	12,849	14,608
2003	0	0	9,528
2004	1,600 [e]	TBD	TBD
2005	6,000	TBD	TBD
2006	0	TBD	TBD

3. Project Description, Justification and Scope

This is the fifth year of a pilot project to provide for Architect-Engineering (A-E) services for several National Nuclear Security Administration (NNSA) construction projects. This allows designated projects to proceed from conceptual design into preliminary design and final design. The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule. The use of a PED line item will enable a project to proceed immediately upon completion of the conceptual design into preliminary and final designs. It will permit acceleration of new facilities, provide savings in construction costs based on current rates of inflation, and permit more mature cost, schedule, and technical baselines for projects when the budget is submitted to Congress.

[a] Obligations are reduced to reflect the planned reprogramming of uncosted balances available after completion of the designs for Atlas Relocation ($14,000), MESA ($31,000) and SURF ($83,000).

[b] The FY 2001 Energy and Water Development appropriation for design and other non-design activities increased the requested appropriation from $14,500,000 to $35,500,000. This was reduced by $78,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[c] The FY 2001 Congressional Budget Supplemental transferred $13,289,000 of the FY 2001 appropriation to 01-D-108 ($9,500,000) and 01-D-107 ($3,789,000).

[d] Includes a reprogramming of $3,010,000 for the Purification Facility subproject.

[e] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

The NNSA has made decisions as to which sub-projects should proceed to Title I design efforts to best support the Stockpile Stewardship mission; the amount of funding to be applied to each of these subprojects is reflected in this data sheet. The FY 2005 request provides funding to continue one subproject not fully funded in previous fiscal years. New NNSA design requests are included in a new FY 2005 PED line item, 05-D-140.

Following completion of preliminary design activities, the NNSA will determine preliminary design project baselines, providing detailed funding and schedule estimates for final design and physical construction. The NNSA will request external independent experts to assess the project scope, schedule and budget. Based upon the results of this assessment, and a review of the continuing programmatic requirement for the project, the NNSA will either cancel further action on the subproject, or set the Performance Baseline for the project while proceeding with final design activities. The preliminary design baseline will be the basis for the request to Congress for authorization and appropriations for physical construction, though some projects may require construction funding for long lead procurements prior to establishment of the performance baseline. Each project that proceeds to physical construction will be separated into an individual construction line item, the total estimated cost (TEC) of which will include the cost of the engineering and design activities funded through the PED line item.

All but one project which began design in this line item have established Performance Baselines and have proceeded to construction, including the Microsystems and Engineering Sciences Applications (MESA) Complex, the Electrical Power Systems Safety, Communications and Bus Upgrades project, the Engineering Technology Complex Upgrade project, the Atlas Relocation to the Nevada Test Site project, and the Purification Facility. One project, the Sandia Underground Reactor Facility, was cancelled following design because the security cost savings envisioned in justification of the project were no longer valid due to a revised Design-Basis Threat and an increase in the estimated cost to construct the facility. Funding is requested for design in FY 2005 only for the Technical Area-18 Mission Relocation subproject.

FY 2001 Design Projects

01-01: Microsystems and Engineering Sciences Applications (MESA), SNL

Fiscal Quarter				Total Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2001	1Q 2003	3Q 2003	3Q 2010	14,925 [a]	462,469

Fiscal Year	Appropriations	Obligations	Costs
2001	10,456	10,456	6,673
2002	4,500 [a]	4,469 [a]	7,426
2003	0	0	826

The Microsystems and Engineering Sciences Applications (MESA) Complex at Sandia National Laboratories in Albuquerque, will be a state-of-the-art national complex that will provide for the design, integration, prototyping and fabrication, and qualification of microsystems into weapon components, subsystems, and systems within the stockpile. Design for this project is complete; line item 01-D-108 includes the construction funding.

01-03: Electrical Power Systems Safety, Communications and Bus Upgrades, NTS

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2002	4Q 2003	3Q 2004	4Q 2005	2,693	16,313

Fiscal Year	Appropriations	Obligations	Costs
2001	0	0	0
2002	2,693	2,693	727
2003	0	0	1,714
2004	0	0	252

The Electrical Power Systems Safety, Communications, and Bus Upgrades project will provide for a new Mercury Distribution Substation and the upgrade of Jackass Flats Substation and Mercury Switching Center. This project received Critical Decision 2 on November 1, 2002, establishing the Performance Baseline, reflected above. Line item 02-D-107 includes the construction funding for this project.

[a] Congress provided $20,000,000 in the FY 2001 appropriation for design and supporting infrastructure upgrades for MESA. The total TEC for design is $15,000,000. This was reduced by $44,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act. Funding for the infrastructure upgrades originally appropriated here in FY 2001 was transferred to line item 01-D-108 as part of the FY 2001 Congressional Budget Supplemental. As of the FY 2005 budget, the design TEC and the obligations and costs now reflect the actual cost of design; the remaining uncosted balance of $31,000 is planned for reprogramming.

01-04: Engineering Technology Complex Upgrade, LLNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2002	3Q 2003	4Q 2002	4Q 2006	2,250	26,700

Fiscal Year	Appropriations	Obligations	Costs
2001	0	0	0
2002	2,250	2,250	984
2003	0	0	1,214
2004	0	0	52

The Engineering Technology Complex Upgrade (ETCU) project will upgrade the Building 321 Complex at Lawrence Livermore National Laboratory (LLNL) which supports the weapons program by manufacturing parts for research programs important to the Stockpile Stewardship Program including the National Ignition Facility (NIF), Lasers, Computations, and the Weapons Program. Line item 02-D-105 includes the construction funding for this project.

01-06: Atlas Relocation to the Nevada Test Site, NTS

Fiscal Quarter				Total Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2001	1Q 2002	1Q 2002	TBD	1,186 [a]	16,272

Fiscal Year	Appropriations	Obligations	Costs
2001	1,200 [a]	1,186 [a]	1,146
2002	0	0	40

This subproject supported the design efforts of a joint team of Los Alamos National Laboratory (LANL), Bechtel Nevada (BN), personnel from other laboratories, and NNSA Nevada Operations Office staff in the development and implementation of the plan to relocate Atlas to the Nevada Test Site. The design has been completed and the project construction was funded under line item 01-D-107.

[a] Original appropriation was $5,000,000. This was reduced by $11,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act, and a total of $3,789,000 in construction funding was transferred to line item 01-D-107 as part of the FY 2001 Congressional Budget Supplemental. As of the FY 2005 budget, the design TEC and the obligations and costs now reflect the actual cost of design; the remaining uncosted balance of $14,000 is planned for reprogramming.

01-07: TA-18 Mission Relocation, LANL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
TBD	TBD	TBD	TBD	TBD	TBD

Fiscal Year	Appropriations	Obligations	Costs
2001	998 [a]	0	0
2002	6,426	0	0
2003	0	0	0
2004	1,600	TBD	TBD
2005	6,000	TBD	TBD
2006	0	TBD	TBD

This subproject provides for preliminary and final design associated with the LANL Technical Area (TA)-18 Mission Relocation Project (MRP), the goal of which is to provide a secure, modern location for conducting general-purpose nuclear materials handling activities currently conducted at LANL TA-18. TA-18 is the sole remaining facility in the United States capable of performing general-purpose nuclear materials handling experiments and conducting training essential to support national security missions including: research and development of technologies in support of Homeland Defense and counter-terrorism initiatives; the continued safe and efficient handling and processing of fissile materials; the development of technologies vital to implementing arms control and nonproliferation agreements; the development of emergency response technologies to respond to terrorist attacks, etc.; training for criticality safety professionals, fissile materials handlers, emergency responders, International Atomic Energy Agency professionals, and other Federal and State organizations charged with Homeland Defense responsibilities. The need for this project is based on the projected large capital investment for security and infrastructure upgrades required over the next 10 years to remain at TA-18. The NNSA recently completed environmental reviews and technical and cost studies to evaluate siting options for the TA-18 missions, and designated that the preferred alternative is to relocate a portion of the TA-18 missions (those requiring Security Category I/II special nuclear material) to the Device Assembly Facility (DAF) at the NTS with the remaining missions (those requiring Security Category III/IV special nuclear material) residing at LANL. The previous preferred alternative was construction of a new facility at LANL. Given the recent change in direction, additional conceptual design activities are required to develop detailed project scope, schedules, and budget; however, it is anticipated that this project will include capabilities to house and operate critical assemblies, store associated special nuclear material, and provide infrastructure to support criticality training and detection development activities.

Due to the dynamic nature of the missions performed at TA-18, conceptual design activities are now expected to be completed in late FY 2004 as preliminary estimates warranted a re-examination of program and project requirements to contain costs. As such, the National Nuclear Security

[a] Original appropriation was $1,000,000. This was reduced by $2,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

Administration (NNSA) senior management will conduct a detailed review of the conceptual design during the second quarter of FY 2004.

01-08: Sandia Underground Reactor Facility (SURF), SNL

Fiscal Quarter				Total Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2001	4Q 2002	Cancelled	Cancelled	3,123 [a]	Cancelled

Fiscal Year	Appropriations	Obligations	Costs
2001	2,696	2,696	764
2002	510 [a]	427 [a]	2,351
2003	0	0	8

This project was cancelled by the NNSA in October 2003 because the security cost savings envisioned in justification of the project were no longer valid due to the recently completed draft Design-Basis Threat (DBT). Coupled with an increase in the estimated cost to construct the facility since establishment of the performance baseline, the payback period for capturing the initial investment increased to the point that the programmatic benefit anticipated for the project was significantly reduced.

[a] As of the FY 2005 budget, the design TEC and the obligations and costs now reflect the actual cost of design; the remaining uncosted balance of $83,000 is planned for reprogramming.

01-09: Purification Facility, Y-12

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Performance Baseline Total Estimated Cost ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2002	3Q 2003	3Q 2003	4Q 2004	9,793 [a]	$37,977

Fiscal Year	Appropriations	Obligations	Costs
2001	6,783	6,783	0
2002	3,010 [b]	3,010	3,080
2003	0	0	5,766
2004	0	0	947

The Purification Facility at the Y-12 Plant will meet both near-term LEP requirements and support projected longer-term weapons program needs. Operations performed within the Purification Facility will include 1) dissolution, filtration, and recrystallization; and, 2) powder processing in a nitrogen atmosphere. Line item 03-D-122 includes the construction funding for this project.

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	TBD	42,722
Design Management costs	TBD	4,800
Project Management costs	TBD	7,600
Design Phase Contingency (current estimates include contingency based on risk analysis)	TBD	0
Total, Design Costs	TBD	55,122
Total, Line Item Costs (TEC)	TBD	55,122

[a] Original amount allocated to this subproject was reduced by $17,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[b] $3,010,000 was reprogrammed to this subproject in FY 2002 to support the increased design TEC.

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, and proliferation concerns.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Design	23,191	9,528	TBD	TBD	TBD	TBD
Total, Line Item TEC	23,191	9,528	TBD	TBD	TBD	TBD
Total, Facility Costs (Federal and Non-Federal)	23,191	9,528	TBD	TBD	TBD	TBD
Other Project Costs [a]						
Conceptual design costs	0	0	0	0	TBD	TBD
Other project-related costs	0	0	0	0	TBD	TBD
Total, Other Project Costs	0	0	0	0	TBD	TBD
Total Project Costs	23,191	9,528	TBD	TBD	TBD	TBD

[a] Once line item construction funding is requested, the Other Project Costs associated with the project are included in the construction data sheet and are no longer reflected here. All design subprojects in this PED line item have either been deferred/cancelled or have a separate line item construction project data sheet.

01-D-124, Highly Enriched Uranium Materials Facility
Y-12 National Security Complex, Oak Ridge, Tennessee

Significant Changes

- With the submittal of this data sheet, this project completes its transition to a revised project management model established by the Department of Energy (DOE) as reflected in DOE Order 413. The project recently completed Preliminary Design and established the Performance Baseline in the first quarter of FY 2004 (Critical Decision 2).
- The Performance Baseline presented in this data sheet includes: additional scope (Reflecto-Active Seals for material accountability); improved definition and cost information for storage elements (rackable can storage boxes, drum trays, and storage racks); facility modifications to respond to revised security threat guidance and improved cost information for security doors; more accurate quantity takeoffs (backfill, piping, ducting); better definition of heating, ventilation, and air conditioning (HVAC) and general support requirements; and, 100 percent estimate for site readiness and early site preparation work. It also includes the cost for resolution of critical foundation and safety authorization issues raised during Preliminary Design.

  Reflecting all these changes and using current overhead and escalation rates, the Total Estimated Cost increased from $184,000,000 to $211,898,000, and the Total Project Cost (TPC) increased from $222,500,000 to $251,198,000 million. This TPC is within the projected range presented in the "Significant Changes" portion of the FY 2004 Congressional Budget Request for this project.

  Start of operations is now scheduled for the third quarter of FY 2008.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2001 Budget Request *(Preliminary Estimate)*……………	1Q 2001	1Q 2002	2Q 2001	2Q 2005	120,000	144,000
FY 2002 Budget Request………..	3Q 2001	4Q 2002	4Q 2001	2Q 2005	119,949 [a]	143,949
FY 2003 Budget Request………..	3Q 2001	4Q 2003	2Q 2002	4Q 2006	119,949	143,949
FY 2004 Budget Request……….	3Q 2002	4Q 2003	3Q 2002	3Q 2006	184,000	222,500
FY 2005 Budget Request *(Performance Baseline)* [b]…………	4Q 2002	1Q 2004	2Q 2003	1Q 2007	211,898	251,198

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
2001	17,710 [c]	17,710	0
2002	0	0	1,242
2003	24,140 [d]	24,140	19,980
2004	45,000 [e]	45,000	29,676
2005	64,000	64,000	53,981
2006	51,000	51,000	86,609
2007	10,048	10,048	15,729
2008	0	0	4,681

[a] Original TEC was $120,000,000. This was reduced by $51,000 for Safeguards and Security (S&S) Amendment in 2001.

[b] This information reflects the Performance Baseline in accordance with DOE Order 413.3 requirements.

[c] The original 2001 appropriation request was $17,800,000. This was reduced by $51,000 by the Safeguards and Security (S&S) Amendment, and by $39,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[d] Original appropriation was $25,000,000. This was reduced by $159,000 for a rescission and by $567,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $134,000 by a reprogramming.

[e] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

3. Project Description, Justification and Scope

The Highly Enriched Uranium (HEU) Materials Facility will support the consolidation of long-term highly enriched uranium materials into a state-of-the-art facility. The new facility will result in cost savings and an increased security posture and will feature: storage in a hardened concrete structure for enhanced security, new Safe Secure Trailer (SST) or Safeguard Transport (SGT) shipping/receiving station, a central location near HEU processing facilities, that includes a small administrative area to house the building operators. This facility will be located in a Protected Area. The Program Requirements Document for the Y-12 National Security Complex HEU Materials Facility, DOE/ORO-2113 Rev.1, documents the minimum storage requirements of 24,000 containers.

The Y-12 National Security Complex Environmental, Safety, and Health (ES&H) Vulnerability Assessment, dated October 1996, resulted in a number of findings related to the current storage of HEU in multiple buildings. The assessment raised issues concerning fire, flooding, natural phenomena, and related concerns that would likely involve major upgrades to existing facilities in order to continue present HEU storage. In addition to ES&H vulnerabilities, existing conditions are inefficient. Maintaining and expanding HEU storage in multiple facilities involves increased security personnel, increased operations personnel, increased maintenance and utility costs, increased Special Nuclear Material (SNM) vehicle transfers, increased cost for ES&H, facility safety assessments and upgrades, and management oversight. Costs for HEU storage will be reduced by implementing this initiative. Cost savings are achieved by reduced personnel requirements, by the efficient use of space and technology, by reduction of the footprint, and by eliminating the necessity for creating additional storage in the old facilities.

This project will provide the following:

- Receipt and storage for Canned Sub-Assemblies (CSAs) as well as cans of uranium oxide and metal
- Docks for SST/SGT shipping/receiving
- A small administrative area inside the facility.

The life expectancy of the facilities is 50 years, thereby assuring a viable, long-term HEU storage capability to support the enduring weapons stockpile and strategic reserve for the foreseeable future.

The facilities will be designed to meet Conduct of Operations requirements, minimize the number of personnel required for operations, and meet DOE requirements for SNM accountability and control.

FY 2005 funding will be utilized to continue facility construction activities.

Project Milestones:

FY 2002:	A-E Work Initiated	4Q
FY 2003:	Physical Construction Started	2Q
FY 2004:	A-E Work Completed	1Q
	Facility Construction Started	2Q
FY 2007:	Physical Construction Completed	1Q
	Startup testing	4Q
	Operational Readiness Review Completed	4Q
FY 2008:	Project Closeout and Begin Operations	3Q

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	19,802	17,610
Design Management costs (.5% of TEC)	1,108	1,095
Project Management costs (1.8% of TEC)	3,731	3,778
Total, Design Costs (11.6% of TEC)	24,641	22,483
Construction Phase		
Buildings [a]	107,442	0
Other Structures	0	102,688
Utilities [a]	5,842	0
Special Equipment [a]	11,325	0
Inspection, design & project liaison, testing, checkout & acceptance (2.7% of TEC)	5,698	0
Other Program Activities b	4,313	9,222
Construction Management (6.3% of TEC)	13,393	10,329
Project Management (3.3% of TEC)	7,094	8,616
Total, Construction Costs (73.2% of TEC)	155,107	130,855
Contingencies		
Design Phase (.4% of TEC)	756	4,497
Construction Phase (14.8% of TEC)	31,394	26,165
Total, Contingencies (15.2% of TEC)	32,150	30,662
Total, Line Item Costs (TEC) [c]	211,898	184,000

[a] Previous data sheets for this project combined costs for Buildings, Utilities and Special Equipment under the Other Structures category. This data sheet correctly reflects the proper cost categories.

[b] Includes FSAR, CAAS Programming, UCNI Security and Project Documentation.

[c] The annual escalation rates assumed are based on forward pricing rates for BWXT labor and approved DOE annual escalation rates for other costs.

5. Method of Performance

Overall project direction and responsibility for this project resides with the NNSA. The NNSA has assigned day-to-day management of project activities to the Y-12 Operating Contractor, BWXT Y-12. BWXT Y-12 completed Conceptual Design of this project utilizing site forces, and has performed initial site readiness and partially completed site preparation activities. Preliminary and detail design for this project was performed by an architectural engineering firm under subcontract to BWXT Y-12. With completion of design, construction and initial component and system testing will be performed via a fixed price construction subcontract to BWXT Y-12. Specialty systems and equipment designed by BWXT Y-12 will be procured by BWXT Y-12 and provided for installation by the construction subcontractor. BWXT Y-12 will perform final connection of the facility to existing plant security and support systems. Following construction, BWXT Y-12 will perform integrated system testing and startup testing of the facility. The NNSA will provide oversight and review of the entire project process, and will perform an Operational Readiness Review at the completion of the project prior to authorization of the facility to begin operations.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	1,242	19,406	4,749	0	0	25,397
Construction	0	574	24,927	53,981	107,019	186,501
Total, Line Item TEC	1,242	19,980	29,676	53,981	107,019	211,898
Other Project Costs						
Conceptual design cost a	1,925	0	0	0	0	1,925
Other project-related costs b	17,275	2,675	1,686	1,031	14,708	37,375
Total Other Project Costs	19,200	2,675	1,686	1,031	14,708	39,300
Total Project Cost (TPC)	20,442	22,655	31,362	55,012	121,727	251,198

[a] A Conceptual Design Report (CDR) and its addendum were completed in FY 2001 at an estimated cost of $1,925,000.

[b] Other project-related prior year costs include $7,010,000 in FY 2000 and $4,125,000 in FY 2001 and $6,140,000 in FY 2002.

Activities supported with this funding include: selection of AE subcontractor and RFP preparation, storage system development, criticality safety evaluations and preparations of technical safety basis documentation, Preliminary safety analysis report, vulnerability analysis, Hazardous Materials Evaluation, preparation of the PEP, design criteria, acquisition plans in support of issuing CD-1, site characterizations, operations support, preparing a waste management plan, finalizing plans for CD-1, site planning and investigations, independent project assessments, ORR support, DNFSB support, and project management and project support.

Costs for moving material into the new facility is not included.

7. Related Annual Funding Requirements [a]

(FY 2009 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs [b]	1,050	1,050
Facility maintenance and repair costs [c]	1,650	1,650
Programmatic operating expenses directly related to the facility [d]	5,900	5,900
Other costs [e]	400	400
Security Forces [f]	0	0
Total related annual funding (operating from FY 2009 through FY 2058)	9,000	9,000

[a] These costs are from the cost/benefit analysis for the defense-in-depth design concept.

[b] Operating costs are the costs of managing the facility.

[c] Facility use costs are combined with the facility maintenance and repair costs.

[d] These are the costs for receipt, storage, and inventory of the contents.

[e] Other costs include the ES&H costs for keeping the facility compliant.

[f] Security forces are funded as a part of the overall site security budget.

99-D-127, Stockpile Management Restructuring Initiative
Kansas City Plant, Kansas City, Missouri

Significant Changes

- The project baseline was formally changed to incorporate adjustments to project scope (reutilized office space, retained vacated space, and inclusion of a Class 100 Mechanism Assembly cleanroom), the FY 2003 rescission and general reduction, and project efficiencies resulting in reduced project contingency requirements. This data sheet provides the new baseline that reflects the following changes:
  - Total Project Cost (TPC) was reduced by $3,061,000 from $138,950,000 to $135,889,000.
  - Total Estimated Cost (TEC) was reduced by $2,671,000 from $120,420,000 to $117,749,000.
  - The planned FY 2005 request of $1,696,000 was deleted because it is no longer required to complete the project.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 1999 Budget Request (*Preliminary Estimate*)........................	1Q 1999	2Q 2004	3Q 1999	3Q 2006	122,500	139,500
FY 2000 Budget Request	2Q 1999	3Q 2004	3Q 1999	2Q 2005	119,500	139,700
FY 2001 Budget Request	2Q 1999	3Q 2004	3Q 1999	2Q 2005	122,400	141,600
FY 2002 Budget Request	2Q 1999	3Q 2004	3Q 1999	2Q 2005	122,201	141,401
FY 2003 Budget Request (*Performance Baseline*).....................	2Q 1999	3Q 2004	3Q 1999	4Q 2005	120,420	138,949
FY 2004 Budget Request	2Q 1999	3Q 2004	3Q 1999	4Q 2005	120,420	138,950
FY 2005 Budget Request (*Current Baseline*)..............................	2Q 1999	3Q 2004	3Q 1999	4Q 2005	117,749	135,889

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
1999	13,700	13,700	153
2000	16,935 [a]	16,935	12,385
2001	23,514 [b]	23,514	24,017
2002	22,200	22,200	18,035
2003	28,925 [c]	28,925	33,006
2004	12,475 [d]	12,475	16,000
2005	0 [e]	0	14,153

3. Project Description, Justification, and Scope

The end of the Cold War radically changed the defense posture of the United States, calling for significant changes and reductions in nuclear weapons complex structure and operations. The initial phase of this retrenchment began when the Department of Energy decided to cease nonnuclear production at three plants and consolidate most of its nonnuclear manufacturing at the Kansas City Plant (KCP). However, even with the influx of new missions, the downturn in defense production meant continued reductions in operating costs and work force.

The Stockpile Management Restructuring Initiative (SMRI) provides a cost-effective plan that capitalizes on the KCP logistic and manufacturing expertise to ensure quality nonnuclear products through the year 2010 and beyond. Furthermore, the initiative minimizes NNSA costs in the near term by lessening risks and reducing operating expenditures concurrent with capital investments. It also provides the technical capability, production capacity, and flexibility necessary to allow the KCP to support scheduled nonnuclear production and a wide range of unanticipated production requirements, confidently and effectively.

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[a] Original appropriation was $17,000,000. This was reduced by $65,000 for the FY 2000 rescission enacted by P.L. 106-113.

[b] Original appropriation was $23,765,000. This was reduced by $199,000 by the Safeguards and Security (S&S) Amendment (the comparable S&S amount for FY 2002 for this project was $142,000; the comparable appropriation amount was $16,793,000). The appropriation was further reduced by $52,000 for a rescission enacted by Section 1403 of the FY 2001 Consolidated Appropriations Act.

[c] Original appropriation was $29,900,000. This was reduced by $190,000 for a rescission and by $678,000 for the Weapons Activities general reduction enacted by P.L. 108-7, FY 2003 Omnibus Appropriations Act, Title VI. The appropriation was further decreased $107,000 by a reprogramming.

[d] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

[e] Planned appropriation was $1,696,000. This was reduced to $0 because it is no longer required to complete the project.

The SMRI will allow the KCP infrastructure to be altered and greatly reduced from the current plant profile, substantially reducing costs to operate the KCP. The restructuring initiative consists of changing the existing plant and operational approach in four major aspects: 1) physically reducing the size of the facility, 2) changing the approach to manufacturing from product-based to process-based, 3) reducing the support infrastructure appropriate for the right-sized operation, and 4) further streamlining the organizational structure to focus directly on the core-manufacturing mission.

Currently, the KCP consists of approximately 3.1 million square feet of floor space contained in three connected buildings: the main building, the Manufacturing Support Building (MSB), and the Technology Transfer Center (TTC). Much of the floor space is underutilized and costly to maintain. The SMRI project is responsible for vacating approximately 409,000 square feet. The KCP will be rearranged into three business units and a support operations business unit to bring about an overall reduction in total managed floor space, streamline operations, and produce increased long-term operating efficiencies in manufacturing processes. The approximate square footage of each business unit after consolidation is as follows:

	Square Ft.	
Electrical Products Business Unit	236,000	
Mechanical Business Unit	350,000	
Engineered Materials Business Unit	198,000	
Support Operations Business Unit	1,224,000	
Unallocated and Unusable	695,000	(includes aisles, restrooms, and utility setbacks)
Total	2,703,000	

The SMRI project supports the implementation of process-based manufacturing by consolidating similar operations into three business units and one support operations unit. These business units are established according to the various electronic, mechanical and engineering materials technologies and processes. The Support Operations unit encompasses the remaining functions. Unless otherwise noted, all of the areas within these business units are impacted by the SMRI project.

- **Electronics Products Business Unit (EPBU) Technology Overview**

The electronics products factory includes three process modules: microelectronics, interconnects, and final assembly. Each electronic process module will fabricate all product lines that require the processes of that module. In addition to the three process modules, there will be three manufacturing areas for specialized products: Joint Test Assembly (JTA), Special Electronic Assembly (SEA), and Test Equipment.

The three process modules are discussed below.

- **Microelectronics:** All substrates, hybrid microcircuits, chip packages, and leadless chip carriers that require clean room processing are fabricated in the state-of-the-art microelectronics module. The module is located in the new microelectronics facility, which was completed in June 1995 and became fully operational in September 1998 (not impacted or part of the SMRI project).

- **Interconnects:** The interconnects module contains the manufacturing of round-wire cables, flat flex cables and junction boxes. These are used to attach and interconnect components. The only two processes affected by SMRI are flat-flex cable and junction box manufacturing.
- **Final Assembly:** The fabrication of complete electronic systems is performed in the final assembly module. This consists of the assembly and encapsulation of all components required for complete electronic products. Procured components, printed wiring assemblies, and manufactured hardware are assembled to produce complete electronic systems such as radars, programmers, trajectory sensing, and firesets.

· **Mechanical Business Unit (MBU) Technology Overview**

The MBU will consist of 14 modules, which will fabricate or procure all required product lines. This is a process-based approach for most mechanical technologies, complemented by generic product-based manufacturing departments, mechanical support laboratories, and engineering services as follows:

- **Mechanical Welding:** Mechanical Welding is a process-based activity group providing welding mechanical hardware and welding operations in common support of factory operations. The in-place consolidation will combine operations, which currently exist in Welding Operations, Interim Reservoir Welding, Model Shop and Tool Room, and the Mechanical Welding Laboratory.
- **Sheet Metal and Mechanical Assembly:** The sheet metal fabrication assembly area will provide common support for a range of mechanical and electromechanical products, and includes typical sheet metal processes as well as laser marking.
- **Electromechanical Assembly:** Electromechanical Assembly will be restructured in a downsized and consolidated operation to provide support of stronglinks and other miniature assemblies which have design features that include miniature solenoids, ceramic electrical headers, miniature springs, friction reducing coatings and bearings, low resistance electrical contacts, magnetically coupled switching, and a host of other unique designs. Most miniature mechanisms require assembly in a class 100 clean environment, utilizing clean benches within a class 100,000 clean room. In addition, the new generation of mechanisms require assembly in a Class 100 clean room. The Class 100 clean room provides the environment and capacity to support WR production and quality requirements.
- **Heat Treating and Abrasive Blasting:** The heat treat and abrasive blasting areas provide service for all mechanical product lines. Included in the relocation of the Heat Treat department is the replacement of a portion of the furnaces and support equipment, which will not survive the relocation due to their poor condition. The structural integrity of the furnaces being replaced is very poor and modifications would be required to refurbish firebrick and heating elements and the equipment may not survive the relocation. Due to the large size of these furnaces and the criticality of this equipment as a unique capability, new furnaces will be procured and installed in the new location prior to excess of the old equipment.
- **Mechanical Machining:** Mechanical machining and inspection will be a downsized and consolidated operation that will fabricate hardware through traditional and non-traditional means in sizes ranging from large case-type housings to miniature piece parts for assemblies. The machined hardware provided by this module would support requirements of all programs at KCP for both internal and external customers.

- **Reservoir Fabrication and Assembly:** Reservoir production responsibility was transferred from the NASA's Rocky Flats Plant to the KCP through the nonnuclear reconfiguration program. Because of special handling, cleaning and contamination considerations associated with reservoir production, KCP's reservoir facility contains most processes necessary to manufacture, test, and inspect a wide variety of production reservoirs. SMRI implementation will not change the Reservoir facility.
- **OST Products Manufacturing:** The Office of Safeguard and Transportation and (OST) Products Manufacturing supports the secure transportation needs for the DOE Secure Transportation Asset including refurbishment of existing trailers, original manufacture of the new design Safeguards Transporter Trailer (SGT) and multiple short-term special maintenance activities. The OST manufacturing area will be consolidated by combining the secure trailer sheet metal area with the primary SGT assembly facility.
- **Mechanical Support Laboratories:** Support laboratories for Mechanical Operations will continue to provide the current types of support, though in a smaller footprint through consolidation.
- **Plastics Molding & Filled Elastomers:** This area supports injection, compression, and transfer molding of thermoset and thermoplastic compounds, and material preparation and compression molding of filled elastomeric products.
- **Foam Products:** Foam Products is a process-based approach, which has combined equipment needed for fabrication of rigid polyurethane foams, filled elastomer foams and foam desiccant product lines.
- **Plastics Machining, Assembly & Inspection:** In the Plastics Machining, Assembly & Inspection module, the manufacturing and machining of all Special Plastics Case Assemblies and Subassemblies, Gas Getters, Composites, and all other plastic products and the related inspection of these products will be consolidated. This consolidation allows for some enhanced utilization of floor space and equipment.

- **Plating & Painting:** These two process modules provide custom metal finishing services to the entire plant. These two operations are not impacted by the SMRI project.

· **Engineered Materials Business Unit (EMBU) Technology Overview**

The engineered materials factory consists of four processing modules as follows:

- **Model Shop and Tool Room:** The Model Shop and Tool Room is a support organization that will provide prototype and evaluation hardware, tool and gage fabrication and maintenance, special grinding of cutting tools, and limited tool design in support of unique and short-cycle time needs of production operations. This area will not be impacted by SMRI.
- **Engineering Laboratories:** The Engineered Materials Business Unit contains several large laboratories. Only the Nuclear Grade Steels Receiving and Inspection, and Non-Destructive Test Labs will be affected by SMRI. The other Engineering Laboratories will remain unchanged.
- **Engineering Services:** The Engineered Materials Business Unit provides document control, drafting, and other support services for the other business units. These functions are primarily office areas, and are not modified in the SMRI project.

- **Metrology:** Metrology provides calibration services to the plant and will not be modified under SMRI.

· **Support Operations Technology Overview**

Support operations includes boilerhouses, waste management operations, patrol headquarters, stores (including enduring stockpile), maintenance, cafeteria, office and other functions that are essential for plant operations. Included under this function is the physical plant separation work for walls and utilities and security guard support during construction. Also included is the construction and relocation of a downsized cafeteria. These functions, generally placed in the category of support, are common to plant operations and are not assigned to a specific factory.

- **Physical Plant Separation:** Maximum Foreseeable Fire Loss (MFL) rated separation between the NNSA and GSA will be provided by construction of fire rated subdivision walls. Major air handling and utilities systems serving both NNSA and GSA will be separated to allow for independent maintenance of these services on both sides of the separation line after the SMRI project is complete.
- **Stores:** Stores' areas will be consolidated and reduced in number. Gages and fixtures, chemicals, and some of the production and non-production stores areas will remain in their current locations. Bulk materials and large production and non-production areas will be relocated and resized to meet future stores requirements. This bulk storage area will be located in a high-roof, unexcavated area of the plant, which is adjacent to a new high-rack storage area.

Project Milestones:

FY 1999:	A-E Work Initiated	2Q
	Physical Construction Started	3Q
FY 2004:	A-E Work Completed	3Q
FY 2005:	Physical Construction Completed	4Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design Costs (Design Drawings and Specifications)	6,525	6,971
Design Management Costs (2.7% of TEC)	3,212	1,046
Project Management Costs (0.2% of TEC)	205	349
Total Design Costs (8.4% of TEC)	9,942	8,366
Construction Phase		
Buildings	37,880	39,460
Standard Equipment	43,008	42,379
Inspection, Design and Project Liaison, Testing, Checkout and Acceptance	2,661	2,812
Construction Management (5.0% of TEC)	5,861	6,189
Project Management (6.8% of TEC)	7,961	7,917
Total Construction Costs (82.7% of TEC)	97,371	98,757
Contingencies		
Design Phase (0.4% of TEC)	496	1,043
Construction Phase (8.4 % of TEC)	9,940	12,254
Total Contingencies (8.9% of TEC)	10,436	13,297
Total, Line Item Costs (TEC)	117,749	120,420

5. Method of Performance

Design and inspection are performed under a KCP negotiated architect-engineer contract. Construction will be accomplished either by fixed-price contract awarded after competitive proposals or by cost plus incentive fee contracts. All contracts will be administered by Honeywell.

Best value contracting methods will be used for design and construction services.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Design	8,696	1,742	0	0	0	10,438
Construction	45,894	31,264	16,000	14,153	0	107,311
Total, Line Item TEC	54,590	33,006	16,000	14,153	0	117,749
Total, Facility Costs (Federal and Non-Federal)	54,590	33,006	16,000	14,153	0	117,749
Other Project Costs						
Conceptual Design Costs	1,000	0	0	0	0	1,000
Other Project-Related Costs	10,959	1,611	450	2,120	2,000	17,140
Total, Other Project Costs	11,959	1,611	450	2,120	2,000	18,140
Total, Project Cost (TPC)	66,549	29,542	16,450	21,349	2,000	135,889

7. Related Annual Funding Requirements

(dollars in thousands)

	Current Estimate	Previous Estimate
Annual Facility Operating Costs[a]	3,700	3,700
Annual Facility Maintenance/Repair Costs	5,400	5,400
Programmatic Operating Expenses Directly Related to the Facility	9,374	9,374
Total Related Annual Funding (Operating from FY 2005 through FY 2034)	18,474	18,474

[a] Estimated life of project-30 years.

Secure Transportation Asset - Program Overview

Funding Schedule by Activity

(dollars in thousands)

Secure Transportation Asset (STA)	FY 2003	FY 2004	FY 2005	$ Change	% Change
Operations and Equipment..................	124,253	122,941	143,873	+ 20,932	+ 17.0%
Program Direction................................	44,295	58,511	57,427	- 1,084	- 1.9%
Subtotal, Secure Transportation Asset..	168,548	181,452	201,300	+ 19,848	+ 10.9%
Use of Prior Year Balances.................	0	- 20,000	0	+ 20,000	- 100.0%
Total, Secure Transportation Asset.............	168,548	161,452	201,300	+ 39,848	+ 24.7%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Secure Transportation Asset	201,300	185,000	185,971	190,014	195,000	957,285

Description

A capability for the safe and secure transport of nuclear weapons, components, and materials that will meet projected Department of Energy (DOE), Department of Defense (DoD), and other customer requirements.

Benefits to Program Goal 01.36.00.00 Secure Transportation Asset
The Secure Transportation Asset is funded under two activities – Operations and Equipment, and Program Direction. Although these are two separately funded activities, the STA is managed as a single program because of the unique structure of the STA as a government owned/government operated organization.

In the current FYNSP schedule, the workload requirements for this program will escalate significantly to support the production schedule for the nuclear weapons stockpile. The accelerated cleanup schedule planned for Hanford by the Environmental Management program requires planning and funding for higher levels of new vehicle and trailer production, as well as, the recruiting and training of additional agents. Both of these endeavors are long lead efforts, taking as long as three years to effectively increase mission capacity. The FY 2004 Energy and Water Development Act, that directed the use of $20 million in prior year balances, has delayed previously planned activities, including the capacity expansion for SGT production and the hiring and training of Federal Agents. The challenge to increase the capacity of the program is coupled with and impacted by national security interests and the associated approval of a new Design Basis Threat posture, which will necessitate the development of a new Safeguards System Security Plan (SSSP). The new posture will require that more assets be employed during the execution of convoys, resulting in a greater need for increased capacity. Related costs for mission training requirements for a larger agent force will increase instructor staff, material costs, and facilities. For FY 2005, $6 million is included under project 05-D-140, Project Engineering and Design to support design of the Albuquerque Transportation and Technology Center, a facility that will consolidate work elements from several inadequate structures.

Secure Transportation Asset - Operations and Equipment

Funding Schedule by Activity

(dollars in thousands)

Secure Transportation Asset Operations and Equipment	FY 2003	FY 2004	FY 2005	$ Change	% Change
Mission Capacity	66,409	73,470	72,271	- 1,199	- 1.6%
Security/Safety Capability	10,393	13,136	13,657	+ 521	+ 4.0%
Infrastructure and C3 Systems	28,925	25,644	24,992	- 652	- 2.5%
Design Basis Threat Response	0	0	18,300	+ 18,300	+ 100.0%
Program Management	18,526	10,691	14,653	+ 3,962	+ 37.1%
Subtotal, Secure Transportation Asset, Operations and Equipment	124,253	122,941	143,873	+ 20,932	+ 17.0%
Use of Prior Year Balances		- 9,400	0	+ 9,400	- 100.0%
Total, Secure Transportation Asset Operations and Equipment	124,253	113,541	143,873	+ 30,332	+ 26.7%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Secure Transportation Asset Operations and Equipment	143,873	117,456	111,308	107,495	105,271	585,403

Description

A capability for the safe and secure transport of nuclear weapons, components, and materials that will meet projected Department of Energy (DOE), Department of Defense (DoD), and other customer requirements.

Benefits to Program Goal 01.36.00.00 Secure Transportation Asset

Within the Secure Transportation Asset – Operations and Equipment program, 5 subprograms each make unique contributions to Program Goal 01.36.00.00. These subprograms accomplish the following: (1) Mission Capacity: agent candidate courses, transportation fleet, aviation services, transport optimization, and contractor utilization. In FY 2005, specific activities focus on: adding secure convoys, producing new escort vehicles and completing upgrades necessary for utilization of the DC-9 aircraft, acquired in FY 2004. (2) Security/Safety Capability: new fleet technologies, intensified agent training, and Security/Safety programs. FY 2005 activities will focus on: testing and evaluating new agent weapons and equipment. (3) Infrastructure and C3 systems: facility maintenance, support for construction projects, command and control communication (C3) systems, and emergency management. FY 2005 activities focus on deploying new VHF radios, producing Mobile Interface Controllers, replacing outdated communications hardware; and establishing the Alternate Transportation Emergency Control Center. (4) Design Basis Threat through the assessment, modification, and application of new state-of-the-art detection and deterrence technology for mobile site security, and (5) Program Management: corporate functions and business operations that control, assist, and direct transport operations.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets. Establish requirements for all elements of support to DOE offices and NNSA, and plan workforce and equipment, accordingly. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Number of secure convoys completed each year (EFFICIENCY MEASURE)	Completed 75 convoys.	Complete >90 convoys.	Complete >100 convoys.	Complete >105 convoys.	Complete >110 convoys.	Complete >120 convoys.	Complete >130 convoys.	A mission capacity of 160 convoys per year in FY 2012
Number of vehicles produced each year to replace the aging fleet of 100 escort vehicles and 46 armored tractors	Replaced 24 vehicles.	Replace ≥20 vehicles.	Replace >14 vehicles.	Replace >15 vehicles.	Replace >5 vehicles.	Begin Design of replacement Escort Vehicle (EVC).	Complete Design of replacement EVC.	Replace 76 escort vehicles and 46 armored tractors in 100 percent of fleet replaced FY 2007 (Initial Task)
Total number of Safeguard Transporters (SGTs) in operation to achieve a fleet of 51 secure trailers	Achieved SGT fleet of 29 trailers.	Produce 3 SGTs; achieve fleet of 32 trailers.	Produce 3 SGTs; achieve fleet of 35 trailers.	Produce 4 SGTs; achieve fleet of 39 trailers.	Produce 4 SGTs; achieve fleet of 43 trailers.	Produce 4 SGTs; achieve fleet of 47 trailers.	Produce 4 SGTs; achieve fleet of 51 trailers.	Achieve SGT fleet of 51 trailers FY 2009

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Mission Capacity	**66,409**	**73,470**	**72,271**

Mission Capacity includes: recruiting, equipping and training new federal agents; vehicle production; safeguards transporter (SGT) production; fleet maintenance; scheduling; and transport optimization. Ongoing activities include: training new recruits in agent candidate training classes; basic support for agents; operations, maintenance, and planned replacement of transportation and training fleets; operation of fixed and mobile mechanical and electronic maintenance facilities; and maintenance and operations of the secure aviation services fleet and facilities. In FY 2005, specific activities focus on: adding secure convoys, producing new escort vehicles and completing upgrades necessary for utilization of the DC-9 aircraft, acquired in FY 2004.

Security/Safety Capability	**10,393**	**13,136**	**13,657**

Security/Safety Capability activities include the design, testing and deployment of new fleet technologies; training and certification; and maintenance of security and safety licenses. Ongoing activities include: designing and evaluating replacement vehicles and trailers; developing and conducting standardized agent and team training to sustain and maintain existing agent skill mix; meeting the safety and security requirements of nuclear explosives duties; developing and conducting operational readiness training; emphasizing individual development, emergency management, and advanced Special Response Force (SRF) training; conducting and supporting liaison with state and local law enforcement organizations; analyzing security methods and equipment; conducting vulnerability assessments; developing the Site Safeguards and Security Plan and Force-on-Force validation exercises and combat simulation computer modeling; and conducting safety studies and safety engineering for the Safety Basis, Nuclear Explosive safety and over-the-road safety issues. FY 2005 activities will focus on: testing and evaluating new agent weapons and equipment; and maintaining existing agent skills. This supports OST mission training requirements for a larger agent force and the development of a new Site Safeguards Security Plan (SSSP).

Infrastructure and C3 Systems	**28,925**	**25,644**	**24,992**

Infrastructure and C3 Systems activities include classified command, control, and communications (C3) activities to enhance required oversight of nuclear convoys; operation of the Transportation Emergency Control Centers (TECCs) and the Emergency Operations Center; maintenance, upgrades, required expansion projects, and leases for STA facilities and their respective equipment; and for web-based initiatives, configuration management, communications maintenance, electronic systems depot maintenance, Mobile Interface Controller (MIC) upgrade, relay station costs, and the Very High Frequency (VHF) radio upgrade. FY 2005 activities focus on: deploying new VHF radios; producing MICs; replacing outdated communications hardware; and establishing the Alternate TECC.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Design Basis Threat Response	**0**	**0**	**18,300**

The new Design Basis Threat (DBT) increases requirements associated with assessing site vulnerabilities. This funding request supports new equipment and training ready for immediate incorporation into mobile operations in response to this new DBT. Many potential technological enhancements judged to effectively bolster security for fixed site facilities have not, as yet, been studied for application to a mobile environment. This funding also supports formally assessing these technologies for best and most cost effective results supporting the development of force multiplying technologies and enhanced detection capabilities.

Program Management	**18,526**	**10,691**	**14,653**

Provides for corporate functions and business operations that control, assist, and direct transport operations. Program Management includes: supplies and equipment: medical contract costs; resident technical support; configuration management, technical document production and regulation; quality studies; professional development; routine STA web support; emergency management processes; and business integration.

Total, Secure Transportation Asset Operations and Equipment	**124,253**	**122,941**	**143,873**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Mission Capacity** The decrease reflects the completion, in FY 2004, of armored tractor production and design and development of new-generation escort vehicle development	- 1,199
▪ **Security/Safety Capability** The increase supports Office of Secure Transportation (OST) mission training requirements for a larger agent force and development of a new Safeguards System Security Plan (SSSP)	+ 521
▪ **Infrastructure and C3 Systems** This decrease reflects minor adjustments to the fielding of the new VHF radios, production of MICs, replacement of outdated communications hardware, and establishment of the Alternate TECC	- 652
▪ **Design Basis Threat Response** This increase reflects implementation of the new Design Basis Threat (DBT) through the assessment, modification, and application of new state-of-the-art detection and deterrence technology for mobile site security....................................	+ 18,300
▪ **Program Management** This increase supports enhanced human reliability requirements, including expanded requirements for annual polygraphs and clinical psychological examinations. The funding also provides for the increased contract medical physicians and staff necessary to support enhanced human reliability requirements..	+ 3,962
Total Funding Change, Secure Transportation Asset Operations and Equipment	+ 20,932

Capital Operating Expenses and Construction Summary

Capital Operating Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	203	209	216	+ 7	+ 3.3%
Capital Equipment	60	62	64	+ 2	+ 3.2%
Total, Capital Operating Expenses	263	271	280	+ 9	+ 3.3%

Secure Transportation Asset Program Direction

Funding Schedule by Activity

(dollars in thousands)

Secure Transportation Asset Program Direction	FY 2003	FY 2004	FY 2005	$ Change	% Change
Salaries and Benefits	37,812	51,050	50,735	- 315	- 0.6%
Travel	5,526	6,384	5,616	- 768	- 12.0%
Other Related Expenses	957	1,077	1,076	- 1	- 0.1%
Subtotal, Secure Transportation Asset, Program Direction	44,295	58,511	57,427	- 1,084	- 1.9%
Use of Prior Year Balances	0	-10,600	0	+ 10,600	- 100.0%
Total, Secure Transportation Asset Program Direction	44,295	47,911	57,427	+ 9,516	+ 19.9%
Full Time Equivalents	391	461	480	+ 19	+ 4.1%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Secure Transportation Asset Program Direction	57,427	67,544	74,663	82,519	89,729	371,882

Description

A capability for the safe and secure transport of nuclear weapons, components, and materials that will meet projected Department of Energy (DOE), Department of Defense (DoD), and other customer requirements.

Benefits to Program Goal 01.36.00.00 Secure Transportation Asset

Within the Secure Transportation Asset – Program Direction program, three subprograms each make unique contributions to Program Goal 01.36.00.00: (1) salaries and benefits - overtime, workman's compensation, and health/retirement benefits, (2) travel - associated with over 100 secure convoys, and (3) other related expenses - professional development, Permanent Change of Station (PCS) moves, and contractual services.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Total number of Federal Agents each year to achieve 420 agents	Achieve agent end-strength >240.	Achieve agent end-strength >266.	Achieve agent end-strength >290.	Achieve agent end-strength >302.	Achieve agent end-strength >322.	Achieve agent end-strength >343.	Achieve agent end-strength >352.	Agent end-strength of 420 by FY 2012.

Detailed Justification

Secure Transportation Asset Program Direction	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
Salaries and Benefits	**37,812**	**51,050**	**50,735**

Provides for the salaries and benefits of the Program staff at Albuquerque, Fort Chaffee, and Washington, D.C., as well as the federal agents and support staff at the three Federal Agent Force locations (Albuquerque, Oak Ridge, and Pantex). Includes overtime, workman's compensation, and health/retirement benefits associated with a staffing level of 480 federal agents and staff.

Travel	**5,526**	**6,384**	**5,616**

Provides for travel associated with over 100 secure convoys, training at other U.S. Government facilities and military installations, and program oversight.

Other Related Expenses	**957**	**1,077**	**1,076**

Provides required training for handling materials by Federal Agent forces and staff professional development. Provides for Permanent Change of Station (PCS) moves and other Contractual Services

Total, Secure Transportation Asset Program Direction	**44,295**	**58,511**	**57,427**

Other Related Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Training	334	354	364	+ 10	+2.8%
PCS Moves	600	700	700	+ 0	+0.0%
Other Contractual Services	23	23	12	- 11	- 47.8%
Total, Other Related Expenses	957	1,077	1,076	- 1	+ 0.1%

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Salaries and Benefits**	
The decrease reflects a rebaselining of this account resulting from higher than anticipated attrition coupled with delays in new recruiting	- 315
▪ **Travel**	
The decrease reflects the utilization of contractors for the dead head miles resulting in a decrease in travel by Federal Agents	- 768
▪ **Other Related Expenses**	
Decrease reflects reduced funding for PCS moves.	- 1
Total Funding Change, Secure Transportation Asset Program Direction	**- 1,084**

Nuclear Weapons Incident Response

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Nuclear Weapons Incident Response					
Emergency Response...............	78,080	83,168	93,119	+ 9,951	+ 12.0%
Emergency Management..........	3,034	5,999	6,090	+ 91	+ 1.5%
Total, Nuclear Weapons Incident Response............................	81,114	89,167	99,209	+ 10,042	+ 11.3%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Nuclear Weapons Incident Response......	99,209	100,136	100,657	98,331	100,609	498,942

Description

The Nuclear Weapons Incident Response (NWIR) program responds to and mitigates nuclear and radiological incidents worldwide. In the FY 2005 budget request, this is a separate control line. Funding was previously included in Readiness in Technical Base and Facilities.

This program provides funding for emergency management and radiological emergency response activities that ensure a central point of contact and an integrated response to emergencies requiring Departmental assistance. Specific attention is focused on providing an appropriate technical response to any nuclear or radiological emergency within the Department, the United States and abroad in accordance with Presidential Decision Directives 39 and 62, the Atomic Energy Act as amended, and Executive Order 12656. This is accomplished through the seven unique Departmental assets for both crisis and consequence management events. Capabilities range from providing radiological assistance in support of state and local agencies to responding to major national or international nuclear/radiological accidents or incidents. In addition, outreach, technical support, training, and exercise support is continually provided to the response community. Asset staffing consists primarily of engineers, scientists, and other technical personnel from the national laboratories, manufacturing facilities and other DOE/NNSA management and operating contractors.

In meeting these mission requirements, the DOE possesses the ability to monitor and predict environmental impacts of radiation at major DOE and other federal agency facilities in the event of a radiological accident or incident. DOE's response is further rounded out by the ability to provide medical and health physics support to radiological accidents and for incident resolution. This requires a close working relationship with federal agencies and the military to support the operations, exercise and training of associates who provide technical assistance in response to the incident/situation.

Benefits to Program Goal 01.37.00.00 Nuclear Weapons Incident Response

Within the Nuclear Weapons Incident Response program, the Emergency Response and Emergency Management subprograms each make unique contributions to Program Goal 01.37.00.00. Emergency Response maintains and provides specialized technical expertise in response to nuclear/radiological incidents, including those involving nuclear weapons. These capabilities include immediate situation resolution, longer-term consequence management, and issues relating to human health. These response teams include Accident Response Group (ARG), the Nuclear Emergency Support Team (NEST), and other assets. Emergency Management provides for the comprehensive, integrated emergency planning, preparedness, and response programs throughout the Department's field operations. The program develops and implements specific programs, plans and systems to minimize the impact of emergencies on national security, worker and public safety, and the environment. The program provides overall coordination and consultation regarding the Department's Emergency Management System.

Annual Performance Results and Targets

NWIR was not part of the NNSA during this entire timeframe and the DOE APP did not include measures for NWIR for these years.

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative number of the 7 designated Radiological Assistance Program (RAP) Regions with a maritime radiation search program.		1	3	5	6	7	7	Establish a maritime radiation search program in the 7 designated RAP Regions by the end of FY 2008.
Cumulative percentage of identified RAP team members (80 of 216) qualified provide technical assistance in managing and executing the response to a radiological or nuclear event.		30%	60%	80%	100%	100%.	100%	Qualify 100% of identified RAP team members (80 of 216) to support the NNSA CMRT by the end of FY 2007. This satisfies the program requirement to have CMRT qualified team members in each of the 8 RAP Regions.
Annual number of "no-notice" emergency management exercises conducted .	Develop and implement a No-Notice emergency management exercise	8	9	10	11	12	12	Conduct annually 12 "no-notice" emergency management exercises by the

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
	program for DOE/NNSA sites.							end of FY 2008.
Annual Triage capability, measured in numbers of calls that could be resolved, to provide remote isotopic identification of an unknown item and determine if a threat exists. (EFFICIENCY MEASURE)		250 calls per year.	300 calls per year.	350 calls per year.	400 calls per year.	450 calls per year.	500 calls per year.	The Triage system will be able to resolve up to 500 calls per year by the end of FY 2009.
Cumulative percentage of emergency response equipment replaced, upgraded, or re-certified by 2009.		15%	30%	45%	60%	75%	100%	Replace, upgrade, or re-certify 100% of FY2003 baseline equipment by the end of FY2009.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Emergency Response	**78,080**	**83,168**	**93,119**

Emergency Response maintains and provides specialized technical expertise in response to nuclear/radiological incidents, including those involving nuclear weapons. These capabilities include immediate situation resolution, longer-term consequence management, and issues relating to human health.

Engineers, scientists, technical personnel from national laboratories and production facilities, and other DOE management and operating contractors supporting the nuclear weapons complex primarily staff the emergency response assets. The radiological assets managed by the NNSA Office of Emergency Operations are staffed by scientists and highly technical personnel holding full-time jobs at national laboratories who agree to serve as volunteers, similar to "volunteer firemen", to deploy in the event of a potential nuclear incident. The pool of potential volunteers is greater than 900 individuals. These volunteers come from a broad mix of DOE scientific facilities and national laboratories. However, specialized assistance is provided largely by the Remote Sensing Laboratory at Nellis Air Force Base, Nevada; Los Alamos; Lawrence Livermore, and Sandia National Laboratories.

Historically, these assets have been maintained as distinct activities; the Accident Response Group (ARG), the Nuclear Emergency Support Team (NEST), and Other Assets. As a result of the September 11th attacks, Emergency Response program activity has increased significantly. Search and response teams remain on full alert. The accelerated pace and additional requirements are likely to continue in response to changing national security and law enforcement needs. To remain responsive, the program is managing the assets as integrated units, using expertise and equipment across funding categories to support mission requirements.

In FY 2005, the NNSA Office of Emergency Operations will work cooperatively with the Department of Homeland Security to continue to provide assistance in emergency situations. Upon direction, the NNSA Office of Emergency Operations will deploy the radiological assets as directed by the Department of Homeland Security, which will act as the Lead Federal Agency (LFA).

Since September 11th, NNSA's response assets have increasingly been a part of security missions led by federal law enforcement agencies. There is a consensus within the counterterrorism community that a psychological threshold has been crossed by terrorist organizations with respect to the use of Weapons of Mass Destruction (WMD) against large civilian populations. Correspondingly, the need to respond to covert and deliberate incident threats, involving WMD, has risen dramatically. Additionally, increased monitoring at the borders and significant proliferation of radiation detection equipment in the hands of law enforcement has resulted in a higher volume of requests for NNSA assistance, comprehensive training, and liaison.

To address these threats more effectively, the NNSA Office of Emergency Operations is restructuring its asset deployment capability to increase geographical coverage and improve response time throughout the country. Radiological Assistance Program (RAP) teams that currently serve in eight RAP regions on

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

a part-time basis will be restructured to provide full-time regional response with increased search and identification capabilities throughout the country.

The restructuring will expand response capabilities to mirror the regions used by the DHS Emergency Preparedness and Response (EP&R) Directorate. Instead of centralized search operations from one location, the assets will be dispersed throughout the country to provide a faster response capability. Each region will have full response capability, and all regions would be interconnected for classified data transmission and home team support. The realignment will also improve coordination with representatives from other responding agencies in the region, such as the Federal Bureau of Investigation (FBI), Environmental Protection Agency (EPA), and Tribal, state and local authorities.

This restructuring will require the redeployment and purchase of additional technical equipment to make each region fully capable of the expanded search and identification mission. The requested funds will support the deployment of necessary equipment, support program operations at the ten regions, and enable acquisition of additional equipment for each region.

	FY 2003	FY 2004	FY 2005
▪ **Accident Response Group (ARG)**	**1,841**	**1,270**	**1,865**

The Accident Response Group (ARG) is a combination of federal and civilian employees with equipment from the NNSA and its national laboratories, standing ready to respond to any accident where nuclear weapons may be involved. ARG was established under a joint agreement between the Department of Defense (DoD) and DOE delineating areas of responsibility and policy for response to peacetime nuclear weapons accidents and nuclear weapons significant incidents within the U.S. and its territories. For DoD and DOE, the responsibilities and scope of this agreement extends worldwide, subject to the provisions of applicable international agreements.

	FY 2003	FY 2004	FY 2005
▪ **Nuclear Emergency Support Team (NEST)**	**53,327**	**57,919**	**66,075**

Under the provisions of the Atomic Energy Act of 1954 and Presidential Decision Directives 39 and 62, government agencies are directed to plan for, train, and resource a robust capability to combat terrorism, especially in the area of WMD. The Nuclear Emergency Support Team (NEST) program was initiated in 1974 to provide DOE/NNSA technical assistance to a LFA DHS, DOE, FBI, EPA, Nuclear Regulatory Commission (NRC), and DOD to deal with incidents, including terrorist threats, that involve the use of nuclear materials. The NEST program has been structured to address threats posed by domestic and foreign terrorists likely to have both the will and means to employ WMD. The NEST response assumes that such an act might occur with little, if any, advanced warning.

Under such circumstances, NEST would respond to assist in the identification and characterization of any nuclear weapon or radioactive device and/or to search for the possibility of additional devices that may have been emplaced and provide assistance for final disposition. In recognition of the increasing potential for such an incident with little or no advance warning, NEST has been restructured to rapidly respond by deploying small, highly capable technical teams to the incident location which require only minimal logistical support to be fully effective.

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

The FY 2005 request includes a $6.5 million increase to support the regionalization of the radiological assets. An additional $1.574 million is requested to continue deployment of the TRIAGE first responder support system initiated as part of the FY 2002 Supplemental Appropriation. TRIAGE provides first responders throughout the country with a "911" type of identification and communication system. A phone call-in number is staffed around the clock to give emergency responders anywhere in the world instant access to expert nuclear scientists in the event of a suspected nuclear situation. Using their analysis of the data transmitted to them via the communications device, the scientists can provide immediate guidance and facilitate deployment of portable detection equipment to determine what type of nuclear material the responder may be facing. TRIAGE is part of the overall priority effort to develop broader geographical coverage and improve response time of emergency responders to address potential nuclear situations.

An additional $1 million is requested to support the regionalization of the asset capabilities by establishing a secure data connection system to provide field response teams with access to libraries of highly technical and sensitive information. The program responders require access to this material to accurately characterize nuclear sources and weapons of mass destruction and determine the appropriate course of action.

	FY 2003	FY 2004	FY 2005
▪ **Other Assets**	**22,912**	**23,979**	**25,179**

Emergency Response also maintains the following additional assets to provide assistance to local, state and other federal agencies and conduct exercises in response to emergencies involving nuclear/radiological materials as well as the detection of biological agents. Additionally, these assets provide support to the NEST and ARG programs to ensure the safe resolution of an incident and protect public safety and the environment.

- The *Aerial Measurement System (AMS)* detects, measures, and tracks radioactive material at an emergency scene to determine contamination levels using fixed and rotary aircraft.

  The FY2005 request includes an $0.8 million increase to provide mandatory aviation safety upgrades to the AMS fixed and rotary aircraft.

- The *Atmospheric Release Advisory Capability (ARAC)* develops predictive plots generated by sophisticated computer models.

- The *Consequence Management Teams* provide the technical capabilities to assist and coordinate federal radiological monitoring and assessment activities and effects with FEMA, NRC, EPA, DoD, state and local agencies, and others.

- The *Radiological Emergency Assistance Center/Training Site (REAC/TS)* provides treatment and medical consultation for injuries resulting from radiation exposure and contamination and serves as a training facility. Additionally, REAC/TS provides training to the medical community and maintains a database of medical responders trained to treat radiation injuries within the United States and abroad.

Emergency Management	**3,034**	**5,999**	**6,090**

Emergency Management provides for the comprehensive, integrated emergency planning, preparedness, and response programs throughout the Department. The program develops and implements specific programs, plans and systems to minimize the impact of emergencies on national security, worker and public safety, and the environment. The program provides overall coordination and consultation regarding the Department's Emergency Management System. This includes emergency assistance and mobilization under the Federal Response Plan to radiological and non-radiological hazardous materials events, or in the event of malevolent threats or nuclear materials smuggling. The program promulgates Departmental requirements and implementing guidance, and conducts emergency preparedness and readiness assurance activities to ensure an effective emergency management system is in place throughout the Department.

The program also coordinates inter-agency and intra-Departmental emergency planning, preparedness and information exchange activities, and coordinates with state and local governments, international agencies, foreign governments, and industry on emergency planning, preparedness and exercise issues.

Total, Nuclear Weapons Incident Response................	**81,114**	**89,167**	**99,209**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ Accident Response Group	
Restores funding to FY 2003 level with incremental increase for escalation............	+ 595
▪ Nuclear Emergency Support Team (NEST)	
Support the regionalization of the radiological assets.	+ 6,500
Continue deployment of the TRIAGE first responder support system	+ 1,574
Establish a secure data connection system for the radiological assets	+ 1,000
Increase for escalation	+ 773
Reduces estimated cost to support National Security Special Events	- 1,691
▪ Other Assets	
Increase provides for mandatory aviation safety upgrades and escalation	+ 1,200
Total, Emergency Response…………………………………………………………	**+ 9,951**
▪ Emergency Management	
Increase is the result of inflation computation	+ 91
Total Funding Change, Nuclear Weapons Incident Response………………………	**+ 10,042**

Facilities and Infrastructure Recapitalization Program

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Facilities and Infrastructure Recapitalization Program					
Operations and Maintenance					
Recapitalization............................	160,653	166,006	206,204	+ 40,198	+ 24.2%
Facility Disposition.........................	51,120	45,000	45,000	+ 0	+ 0.0%
Infrastructure Planning.................	23,701	24,052	40,339	+ 16,287	+ 67.7%
Subtotal, Operations and Maintenance...	235,474	235,058	291,543	+ 56,485	+ 24.0%
Construction	0	3,697	24,681	+ 20,984	+ 567.6%
Total, Facilities and Infrastructure Recapitalization Program..	235,474	238,755	316,224	+ 77,469	+ 32.4%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Facilities and Infrastructure Recapitalization Program						
Operations and Maintenance						
Recapitalization...........	206,204	229,295	275,978	299,317	319,093	1,329,887
Facility Disposition.......	45,000	45,000	45,000	45,000	45,000	225,000
Infrastructure Planning....................	40,339	45,371	50,770	55,397	55,138	247,015
Subtotal, Operations and Maintenance	291,543	319,666	371,748	399,714	419,231	1,801,902
Construction................	24,681	53,041	54,100	72,400	56,300	260,522
Total, Facilities and Infrastructure Recapitalization Program......................	316,224	372,707	425,848	472,114	475,531	2,062,424

Description

The Facilities and Infrastructure Recapitalization Program (FIRP) mission is to restore, rebuild and revitalize the physical infrastructure of the nuclear weapons complex – the third leg of the new Triad, as identified in the *Nuclear Posture Review* dated December 2001 and released by the Administration in January 2002. The program applies new direct appropriations to address an integrated, prioritized series of repair and infrastructure projects focusing on deferred maintenance that will significantly increase the operational efficiency and effectiveness of the NNSA weapons complex sites.

The Facilities and Infrastructure Recapitalization Program (FIRP) is a capital renewal and sustainability program that was established principally to reduce the large backlog of deferred maintenance, which had developed during the 1990s to an appropriate level consistent with industry best practices. The Program also funds an aggressive facilities disposition program to eliminate excess facilities and manages selected utility line items to further reduce the deferred maintenance backlog. The FIRP is separate, distinct, but complementary to the ongoing programmatic base maintenance and infrastructure efforts at NNSA sites. Maintenance and infrastructure are primarily funded by Readiness in Technical Base and Facilities (RTBF) and through site overhead allocations to ensure that facilities necessary for immediate programmatic workload activities are maintained sufficiently. FIRP addresses the additional sustained investments above the RTBF base for deferred maintenance and infrastructure that are needed to extend facility lifetimes, reduce the risk of unplanned system and equipment failures, increase operational efficiency and effectiveness, and allow for the Recapitalization of aging facility systems. FIRP works in close partnership with RTBF to assure the facilities and infrastructure of the nuclear weapons complex are restored to an appropriate condition to support the mission. FIRP is scheduled to complete in 2011. Between now and the time FIRP is completed, the Program will work closely with facilities and infrastructure organizational counterparts at Headquarters and NNSA sites to institutionalize responsible and accountable facility management practices.

Benefits to Program Goal 01.38.00.00 Facilities and Infrastructure Recapitilization Program

Within the Facilities and Infrastructure Recapitilization Program (FIRP), four subprograms each make unique contributions to Program Goal 01.38.00.00. The Recapitalization subprogram funds capital renewal and sustainability projects required to restore the facilities and infrastructure comprising the nuclear weapons complex to an acceptable condition. The FIRP Construction subprogram funds selected utility line-item construction projects across the weapons complex to further reduce the deferred maintenance backlog and satisfy a critical need for improvement to NNSA sites utilities infrastructure. The Facility Disposition subprogram provides funds to accomplish the decontamination, dismantlement, removal and disposal of excess facilities that have been deactivated. The Infrastructure Planning subprogram funds planning activities for next-year Recapitalization projects. Its primary objective is to ensure that projects are adequately planned in advance of project start to permit the timely obligation of construction funds and effective project execution.

Program Assessment Rating Tool (PART)

The Department implemented a tool to evaluate selected programs. PART was developed by the Office of Management and Budget (OMB) to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews.

The current focus is to establish outcome- and output-oriented goals, the successful completion of which will lead to benefits to the public, such as increased national security and energy security, and improved environmental conditions. DOE has incorporated feedback from OMB into the FY 2005 Budget Request, and the Department will take the necessary steps to continue to improve performance.

For the FY 2004 Budget, OMB conducted a PART review on FIRP. The PART assessment noted that the program was well managed. Because the Program is new, with only limited measurable results to date, OMB assigned its highest allowable rating of "Moderately Effective." As a result of the PART recommendations that there may be some overlap between the FIRP program and other NNSA infrastructure related programs, NNSA conducted a review of its infrastructure programs as documented in its Infrastructure Plan for the NNSA Nuclear Complex (3008 Report) dated April 2003, which provides an infrastructure plan for the nuclear weapons complex adequate to support the nuclear weapons stockpile. The 3008 Report, mandated by Congress, advocates maintaining the existing configuration of the NNSA Nuclear Complex. In addition, the NNSA reviews its infrastructure programs annually as part of the Ten Year Comprehensive Site Plan (TYCSP) process in the Fall of each year, beginning with FY 2002. Annual limited updates are submitted each April. NNSA continues to endorse the position regarding the importance of maintaining the existing separate facilities organizations. The NNSA Administration has gone on record with Congress that the two complementary programs Readiness in Technical Base and Facilities (RTBF) and FIRP, are essential to maintaining a responsive infrastructure. FIRP provided OMB an FY 2005 update to its FY 2004 PART.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	Execute oversight of more than 50 FY 2002 Recapitalization Projects consistent with scope, cost, and schedule baselines. (MET GOAL)	Execute a multi-year recapitalization program to arrest the deterioration and reduce the backlog of maintenance and repair projects. (MET GOAL)
		Implement an excess prioritized project list to ensure high priority facilities are demolished, based on NNSA's 10 Year Comprehensive Site Plans (TYCSPs) that result in disposal of over 485,311 square feet of floor space. (MET GOAL)	

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Deferred Maintenance Reduction: Annual dollar amount of deferred maintenance backlog reduced based upon projects that have been issued authorizations to start work (and cumulative percentage of the estimated total deferred maintenance backlog of $1.2 billion to be reduced). The NNSA commitments are to stabilize deferred maintenance by the end of FY 2005 and achieve industry standards by the end of FY 2009 for mission essential facilities and infrastructure. The industry standard is for deferred maintenance to be less than 5% of Replacement Plant Value.	Reduced NNSA's deferred maintenance by $77 million.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $79 million (7% of the estimated FY03 $1.2 billion baseline)	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $156 million (increasing the total deferred maintenance reduction to 20% of the estimated FY03 $1.2 billion baseline) Stabilize deferred maintenance by the end of FY 2005.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $209 million increasing the total deferred maintenance reduction to 37% of the estimated FY03 $1.2 billion baseline)	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $240 million increasing the total deferred maintenance reduction to 57% of the estimated FY03$1.2 billion baseline)	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $272 million increasing the total deferred maintenance reduction to 80% of the estimated FY03$1.2 billion baseline)	By the end of the fiscal year, issue authorizations to start work to achieve a reduction in NNSA's deferred maintenance of $244 million increasing the total deferred maintenance reduction to 100% of the estimated FY03$1.2 billion baseline)	Return the condition of mission essential facilities and infrastructure to industry standards by the end of FY 2009.
Footprint Reduction: Annual gross square feet (gsf) of excess facilities space reduced based upon projects that have been issued authorizations to start work (and cumulative percentage of gsf reduced) to achieve a total of three million gsf of excess facilities space reduced by FY 2009 in support of overall footprint reduction efforts.	Reduced the NNSA footprint by 317,707 gsf increasing the total footprint reduction to approximately 34% of the estimated 3 million gsf that FIRP will disposition by FY 2009. The 34% gsf complete is comprised of: 485,311 gsf of FY 2002	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 325,000 gsf, increasing the total footprint reduction to 45% of the estimated 3 million gsf that FIRP will disposition by FY 2009.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 350,000 gsf, increasing the total footprint reduction to 57% of the estimated 3 million gsf that FIRP will disposition by FY 2009.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 300,000 gsf, increasing the total footprint reduction to 67% of the estimated 3 million gsf that FIRP will disposition by FY 2009.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 275,000 gsf, increasing the total footprint reduction to 77% of the estimated 3 million gsf that FIRP will disposition by FY 2009.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 275,000 gsf, increasing the total footprint reduction to 85% of the estimated 3 million gsf that FIRP will disposition by FY 2009.	By the end of the fiscal year, issue authorizations to start work to achieve a reduction to the NNSA footprint of 443,440 gsf, increasing the total footprint reduction to 100% of the estimated 3 million gsf FIRP will disposition by FY 2009.	Reduce the NNSA footprint by three million gross square feet (gsf) by FY 2009. (Three million gsf has been established as a stretch goal).

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
	FY 2002 projects completed within FY 2002; 228,542 gsf of FY 2002 projects completed in FY 2003; and 317,707 gsf of FY 2003 projected completed in FY 2003.							
Infrastructure Planning: Percentage of "next year" planned Recapitalization projects that are planned with current year planning funds. (EFFICIENCY MEASURE) This is an efficiency measure. Credible up-front planning of projects will result in improved efficiencies in ability to obligate funds and execute projects.	Approximately 56% of FIRP Recap. projects were planned in advance of the fiscal year that the projects will be started.	At least 53% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	At least 56% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	At least 59% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	At least 62% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	At least 65% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	At least 68% of FIRP Recap. projects will be planned in advance of the fiscal year that the projects will be started.	Not Applicable. This is an efficiency measure.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Recapitalization (Operations and Maintenance).........	**160,653**	**166,006**	**206,204**

Recapitalization funds capital renewal and sustainability projects required to restore the facilities and infrastructure comprising the nuclear weapons complex to an acceptable condition. NNSA has established corporate commitments/performance goals to stabilize deferred maintenance by FY 2005 and reduce the residual deferred maintenance backlog to industry standards by FY 2009 (5% or less of replacement plant value) for mission essential facilities and infrastructure. The primary executor of these corporate commitments, and the recovery of the complex, is the Recapitalization subprogram. Recapitalization funds projects in accordance with established criteria and priorities that target deferred maintenance reduction and repair (non-programmatic) of mission essential facilities and infrastructure. These projects are key to restoring the facilities that house the people, equipment, and material necessary to support scientific research, production, or testing to conduct the Stockpile Stewardship Program, the primary NNSA mission. Recapitalization also includes construction/renovation projects (non-programmatic) that renovate landlord or multi-program facilities, address adaptive reuse (conversion) or alterations to existing facilities, bring existing production and laboratory facilities into compliance with mandated codes and/or standards, or reduce the site landlord's total ownership costs of facilities and infrastructure. FIRP will invest a minimum of $5 million in FY 2004 and an additional $15 million in FY 2005 on the complex-wide Roof Asset Management Program to establish and implement a corporate approach for the management of NNSA's roofing assets. Benefits of the Roof Asset Management Program include improved cost efficiencies, improved quality and life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction.

The focus of the Recapitalization subprogram in FY 2005 will be on achieving NNSA's aggressive corporate goal to stabilize complex-wide deferred maintenance by the end of FY 2005. The NNSA has established its deferred maintenance baseline and will track progress against deferred maintenance reduction performance goals.

FIRP Construction...	**0**	**3,697**	**24,681**

FIRP Construction funds selected utility line-item construction projects across the weapons complex to further reduce the deferred maintenance backlog and satisfy a critical need for improvement to NNSA sites utilities infrastructure. These projects are expected to result in increased efficiencies because it is typically more cost effective to replace, rather than maintain, aging utilities. Generally, the projects exceed the General Plant Project (GPP) funding threshold and may include: electrical power distribution, central steam systems and distribution, central chilled water facilities and distribution, water supply systems, sanitary waste disposal systems, and natural gas distribution systems. FIRP Construction also funds the Project Engineering and Design (PED) of utility line item construction projects. FIRP initiated Planning, Engineering, and Design (PED) in FY 2004 and will begin construction in FY 2005 for selected utility line item projects, consistent with Project Data Sheets. These projects will enhance program execution, satisfy a critical need for improvement to NNSA sites' utilities infrastructure, and make a significant contribution to the overall reduction of

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

deferred maintenance. Initial planning and conceptual design activities for proposed FIRP utility line item construction projects (i.e., Other Project Costs) are funded from the Infrastructure Planning subprogram. These construction projects meet the criteria for funding within the FIRP Program and are managed in accordance with current Department of Energy and NNSA orders and policies.

▪ **05-D-160, FIRP Project Engineering and Design (PED) Project**..	**0**	**0**	**8,700**

This FIRP PED project provides for Architect-Engineering (A-E) services (Title I and Title II) for several Facilities and Infrastructure Recapitalization Program (FIRP) utility construction projects that begin in FY 2005 (i.e., TA I Heating System Modernization (HSM) at Sandia National Laboratories, Steam Plant Life Extension Project (SPLEP) at Y-12 National Security Complex, and Electrical Distribution System Upgrade (EDSU) and Gas Main and Distribution System Upgrade (GMDSU) at Pantex Plant) allowing designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II). The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

▪ **05-D-601, Compressed Air Upgrades Project**	**0**	**0**	**4,400**

This project provides funding to construct the Compressed Air Upgrades Project (CAUP). The objective of this project is to rehabilitate the existing compressed air capability at the Y-12 National Security Complex to maintain a reliable, cost-efficient compressed air capability for the current and future buildings and facilities that will in turn ensure continued operations of Y-12's production facilities. PED funding is provided under 04-D-203 for Architect Engineering services to develop and complete preliminary and final (Title I and II) design of the CAUP.

▪ **05-D-602, Power Grid Infrastructure Upgrade**	**0**	**0**	**10,000**

The primary objective of this project is to construct the Southern Technical Area substation, install a new 115kV transmission line, and address deferred maintenance issues at the Eastern Technical Area substation, thus eliminating future vulnerabilities to the power supply and distribution systems in Los Alamos. This project will be acomplished through a design-build acquisition method, which is standard industry practice for this type of project. Design and construction will proceed in parallel Therefore, there are no PED funds shown for this project.

▪ **05-D-603, New Master Substation, Technical Areas I and IV**	**0**	**0**	**600**

This project provides long-lead procurement of the transformer for the New Master Substation Utility for Technical Areas I and IV at Sandia National Laboratories in Albuquerque, New

(dollars in thousands)

Mexico. The procurement mitigates the significant risk to project schedule and cost identified during the Conceptual Design Report (CDR) phase related to purchase of the main transformer. The project will enable procurement and delivery of the main transformer to the site in concert with the beginning of construction scheduled to start in FY 2006. PED funding is provided under 04-D-203 for Architect-Engineering (A-E) services to develop and complete preliminary and final (Title I and II) design of the New Master Substation.

	FY 2003	FY 2004	FY 2005
04-D-203, FIRP Project Engineering and Design (PED) Project	**0**	**3,697**	**981**

This FIRP PED project provides for Architect-Engineering (A-E) services (Title I and Title II) for two utility construction projects that begin in FY 2004 (i.e., Compressed Air Upgrades Projects at Y-12 National Security Complex and the New Master Substation, Technical Area 1 and IV at Sandia National Laboratories) allowing designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II). The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

	FY 2003	FY 2004	FY 2005
Facility Disposition	**51,120**	**45,000**	**45,000**

Facility Disposition provides funds to accomplish the decontamination, dismantlement, removal and disposal of excess facilities that have been deactivated. This includes facilities that are excess to current and future NNSA mission requirements and are not weapons' process contaminated. The Program has established a performance goal to reduce the NNSA footprint by three million gross square feet by FY 2009. Annual targets are in place that demonstrate tangible progress towards this goal. Facility Disposition activities reduce Environment, Safety and Health (ES&H) and safeguards and security requirements, address a portion of the necessary footprint reduction of the complex, improve management of the NNSA facilities portfolio, and reduce long-term costs and risks. FIRP Facility Disposition provides an economical approach to meeting the direction of Congress and supports overall NNSA footprint reduction efforts. Recent independent reviews of disposition costs indicate that the unit costs (i.e., dollars per square foot) compare very favorably with industry norms for the disposition of similar facilities. The FY 2005 FIRP annual performance target focuses on reducing the NNSA footprint by an additional 350,000 gross square feet bringing the total to approximately 57% of the estimated three million gross square feet FIRP will disposition by FY 2009.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Infrastructure Planning	**23,701**	**24,052**	**40,339**

timely obligation of construction funds and effective project execution. The Infrastructure Planning subprogram supports the establishment of Recapitalization project baselines; planning and design for priority general infrastructure projects, to include FIRP utility line items; contract preparation and other activities necessary to ensure the readiness to obligate and execute funds. Infrastructure Planning also funds Other Project Costs (OPC) in anticipation of FIRP Project Engineering and Design (PED) and Construction for FIRP utility line items. Other key activities funded by this subprogram include assessments of the physical condition of the complex to aid in the prioritization of deferred maintenance reduction and facility consolidation efforts; Army Corps of Engineer activities, which are being accomplished under an Interagency Agreement, to support the procurement of small business contracts; and planning for the repair and renewal of cross-complex roofing projects. The FY 2005 annual performance target for this subprogram is that at least 56% of the FIRP Recapitalization projects will be planned in advance of the fiscal year the project is started.

Total, Facilities and Infrastructure Recapitalization Program	**235,474**	**238,755**	**316,224**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
Recapitalization	
▪ **Operations and Maintenance –** Increase reflects the continued required ramp-up in funding to improve the condition of the complex and is in accordance with internal and external assessments that found funding in the past has not been sufficient to solve the backlog problem. Funding increase is consistent with the NNSA Future-Years Nuclear Security Program and is needed to accomplish essential FY 2005 projects to restore, revitalize, and rebuild the nuclear weapons complex. These FY 2005 projects and activities will be in accordance with the Ten Year Comprehensive Site Plans and support NNSA's corporate goal to stabilize NNSA's deferred maintenance by the end of FY 2005	+ 40,198
▪ **Construction –** Increase supports the initiation of several new Project Engineering and Design construction projects that meet the criteria for funding within the Recapitalization subprogram, and supports follow-on funding for a project under the Project Engineering and Design for FY 2004. This increase also supports commencement of utility line item construction activities that will result in significant reductions in NNSA's deferred maintenance	+ 20,984
Total Funding Change, Recapitalization	+ 61,182
Facility Disposition	
▪ Level funding in FY 2005, since the overriding focus of FIRP is deferred maintenance reduction. Supports Congressional requirements for excess facilities elimination and continues activities to reduce the footprint of the nuclear weapons complex	0
Infrastructure Planning	
▪ Increase in Infrastructure Planning supports the continuation of credible, up-front planning and baselining of additional Recapitalization projects. These planning activities will ensure the effective and efficient use of FIRP funds	+ 16,287
Total Funding Change, Facilities and Infrastructure Recapitalization Program	**+ 77,469**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses [b]

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects..........................	98,961	109,055	150,282	+ 41,227	+ 37.8%
Capital Equipment	11,821	13,027	19,602	+ 6,575	+ 50.5%
Total, Capital Operating Expenses	110,782	122,082	169,884	+ 47,802	+ 39.2%

[b] Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment and general plant projects. FY 2004 and FY 2005 funding shown reflects estimates based on FY 2003.

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Appro-priations	FY 2003	FY 2004	FY 2005	Unappropriated Balance
05-D-160, Facilities and Infrastructure Recapitalization Program Project Engineering and Design, VL................	14,700 [a]	0	0	0	8,700	6,000
05-D-601, Compressed Air Upgrades Project, Y-12	14,141 [b]	0	0	0	4,400	9,741
05-D-602, Power Grid Infrastructure Upgrade, LANL	18,500 [b]	0	0	0	10,000	8,500
05-D-603, New Master Substation, Technical Areas I and IV, SNL	7,500 [b]	0	0	0	600	6,900
04-D-203, Facilities and Infrastructure Recapitalization Program Project Engineering and Design, VL................	4,678 [c]	0	0	3,697	981	0
Total, Construction	59,519	0	0	3,697	24,681	31,141

[a] The TEC estimate is for design only for the PED projects included in 05-D-161.

[b] These represent construction TEC estimates. Design TEC estimates are reported in the appropriate PED project.

[c] The TEC estimate is for design only for the PED projects included in 04-D-203. The TEC was reduced for subproject 04-02, Compressed Air Upgrades Project, Y-12 from $6,421,000 to $4,678,000.

Major Items of Equipment *(TEC $2 million or greater)*

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Appro-priations	FY 2003	FY 2004	FY 2005	Acceptance Date
Upgrade 9251 Primary Mill Motor Generator set, Y-12	2,450	0	0	0	0	CANCELED

05-D-160, National Nuclear Security Administration
Facilities and Infrastructure Recapitalization Program (FIRP)
Project Engineering and Design (PED),
Various Locations

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2005 Budget Request *(A-E and technical design only)*…………………	1Q 2005	1Q 2007	3Q 2006	4Q 2011	14,700

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2005	8,700	8,700	6,500
2006	6,000	6,000	7,200
2007	0	0	1,000

3. Project Description, Justification and Scope

This project provides for Architect-Engineering (A-E) services (Title I and Title II) for Facilities and Infrastructure Recapitalization Program (FIRP) construction projects, allowing designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II). The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

The FY 2005 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of Title I

[a] The TEC estimate is for design only for the subprojects currently included in this data sheet.

and II design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the Total Estimated Cost (including physical construction) of each subproject.

FY 2005 Proposed Design Projects

05-01: TA I Heating System Modernization, SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2005	3Q 2006	2Q 2007	4Q 2011	6,000	60,000

Fiscal Year	Appropriations	Obligations	Costs
2005	3,000	3,000	3,000
2006	3,000	3,000	3,000

This project provides and enables Architect-Engineering (A-E) services required to develop and complete preliminary and final (Title I and Title II) design for the proposed Sandia National Laboratories Tech Area I Heating System Modernization. Through this design effort, the Heating System Modernization feasibility will be validated in detail design drawings and specifications. Detailed estimates of construction costs based on the approved design will be developed and working drawings, specifications, and construction schedules, including procurements, will be completed. The products of this design effort will be sufficiently complete and of such sufficient quality to enable procurement of long-lead items and construction to be initiated in fiscal year 2007 when construction funding is received. Construction funding for this project will be separately requested after completion of preliminary (Title I) design work.

Space heating, domestic water heating, and process heating requirements at Sandia National Laboratories (SNL) Area 1 are presently served from SNL's Central Steam Plant and steam distribution system. The ability to supply heating energy to the buildings within Tech Area 1 is critical to SNL's successful operation to meet the laboratory's mission. Tech Area 1 is home to a substantial portion of SNL's work force and therefore, any disruption in steam heating system service has significant ramifications to ongoing critical SNL missions.

The Steam Plant and portions of the distribution system are more than 50 years old. Significant capital upgrades are necessary over the next several years to ensure continued reliable service and to achieve desired reductions in deferred maintenance. Alternative courses of action have been identified and a recommended alternative will be extensively explored in a Conceptual Design Report (CDR), in support of a Request for Critical Decision One (CD-1), scheduled for submission early in FY05. An Energy Systems Acquisition Advisory Board (ESAAB) review will be performed in preparation for CD-1, as required.

Preconceptual planning estimates indicate that this utility line item project is likely to result in a $14 to $37 million reduction in deferred maintenance. Actual values will be determined later in the project lifecycle. This sizable decrease clearly demonstrates alignment with the Facilities and Infrastructure Recapitalization program overriding criteria to reduce deferred maintenance.

Through the design efforts covered by this data sheet, the TA I Heating System Modernization project feasibility will be validated in detail design drawings and specifications. Detailed estimates of construction costs based on the selected design will be developed, and working drawings, specifications, and construction schedules, including procurements, will be completed. Construction funding for the TA I Heating System Modernization project will be requested separately after completion of preliminary (Title I) design work.

05-02: Steam Plant Life Extension Project, Y-12

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
3Q 2005	1Q 2007	1Q 2007	4Q 2009	6,000	32,300-44,700

Fiscal Year	Appropriations	Obligations	Costs
2005	3,000	3,000	2,000
2006	3,000	3,000	3,500
2007			500

The proposed project includes the repair and/or replacement of existing boiler and auxiliary systems and components. Major scope elements include the following: Boiler systems, coal receiving and handling system, forced-draft system, induced-draft system, feed water system, wet ash system, dry ash system, steam Plant Waste Water Treatment Facility, steam plant control room, steam plant facility (electrical), and steam plant facility (structural).

This subproject provides for preliminary and final (Title I and Title II) design for the proposed Steam Plant Life Extension Project (SPLEP) at the Y-12 National Security Complex. The project will upgrade, modify and/or replace components and systems of the steam generating facility to correct deficiencies related to capacity, physical condition, efficiency, reliability, operations, maintenance and compliance.

A robust and reliable source of steam is critical to protect Y-12's production and storage capabilities in support of the Defense Programs Stockpile Stewardship mission and other programmatic missions. The existing steam generation system has many deficiencies, which jeopardize Y-12's ability to reliably meet its mission.
The Y-12 steam plant was built in 1954 and consists of four boilers, each rated at 200,000 lbs/hour at 235 psig and 500 ^{0}F. The boilers are capable of being fueled with either coal or natural gas. Auxiliary systems including feed water, coal handling, combustion air, flue gas, ash handling, and the associated utilities, electrical and instrumentation systems are provided to support plant operation.

Much of the existing equipment has deteriorated and is at the end of its useful life. A significant amount of the instrumentation is antiquated, inoperable, or unreliable. The systems are inefficient and unreliable due to their age and the state of disrepair. Maintenance is difficult and expensive due to the age, condition of the equipment and difficulty in acquiring spare parts.

Completion of this project will eliminate approximately $25,000,000 in deferred maintenance costs associated with the steam plant facility at Y-12.

05-03: Electrical Distribution System Upgrade (EDSU), Pantex

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2005	4Q 2006	4Q 2006	3Q 2008	1,600	9,630 – 13,380

Fiscal Year	Appropriations	Obligations	Costs
2005	1,600	1,600	900
2006	0	0	400
2007	0	0	300

The Electrical Distribution System Upgrade project has been identified as a high priority project in the 2004 Pantex Plant Ten Year Comprehensive Site Plan (TYCSP). A key element of the site infrastructure is the electrical power distribution system. This project addresses three areas of the electrical distribution system that are of questionable reliability due to code non compliance, aging and/or unavailability of spare parts. Specifically the three areas are as follows:

1. Ground Fault and Surge Arrestor Upgrade (GFSAU).

   A short circuit/coordination study of the Pantex Plant's 12470, 480, and 208-volt distribution systems completed in 1994 identified substations and equipment that had ground fault/coordination deficiencies in violation of the National Electrical Code. These codes were adopted subsequent to Pantex electrical distribution equipment being installed and require substations and distribution equipment be protected from ground faults and line surges. The project design brings 11 substations (and any additionally identified substations) into compliance with the National Electrical Code.

2. Overhead Electrical Power Line Replacement.

   The existing overhead primary pole and underground secondary lines are in many cases over 30 years old, and lines are deteriorating to the point that a major fault or weather incident could destroy lines, critical facilities, systems and equipment, potentially causing major outage to the Plant or unacceptable portions thereof. It is estimated that 14 miles of overhead lines and 1 mile of underground line need to be replaced. Over the past 18 months 12 poles have failed and had to be replaced. The rate of replacement is expected to increase as the system continues to age.

3. Facility Standby Diesel Generator Upgrade (FSDGU).

   This subproject will replace approximately16 facility generators that have operational and maintenance problems due to their age, obsolescence and difficulty in obtaining parts as this equipment ages. Problems will become more frequent and more likely to affect the ability of Pantex to meet mission requirements. Facilities utilizing these generators have been deemed critical or mission essential to the Plant's operations. These facilities will continue to experience operational and maintenance problems with the possibility of facility shut down until reliable generators are installed. Approximately seven (7) building locations require Uninterruptible Power Supplies (UPS) replacement or upgrade due to the age and obsolescence of the existing UPS. The cost of maintaining the UPSs has averaged over $250,000 per year over the past four years (1999-2002). As the UPSs reach their normal life expectancy these costs will continue in increase.

The total maintenance costs associated with the electrical distribution system has continued to rise from $290,000 in FY96 to over $590,000 in FY02. This trend is expected to continue as the equipment and facilities age. The anticipated deferred maintenance reduction associated with this project is $2,600,000.

05-04: Gas Main and Distribution System Upgrade (GMDSU), Pantex

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2005	3Q 2006	3Q 2006	4Q 2007	1,100	3,770-5,970

Fiscal Year	Appropriations	Obligations	Costs
2005	1,100	1,100	600
2006	0	0	300
2007	0	0	200

Reliable gas service is required for Pantex operations. The Gas Main and Distribution System Upgrade project has been identified as a high priority project in the 2004 Pantex Ten Year Comprehensive Site Plan (TYCSP). The existing gas distribution system was installed in the 1940s. The distribution system consists of approximately 49 thousand feet of schedule 40 carbon steel pipe and 23 thousand feet of high-density polyethylene pipe in diameters ranging from ½” to 12”. This project addresses those areas of the gas main and distribution system that are of questionable reliability due to aging and use of old technologies. Specific areas of concern are as follows:

1. Pipe Line Replacement
   Failure in the gas main and distribution lines are occurring in the ductile iron pipe sections that were installed in 1940s. This project will replace steel / metal pipelines with high-density polyethylene plastic pipe.

2. Upgrade of Appurtenances
   Instrumentation required to regulate and meter the natural gas flow from the supplier will be upgraded with the latest technological devices. The installation of two Motor Operated Isolation Valves (MOIV) and remote operation capability will allow for the isolation of the gas main at the point of Government ownership and at the Pantex Plant boundary. This will provide quick shutdown capability should an incident occur that requires gas isolation.

3. Cathodic Protection Installation
   Sacrificial anodes for the valves and connection rings will provide cathodic protection for the new pipeline. The existing deep well anode beds associated with the existing metal pipeline will be abandoned in-place.

The Pantex Plant is a critical resource in the NNSA nuclear weapons mission. The Gas Main and Distribution System Upgrade is a Facilities and Infrastructure Recapitalization Project (FIRP) Line Item project designed to extend the life of the gas distribution system, reduce operational impacts, and reduce maintenance. The anticipated deferred maintenance reduction associated with this Project is $3,100,000.

4. Details of Cost Estimate [a]

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase [b]		
Preliminary and Final Design costs (Design Drawings and Specifications)	12,495	N/A
Design Management costs (10% of TEC)	1,470	N/A
Project Management costs (5% of TEC)	735	N/A
Total, Design Costs (100% of TEC)	14,700	N/A
Total, Line Item Costs (TEC, Design Only)	14,700	N/A

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Project Engineering and Design	0	0	0	6,500	8,200	14,700
Total, Line Item TEC	0	0	0	6,500	8,200	14,700
Total, Facility Costs (Federal and Non-Federal)	0	0	0	6,500	8,200	14,700
Other Project Costs						
Conceptual design costs	0	213	2,900	0	0	3,113
NEPA						
Other project-related costs	0	500	482	803	3,290	5,075
Total, Other Project Costs	0	713	3,382	803	3,290	8,188
Total Project Costs	0	713	3,382	7,303	11,490	22,888

[a] This cost estimate is based upon direct field inspection and historical cost estimate data, coupled with parametric cost data and completed conceptual studies and designs, when available. The cost estimate includes design phase activities only. Construction activities will be requested as individual line items upon completion of Title I design.

[b] The percentages for Design Management; Project Management; and Design Phase Contingency are estimates based on historical records and are preliminary estimates.

05-D-601, Compressed Air Upgrades Project
Y-12 National Security Complex, Oak Ridge, Tennessee

This project is still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at the completion of the preliminary design (Critical Decision 2).

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2005 Budget Request *(Preliminary Estimate)*	1Q 2004	3Q 2005	2Q 2005	4Q 2006	18,141	21,205

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design [a]			
2004	3,019	3,019	1,353
2005	981	981	2,647
Construction			
2005	4,400	4,400	4,400
2006	9,741	9,741	9,441
2007	0	0	300

[a] The TEC includes the cost of preliminary and final design ($4,000,000) which was appropriated in 04-D-203, Project Engineering and Design (PED), Various Locations.

[a] Design funding was appropriated in 04-D-203, Project Engineering and Design (PED), Various Locations.

3. Project Description, Justification, and Scope

Project Description

This project provides funding for the construction of the Compressed Air Upgrades Project (CAUP). Project Engineering and Design funding under line 04-D-203 was provided for Architect-Engineering (A-E) services to develop and complete preliminary and final (Title I and Title II) design of CAUP. The design effort will be completed during FY 2005.

The objective of this project is to rehabilitate the existing compressed air capability at the Y-12 National Security Complex (NSC) to maintain a reliable, cost-efficient compressed air capability for the current and future buildings and facilities at the Y-12 NSC that will in turn ensure continued operation of Y-12's production facilities.

Justification

The Y-12 NSC requires a robust and reliable source of compressed air to accomplish its production and storage missions. Critical functions of the compressed air system include the following:

- pneumatic control of production and manufacturing processes,
- pneumatic control of heating, ventilating, and air conditioning systems,
- cooling applications in selected manufacturing processes,
- operation of pneumatic pumps, valves, and air lift circulators,
- supporting the operation of air bearings, and
- mixing and sparging of storage tanks

The loss of these capabilities jeopardizes Y-12's ability to meet its mission.

Y-12 currently must rehabilitate the existing compressed air capability to maintain a reliable, cost-efficient compressed air capability that will in turn ensure continued operation of Y-12’s production facilities. The existing compressed air system at Y-12 is unreliable and inefficient to operate due to the age and physical condition of the equipment and facilities, distributed design of facilities, and the lack of an integrated control system to manage the operation of the systems. A significant amount of corrective maintenance is required to maintain operations. Outages involving the loss or reduction of system pressures below the allowable minimums occur on average every two weeks. These pressure excursions require that non-essential uses of compressed air be curtailed until equipment can be brought back on-line. The average duration of an instrument air outage is 30 minutes.

Completion of this project will eliminate approximately $16,400,000 in deferred maintenance costs associated with the compressed air facilities at Y-12.

Without the project, Y-12’s compressed air capability is at risk of failure, which can adversely impact Y-12’s missions by disrupting service and increasing cost.

Scope

The CAUP will provide four new compressed air trains to be installed in Building 9767-13. The new trains will consist of compressors, air dryers, receivers and associated filters, heat exchangers, and interconnecting piping. An integrated control system will be provided for local operation. The control system will be connected to the existing Y-12 Utility Management System for monitoring and remote control. Supporting utilities will include electrical power, cooling water, and brine. These utilities will be supplied from existing systems which serve Building 9767-13.

The air will be delivered from the new compressor trains to users via the existing distribution systems.

Some building upgrades are required to meet this project's required design life. Existing ventilation systems will be replaced by this project. A new roof will be put on the building and a new roof access system will be provided to enhance maintenance access. Cooling tower 9409-13 will also be upgraded; new pumps and control valves and a new sprinkler system will be provided to increase operability and extend design life. Facilities that become surplus because of the project will be placed in safe shutdown and transferred to the Infrastructure Reduction Program for disposition.

Project Milestones:

FY 2004:	Initiate AE Work	1Q
FY 2005	Complete AE Work	3Q
	Initiate Physical Construction	2Q
FY 2006	Complete Physical Construction	4Q

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase (17.6% of TEC) [a]	3,200	N/A
Construction Phase		
Special Facilities	7,775	N/A
Building Modifications	500	N/A
Construction Support (4.9% of TEC)	888	N/A
Project Management (11.9% of TEC)	2,150	N/A
Total, Construction Costs (62.4% of TEC)	11,313	N/A
Contingencies		
Design Phase (4.4% of TEC)	800	N/A
Construction Phase (15.6% of TEC)	2,828	N/A
Total, Contingencies (20.0% of TEC)	3,628	N/A
Total, Line Item Costs (TEC) [b]	18,141	N/A

5. Method of Performance

Overall project direction and responsibility for this project resides with the NNSA. NNSA has assigned day-to-day management of project activities to the Y-12 management and operating (M&O) contractor, BWXT Y-12, including design, procurement, construction, and commissioning.

The M&O contractor will perform preliminary design. To the extent practical, final design and major procurement will be performed by an engineering/procurement (E/P) subcontractor awarded on the basis of the best value to the government. Construction will be performed to the extent practical using subcontracts that are awarded based on fixed-price competitive bidding.

[a] Design funding was appropriated in 04-D-203, Project Engineering and Design.

[b] This is a preliminary estimate. The Performance Baseline will be established following completion of preliminary design and approval of Critical Decision 2.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Design	0	0	1,353	2,647	0	4,000
Construction	0	0	0	4,400	9,741	14,141
Total, Line item TEC [a]	0	0	1,353	7,047	9,741	18,141
Total, Facility Costs (Federal and Non-Federal)	0	0	1,353	7,047	9,741	18,141
Other Project Costs						
Conceptual design cost [b]	0	1,070	0	0	0	1,070
Other project-related costs [c]	0	0	316	332	1,346	1,994
Total, Other Project Costs	0	1,070	316	332	1,346	3,064
Total, Project Cost (TPC)	0	1,070	1,669	7,379	11,087	21,205

7. Related Annual Funding Requirements

(FY 2007 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs [d]	445	N/A
Annual utility costs (estimated based on FY 2003 rate structure)	1,224	N/A
Total related annual funding (operating from FY 2007 through FY 2027)	1,669	N/A

[a] The TEC includes the cost of preliminary and final design, which was appropriated in 04-D-203, Project Engineering and Design.

[b] The Conceptual design costs include costs for completion of the Critical Decision 1 package and related documentation (project execution plan, conceptual design report, acquisition strategy, NEPA evaluation, ES&H plan, QA plan, etc.) in June 2003.

[c] Other project related costs include plant support to the project and commissioning/startup activities (development of plans and procedures, commissioning, startup, etc.).

[d] The annual facility operating costs includes annual maintenance and repair costs.

05-D-602, Power Grid Infrastructure Upgrade (PGIU), Los Alamos National Laboratory, Los Alamos, New Mexico

This project is design build. As a result, the cost and schedule are preliminary estimates and are subject to change once the Performance Baseline is approved by the Acquisition Executive at Critical Decision 2.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2005 Budget Request *(Preliminary Estimate)*	see note[a]	see note[a]	3Q 2005	4Q 2007	18,500	20,000

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
2005	10,000	10,000	10,000
2006	8,500	8,500	7,500
2007	0	0	1,000

3. Project Description, Justification and Scope

Project Description

The Laboratory is connected to the northern New Mexico power grid by two 115kV lines. The lines terminate at a single point at the Eastern Technical Area (ETA) substation on Laboratory property. The Laboratory and DOE have been aware for years that this existing electrical service of two 115kV lines with one common power delivery point represents a single point of failure. The Cerro Grande fire caused a single point failure in the system leaving the Laboratory and Los Alamos County without power during the fire. The fire burned up to the edge of the ETA substation and burned poles of both

[a] This project will be accomplished through a design-build acquisition method, which is standard industry practice for this type of project. Design and construction will proceed in parallel.

incoming lines. Both outside sources of power were lost. In addition, microwave communications with the grid were also lost. Normal practice would require a minimum of three independent sources of power. With this project, a new line would be built and the single point of failure on site would be eliminated.

The proposed action includes construction of an approximately 9-mile 115-kV power transmission line across DOE administered property; and associated terminal facilities. The line would originate at a new Southern Technical Area (STA) Switchyard and proceed northwesterly through the central portion of LANL to the West Technical Area (WTA) Substation. The entire right of way would be constructed using 115kV type structures.

The proposed STA switchyard would be constructed utilizing a 115 kV ring bus & circuit breaker scheme that allows power to be fed either to the WTA or ETA substation. The new STA switchyard would be energized from the Reeves line that currently exists.

This proposed project would also address deferred maintenance items associated with the Eastern Technical Area (ETA) Substation. The equipment associated with the ETA has not been able to receive critical maintenance and repairs due to the inability to de-energize the ETA to perform this maintenance. After completion of this project, the existing Norton line and Reeves line can then be individually de-energized to perform future critical maintenance while allowing LANL to continue normal operations without interruption.

Project Justification

The primary driver for this project is the need to address deferred maintenance issues at the Eastern Technical Area (ETA) substation. The effort from a deferred maintenance stand point will address systems and equipment associated with the ETA and the existing Norton line which have not been able to be maintained due to the fact that power cannot be shut down to perform this maintenance. Many of the items to be replaced as deferred maintenance have surpassed their useful life and many others have been run to failure. This replacement/repair can only be made after the new system comes on line. The deferred maintenance buy down amount will be $7.0M for this effort.

The secondary driver for this project is reliability. In accordance with NERC (North American Electric Reliability Council) and WSCC (Western Systems Coordinating Council) Planning Criteria, critical loads require two physically separate and independent sources of power. This requirement is not currently being complied with for the following reasons:

- The existing two incoming lines to Los Alamos terminate at the same location, the Eastern Technical Area substation. A single event could potentially remove both lines from service.

- The existing two lines cross one another at one location, which creates the potential for total loss through a failure of a structure or conductor of the upper line resulting in the loss of the lower line due to a single event.

- Due to the need for continuing repairs of the structures and conductors on the existing two lines and the substation, there is a potential for total loss of service to LANL should an event such as equipment failure or natural calamities like lightning and fire occur. Even when maintenance is not being performed, total loss of service could occur as has happened in the past due to lightning, fire, and equipment failures. These occurrences are not acceptable in critical nuclear facilities like Los Alamos National Laboratory.

- Standard utility industry reliability planning criteria require the utility organization to be able to serve its entire load with the single largest generation or transmission facility out of service. Currently the two 115kV lines that provide power to the site do not meet this requirement. The proposed high-voltage line would fulfill LANL's obligation for meeting some of the regional bulk utility planning criterion.

- This project would allow LANL to address a number of deferred maintenance items that has been steadily growing due to the inability to de-energize the existing lines and ETA.

- The recent failure of one of the lines due to equipment failure, and the recent action by the San Ildefonso Pueblo to cancel all permits to LANL for maintenance work on the portion of the existing 115 kV Norton line within the Pueblo, makes the Laboratory very vulnerable to total power "black-out".

The power system is vulnerable and reliability is definitely at risk. Failure to provide, as soon as possible, a completely independent source of power in an orderly, planned manner could lead to prolonged outages resulting in negative and unacceptable effects on the programmatic missions of the Laboratory.

Project Scope

The primary objective of the Power Grid Infrastructure Upgrade project is to construct a new STA switchyard, install a new 115kV transmission line from the Southern Technical Area Switchyard to the Western Technical Area Substation and address deferred maintenance issues at the Eastern Technical Area Substation thus eliminating future vulnerabilities to the power supply and distribution systems in Los Alamos. The primary objective will be achieved by providing the following:

- **Transmission System:** The new system will provide structures and transmission lines as required by National Codes and Standards. The structures will be capable of resisting identified threats including Design Basis Accidents (DBA) and Natural Phenomena so that they may perform their function during and after these events. At LANL these events may be earthquakes, wild fires, high winds, terrorist actions, or other events as determined by Vulnerability Analysis and Hazards Assessment.
- **Switchyard:** A Southern Technical Area switchyard will be constructed in a desirable location adjacent to the existing Reeves transmission line. This switchyard will be the new connection point for the Reeves line, this connection will energize the STA switchyard and the new 115kV

transmission line that will terminate at the Western Technical Area substation. This STA switchyard will be constructed utilizing a ring bus & circuit breaker scheme that allows power to be fed either to the WTA or ETA substation.

- **ETA Substation equipment:** This project will include the procurement and installation of substation equipment and transmission line equipment to address deferred maintenance issues that have been ever increasing due to the inability to de-energize the ETA and Norton and Reeves lines for maintenance. This element will be accomplished after the new STA switchyard and new 115kV leg are installed and energized.
- **STA to WTA 115 KV Line:** The 115kV power line route will be selected so that it is in the best possible location accounting for easement, accessibility and affordability. The utility corridor cleared area will be large enough to assure that wildfire cannot threaten the transmission lines, structures or any of its outlying support equipment and structures (security systems, utilities equipment, etc.). Los Alamos is located in mountainous terrain where the climate ranges from high desert to wet alpine forest. The route will be selected to avoid areas of heavy snow cover, potential flash flood areas, high wind zones, weather extreme zones, areas with high lightning strike frequency and non-DOE properties. The site will be selected to avoid the presence of seismic faults where practical. The site selection will also be integrated with the Ten-Year Comprehensive Site Plan.
- **Access**: Utility corridor access roads will be provided where practical for routine maintenance.
- **Security**: Security requirements will be tailored to the particular area of the Laboratory being entered. All work performed on DOE properties will follow site-specific requirements for entry, escorting and prohibited items for the area being entered.

Project Milestones:

FY 2004:	Establish Performance Baseline (Critical Decision 2/3)	4Q
FY 2005:	Initiate Physical Construction	3Q
FY 2007:	Complete Physical Construction	4Q

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase [a]	1,926	N/A
Construction Phase		
Improvements to Land	658	N/A
Standard Equipment	11,930	N/A
Inspection, design and project liaison, testing, checkout, and acceptance	163	N/A
Construction Management	207	N/A
Project Management (3.9% of TEC)	729	N/A
Total, Construction Costs (73.9% of TEC)	13,687	N/A
Contingencies		
Construction Phase	2,887	N/A
Total, Contingencies (15.6% of TEC)	2,887	N/A
Total, Line Item Costs (TEC)	18,500	N/A

5. Method of Performance

Design and construction will be accomplished through a combination of competitively awarded and existing contracts, using fixed price and cost reimbursable pricing methods. The design effort is relatively simple and the construction scope is straightforward. Due to this, design-build is being planned as the execution approach at this conceptual stage and the preliminary estimate assumes this approach. The acquisition and execution approach will be specifically defined during the conceptual design phase.

[a] This project will be executed with a design-build acquisition strategy.

6. Schedule of Project Funding [a]

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design……………………………..	0	0	0	1,926	0	1,926
Construction………………………..	0	0	0	8,074	8,500	16,574
Total, Line Item TEC	0	0	0	10,000	8,500	18,500
Other Project Costs						
Conceptual Design Cost …………..	0	0	0	0		0
NEPA………………………………..	0	0	0	0	0	0
Other Project-Related Costs[b] …….	0	1,000	250	0	250	1,500
Total, Other Project Costs……………..	0	1,000	250	0	250	1,500
Total Project Cost (TPC) …………….	0	1,000	250	10,000	8,750	20,000

7. Related Annual Funding Requirements

(dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs..……………………… ……………………………	50	N/A
Annual facility maintenance and repair costs ……………………………………	100	N/A
Total related annual funding ………………………………………………………	150	N/A
Total operating costs (operating FY2006 through FY2026)[c] …………………….	3,000	N/A

[a] The baseline for this project will be established at CD-2 based on the selected contractor's fixed-price proposal.

[b] Project Management, Quality Assurance, LIR Implementation, Project Execution Plan, Siting Studies, Estimating Support, Scheduling and Controls Support, Safeguards and Security Analysis, Design-Build Procurement, Source Selection work, Value Engineering Study, Fire Hazards Assessment, Permits, Administrative Support, Operations and Maintenance Support, Operating Manuals & Procedures, Operations Testing, and Readiness Assessment.

[c] More precise operating costs will be established during conceptual design.

05-D-603, New Master Substation, Technical Areas I and IV
Sandia National Laboratories, Albuquerque, New Mexico

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request *(Preliminary Estimate)….*	2Q 2004	4Q 2005	2Q 2006	2Q 2008	700	5,200–7,500
FY 2005 Budget Request *(Preliminary Estimate)….*	2Q 2004	4Q 2005	2Q 2006	2Q 2008	8,200	8,750

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2004	700 [a]	700	700
Construction			
2005	600 [b]	600	600
2006	6,900	6,900	6,600
2007	0	0	300

[a] The design for this project was appropriated and accomplished in 04-D-203, National Nuclear Security Administration, Facilities and Infrastructure Recapitilization Program (FIRP), Project Engineering and Design (PED), Various Locations.

[b] Funding will be used for long-lead procurement of main transformer component to insure the project is completed within budget and in accordance with the schedule.

3. Project Description, Justification, and Scope

This project has previously been authorized to procure the Architect-Engineering (A-E) services required to develop and complete preliminary and final (Title I and Title II) design for the new Sandia National Laboratories New Master Substation Utility for Technical Areas I and IV. Through this design effort, the New Master Substation feasibility will be validated in detail, design drawings, and specifications. Detailed estimates of construction costs based on the approved design will be developed, and working drawings, specifications, and construction schedules, including identification of long lead procurements, will be completed.

The New Master Substation design would be similar to Substation 41, which was constructed in 1998 and incorporates the design basis features for Sandia's standardized master substations. Standardized substations allow for using components/sub-systems that have proven operating efficiency and reliability, ease of maintenance, personnel and system safety features, and result in lower spare parts inventory. The new 12.47 kilovolt underground distribution feeder cables would connect the New Master Substation to the existing normal service master substations (Subs 35, 36, 37, & 41) in the Technical Area I-IV campus in a radial/loop configuration. This configuration allows for any one master substation to be shutdown for any operating or maintenance necessity (i.e. emergency, corrective, or preventive maintenance) by transferring building substations from one master substation to another. These transfers are usually performed without interruption of service to buildings.

The New Master Substation will be designed to address the following objectives:

- Provide sufficient main power transformer and distribution feeder capacity/configuration to meet planned electrical loads in the Technical Area I-IV campus as shown in the FY03 TYCSP.
- Provide additional 12.47 kilovolt radial/loop feeders to supplement the single radial/loop feeder serving Technical Area IV.
- Remove Substation 38, which presently supplies standby service to Technical Area IV.
- Continue to operate safely and in accordance with regulatory, environmental, and health policies.

Critical Decision One (CD-1), Approve Alternative Selection and Cost Range, was approved October 9, 2003.

The New Master Substation Utility for Technical Areas I and IV at Sandia National Laboratories in Albuquerque, New Mexico (SNL/NM) is needed to meet funded and future planned facilities shown in the FY03 TYCSP. These facilities include Line Item and General Plant Projects such as JCEL, MESA, CINT, SARC, MERC, Computing District Central Utility Building, Scientific Computing Facility, INSRC, and several IGPPs. These individual projects do not have sufficient funds to construct the New Master Substation. Additionally, since the New Master Substation and associated distribution feeders support Sandia's strategic objectives, which transcend multiple DOE/NNSA/Other Federal Agency programs, it would not be equitable to burden any one specific project/program with its cost.

A significant risk to project schedule and cost was identified during the Conceptual Design Report (CDR) phase for the procurement, and fabrication of the main transformer component for the Master Substation. To mitigate the risk, long lead procurement of the main transformer is scheduled for 3Q 2005 for an estimated cost of $600,000. This long lead procurement strategy will ensure that the Main Transformer could be purchased and delivered to the site in concert with the beginning of the construction work. The construction work is set to start in FY06.

This project directly supports the recommendation of the December 2001 Nuclear Posture Review to revitalize the defense infrastructure to increase confidence in the deployed forces, eliminate unneeded weapons, and mitigate the risks of technological surprise. It directly contributes to the DOE Strategic Plan's Defense Strategic Goal: To protect our national security by applying advanced science and nuclear technology to the Nation's defense. It also supports achievement of DOE General Goal 1 of Nuclear Weapons Stewardship: Ensure our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security and reliability of the U.S. nuclear weapons stockpile. This project would directly contribute to the safety and reliability of one of the nation's most sensitive nuclear weapons sites.

Project Milestones:

FY 2004:	Initiate AE Work	2Q
FY 2005	Complete AE Work	4Q
	Long Lead Procurement	3Q
FY 2006	Initiate Physical Construction	2Q
FY 2008	Complete Physical Construction	2Q

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase [a]		
Preliminary and Final Design Costs	480	N/A
Design Management Costs (1.7% of TEC)	140	N/A
Project Management Costs (1.0% of TEC)	80	N/A
Total, Engineering Design, Inspection, and Administration of Construction Costs (8.5% of TEC)	700	N/A
Construction Phase		
Utilities [b]	6,700	N/A
Construction Management (3.6% of TEC)	300	N/A
Project Management (6.1% of TEC)	500	N/A
Total, Construction Costs (91.4% of TEC)	7,500	N/A
Contingencies		
Design Phase (0.9% of TEC)	80	N/A
Execution Phase (7.6% of TEC)	620	N/A
Total, Contingencies (8.5% of TEC)	700	N/A
Total, Line Item Cost	8,200	N/A
Total, Line Item Costs (TEC)	8,200	N/A

5. Method of Performance

Design of this project will be by the operating contractor or a subcontractor as appropriate. To the extent feasible, construction and procurement will be accomplished by fixed-priced contracts awarded on the basis of competitive bids.

[a] The design for this project was appropriated and accomplished in 04-D-203, National Nuclear Security Administration, Facilities and Infrastructure Recapitilization Program (FIRP), Project Engineering and Design (PED), Various Locations.

[b] This includes the $600,000 long lead procurement of the main transformer.

6. Schedule of Project Funding

	Prior Years	FY 2004	FY 2005	Outyears	Total
Project Cost					
Facility Cost					
Design	0	700	0	0	700
Construction	0	0	600	6,900	7,500
Total, Line item TEC [a]	0	700	600	6,900	8,200
Total, Facility Costs (Federal and Non-Federal)	0	700	600	6,900	8,200
Other Project Costs					
Conceptual design cost [b]	300	0	0	0	300
Other project-related costs [c]	18	81	82	69	250
Total, Other Project Costs	318	81	82	69	550
Total, Project Cost (TPC)	318	781	682	6,969	8,750

7. Related Annual Funding Requirements

(FY 2007 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs	TBD	N/A
Annual utility costs (estimated based on FY 2003 rate structure)	TBD	N/A
Total related annual funding (operating from FY 2007 through FY 2027)	TBD	N/A

[a] The TEC includes the cost of preliminary and final design, which was appropriated in 04-D-203, Project Engineering and Design.
[b] The Conceptual design costs include costs for completion of the Critical Decision 1 package and related documentation (project execution plan, conceptual design report, acquisition strategy, NEPA evaluation, ES&H plan, QA plan, etc.) in June 2003.
[c] Other project related costs include plant support to the project and commissioning/startup activities (development of plans and procedures, commissioning, startup, etc.).

04-D-203, National Nuclear Security Administration
Facilities and Infrastructure Recapitalization Program (FIRP)
Project Engineering and Design (PED),
Various Locations

Significant Changes

- The TEC for Project Engineering and Design (PED) of the Compressed Air Upgrades Project, Y12 is decreased by $ 1,721,000 to $4,700,000 with deletion of the Breathing Air System from the scope of this project.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000) [a]
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2004 Budget Request *(A-E and technical design only)……………………*	1Q 2003	4Q 2006	1Q 2006	1Q 2008	6,421
FY 2005 Budget Request *(A-E and technical design only)……………………*	1Q 2004[b]	4Q 2005	2Q 2005	2Q 2008	4,700

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2004	3,719[c]	3,719	2,053
2005	981	981	2,647

3. Project Description, Justification and Scope

This project provides for Architect-Engineering (A-E) services (Title I and Title II) for Facilities and Infrastructure Recapitalization Program (FIRP) construction projects, allowing designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II). The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and

[a] The TEC estimate is for design only for the subprojects currently included in this data sheet.

[b] Correction, this should have been 2004.

[c] The FY 2004 appropriated amount has not been adjusted to the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

The FY 2004 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of Title I and II design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the Total Estimated Cost (including physical construction) of each subproject.

FY 2004 Proposed Design Projects

04-01: New Master Substation, Technical Area I and IV, SNL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2004	4Q 2005	2Q 2006	2Q 2008	700	6,900-8,200

Fiscal Year	Appropriations	Obligations	Costs
2004	700	700	700

This subproject provides and enables Architect-Engineering (A-E) services required to develop and complete preliminary and final (Title I and Title II) design for the proposed New Master Substation for Technical Areas I and IV at Sandia National Laboratories. Through this design effort, the New Master Substation feasibility will be validated in detail, design drawings, and specifications. Detailed estimates of construction costs based on the approved design will be developed, and working drawings, specifications, and construction schedules, including procurements, will be completed. The products of this design effort will be sufficiently complete and of such quality to enable long-lead procurement items to be procured and construction to be initiated in FY 2006 when construction funding is received. Construction funding for this project will be separately requested after completion of preliminary (Title I) design work.

The New Master Substation will be designed to address the following objectives:

- Provide sufficient main power transformer and distribution feeder capacity/configuration to meet planned electrical loads in the Technical Area I-IV campus as shown in the FY 2004 TYCSP.
- Provide additional 12.47 kilovolt radial/loop feeders to supplement the single radial/loop feeder serving Technical Area IV.
- Remove Substation 38, which presently supplies standby service to Technical Area IV.
- Continue to operate safely and in accordance with regulatory, environmental, and health policies.

The New Master Substation is an infrastructure facility consisting of a 115 kilovolt transmission section, 12/16/20 MVA main power transformer, 12.47 kilovolt/1200 ampere rated distribution switchgear section, 3600 kVAR power factor correction capacitor bank, station service equipment, control house with protective relaying and alarming systems, direct current supply system, and walled substation yard (~250x300 feet) to prevent unauthorized access. In addition, 12.47 kilovolt underground distribution feeder cables would be installed to connect the New Master Substation to the existing 12.47-kilovolt underground distribution grid that serves Sandia's buildings/facilities between Technical Areas I and IV.

04-02: Compressed Air Upgrades Project, Y-12

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2004	3Q 2005	2Q 2005	4Q 2006	4,000	18,141

Fiscal Year	Appropriations	Obligations	Costs
2004	3,019	3,019	1,353
2005	981[a]	981	2,647

This subproject provides and enables Architect-Engineering (A-E) services required to develop and complete preliminary and final (Title I and Title II) design for the proposed Compressed Air Upgrades Project at the Y-12 National Security Complex. The project will upgrade, modify and/or replace the compressed air production capability to correct deficiencies related to capacity, physical condition, efficiency, reliability, operations, maintenance and compliance.

The Y-12 Complex is served by compressed air systems housed in facilities located across the complex. The systems supply compressed air to the complex via three complex-wide piping distribution systems.

A robust and reliable source of compressed air is essential to protect Y-12's production and storage capabilities in support of the Defense Programs Stockpile Stewardship mission and other programmatic missions. The existing compressed air system has many deficiencies, which jeopardize Y-12's ability to reliably meet its mission. Much of the existing compressor and associated drying equipment has deteriorated and is at the end of its useful life. Significant amounts of the instrumentation are antiquated, inoperable, or unreliable. The systems are inefficient and unreliable due to their age, the state of disrepair and the less than optimum configuration of the systems for the current and future production footprints. Some systems are located in facilities, which are dilapidated and subject to flooding. Maintenance is difficult and expensive due to the age and condition of the equipment.

Completion of this project will eliminate approximately $16,400,000 in deferred maintenance costs associated with the compressed air facilities at Y-12.

[a] The FY05 Appropriation and Obligation is decreased by $1,721,000 to $981,000 with deletion of the Breathing Air System from the scope of this project.

4. Details of Cost Estimate[a]

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase[b]		
Preliminary and Final Design costs (Design Drawings and Specifications	3,995	5,273
Design Management costs (10% of TEC)	470	487
Project Management costs (5% of TEC)	235	661
Total, Design Costs (100% of TEC)	4,700	6,421
Total, Line Item Costs (TEC, Design Only)	4,700	6,421

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Cost						
Facility Cost						
Project Engineering and Design	0	0	2,053	2,647	0	4,700
Total, Line Item TEC	0	0	2,053	2,647	0	4,700
Total, Facility Costs (Federal and Non-Federal)	0	0	2,053	2,647	0	4,700
Other Project Costs						
Conceptual design costs	0	1,450	0	0	0	1,450
NEPA						
Other project-related costs	0	150	316	532	1,116	2,114
Total, Other Project Costs	0	1,600	316	532	1,116	3,564
Total Project Costs	0	1,600	2,369	3,179	1,116	8,264

[a] This cost estimate is based upon direct field inspection and historical cost estimate data, coupled with parametric cost data and completed conceptual studies and designs, when available. The cost estimate includes design phase activities only. Construction activities will be requested as individual line items upon completion of Title I design.

[b] The percentages for Design Management; Project Management; and Design Phase Contingency are estimates base on historical records and are preliminary estimates.

Safeguards and Security

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Safeguards and Security					
Operations & Maintenance					
Physical Security............................	480,320	499,069	589,491	+ 90,422	+ 18.1%
Cyber Security................................	69,200	79,740	80,500	+ 760	+ 1.0%
Total, Operations & Maintenance................................	549,520	578,809	669,991	+ 91,182	+ 15.8%
Construction...................................	8,641	3,661	37,000	+ 33,339	+ 910.7%
Total, Safeguards and Security..	558,161	582,470	706,991	+ 124,521	+ 21.4%
Offset for S&S Work for Others.......	-28,985	-28,985	-30,000	- 1,015	- 3.5%
Total, Safeguards and Security with Offset.....................................	529,176	553,485	676,991	+ 123,506	+ 22.3%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Safeguards and Security						
Physical Security...............	589,491	498,000	497,263	496,653	507,434	2,588,841
Cyber Security...................	80,500	66,071	73,021	68,637	70,464	358,693
Construction......................	37,000	43,000	48,400	48,400	48,400	225,200
Subtotal, Safeguards and Security.....................	706,991	607,071	618,684	613,690	626,298	3,172,734
Offset, for S&S Work for Others..........................	-30,000	-32,000	-33,000	-34,000	-35,000	-164,000
Total, Safeguards and Security with Offset...........	676,991	575,071	585,684	579,690	591,298	3,008,734

Description

This program will protect National Nuclear Security Administration (NNSA) personnel, facilities, nuclear weapons, and information from terrorists and other post September 11th threats in a cost-effective manner.

Benefits to Program Goal 01.39.00.00 Safeguards and Security

Within the Safeguards and Security program, the Physical Security and Cyber Security subprograms each make unique contributions to Program Goal 01.39.00.00. Physical Security constitutes the largest funding allocation of the NNSA security effort and includes (1) Protective Forces – a site's primary front-line protection, consisting of armed and unarmed uniformed officers; (2) Physical Security Systems – provide intrusion detection and assessment barriers, access controls, tamper protection monitoring, and performance testing and maintenance of security systems; (3) Transportation – all security for intra-site transfers of special nuclear materials (including safe havens), weapons, and other classified material that is not funded through NNSA's Office of Transportation Safeguards; (4) Information Security – provides protection for the classification and declassification of information, critical infrastructure, technical security countermeasures (TSCM), and operations security; (5) Personnel Security – encompasses the processes for administrative determination that an individual is eligible for access to classified matter, or is eligible for access to, or control over, special nuclear material or nuclear weapons; and (6) Materials Control and Accountability (MC&A) – provides for continuous accountability of special nuclear materials. Cyber Security implements policies and procedures for information protection and the design, development, integration, and deployment of all Cyber Security-related and infrastructure components of the Stockpile Stewardship Program and other activities at NNSA landlord sites. Safeguards and Security also includes two construction projects: 05-D-170, Project Engineering and Design and 05-D-701, Security Perimeter Project.

Program Assessment Rating Tool (PART)

In FY 2004 the Safeguards and Security Program was rated by OMB as "Adequate". OMB noted this rating should not be interpreted to mean that security at the Nation's nuclear weapons complex is lax or insufficient. OMB believes that these facilities are some of the most secure facilities in the country; however, the program had not yet determined and published clear and measurable goals and targets. Based on these recommendations, NNSA has significantly revised our Safeguards and Security performance indicators. These new measures are included in this budget. NNSA will continue to work with OMB to determine whether these performance measures can be further defined. Safeguards and Security provided OMB an FY 2005 update to its FY 2004 PART.

Annual Performance Results and Targets

F 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	Provide technical support to the Counter-Terrorism Task Force strategic review of S&S DOE-wide, including cyber security. (MET GOAL)	Assess line management's progress in implementing Integrated Safeguards and Security Management. (MET GOAL)
		Develop a strategic framework for responsive and effective security methodology following the September 11, 2001 events. (MET GOAL)	Complete implementation of "Higher Fences" to enhance the protection of certain Restricted Weapons Data with DOE and DoD. (FMFIA) (MET LESS THAN 80% OF TARGET)
		Complete the milestones listed in the corrective action plans for the Departmental Challenge of Security and Counterintelligence. (FMFIA) (MET GOAL).	

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percentage of Protective Force staff unscheduled overtime (EFFICIENCY MEASURE)	Unscheduled overtime of 32.5%. Plans were established to reduce unscheduled overtime. Delays in acquiring security clearances delayed execution of these plans. All required posts were staffed in accordance with DOE approved post priorities.	Reduce the percentage of Protective Force staff unscheduled overtime to 30%	Reduce the percentage of Protective Force staff unscheduled overtime to 28%	Reduce the percentage of Protective Force staff unscheduled overtime to 25%	Reduce the percentage of Protective Force staff unscheduled overtime to 20%	Reduce the percentage of Protective Force staff unscheduled overtime to 15%	Reduce the percentage of Protective Force staff unscheduled overtime to 15%	Unscheduled overtime to an average of 15% by 2008.
Percentage of each of six Physical	All NNSA sites	Increase the	Increase the	Increase the	Increase the	Increase the	Increase the	90% of the

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Security topical area reviews (program management, protective forces, physical security systems, information security, nuclear materials control and accountability, and personnel security) at the NNSA sites where an evaluation of "effective" is achieved	reported federal evaluations of contractor safeguards and security performance were conducted.*	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 80%	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 85%	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 90%	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 90%	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 90%	percentage of Physical Security topical area reviews at the NNSA where an evaluation of "effective" is achieved to 90%.	physical security topical area reviews at NNSA sites will result in an evaluation of "effective" by 2006.
Percentage of classified and unclassified Cyber Security reviews at the NNSA sites where an evaluation of "effective" is achieved.	All NNSA sites reported federal evaluations of contractor safeguards and security performance were conducted.*	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 80%	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 85%	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 90%	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 90%	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 90%	Increase the percentage of Cyber Security reviews at the NNSA where an evaluation of "effective" is achieved to 90%.	90% of the cyber security reviews at NNSA sites will result in an evaluation of "effective" by 2006.
Percentage of OA, IG and GAO findings that have approved corrective action plans in place within 60 days from receipt of final report.	NNSA sites reported all approved corrective action plans completed.4 sites reported 100% of corrective action items were completed on time. 3 sites reported 90% were completed on time. 1 site reported only 27% completed on time.*	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of the OA, IG, and GAO findings have approved corrective action plans in place within 60 days from receipt of final report.	90% of OA, IG, and GAO findings have approved corrective action plans will in place within 60 days from receipt of final report as of 2004.
Cumulative number of advanced technologies deployed for routine use, which reduce operational security costs while maintaining or increasing security "effectiveness".	N/A	Establish a technology development and application program.	Demonstrate 2 new prototype technologies.	Deploy for routine use a cumulative total of 1 new technology which reduce operational security costs while	Deploy for routine use 1 new technology which will reduce operational security costs while maintaining or	Deploy for routine use 1 new technology which will reduce operational security costs while maintaining or	Deploy for routine use 1 new technology which will reduce operational security costs while maintaining or	Deploy a total of 3 new technologies which will reduce operations security costs while maintaining or

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
				maintaining or increasing security effectiveness.	increasing security effectiveness (Accumulating a total of 2)	increasing security effectiveness (Accumulating a total of 3)	increasing security effectiveness (Accumulating a total of 4)	increasing security effectiveness by 2009.

*Status reporting for FY03 is in accordance to previously established performance indicators and reflects data available prior to yearend. Subsequent data for FY04-09 has been revised to emphasize quantitative performance targets.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Physical Security	**480,320**	**499,069**	**589,491**

Physical Security constitutes the largest funding allocation of the NNSA security effort, integrating personnel, equipment and procedures to protect a facility's physical assets and resources against theft, sabotage, diversion, or other criminal acts. Each NNSA site or facility has an approved Safeguards and Security Site Plan (SSSP) or a facility Master Security Plan detailing protection measures and resources needed to safeguard site security interests. The Physical Security program will: proceed with the five-year planning process for S&S initiatives addressing the redesign of equipment and systems; evaluate options for cost-effective approaches to security to balance technology and personnel usage; and, address protective force unscheduled overtime rates. The program will continue to evaluate options for cost-effective approaches to security, such as reducing overhead costs and identifying and employing improved security technologies through a modest Technology Applications effort. The technology applications endeavor will work with DOE laboratories and parallel government efforts to evaluate technologies that demonstrate promise to improve S&S effectiveness and realize operational efficiencies.

Implementation of the new Design Basis Threat (DBT): The FY 2005 S&S Budget request supports implementation of the revised DBT, which identifies added adversary threat capabilities. This increased threat potential is based upon the experience of the 9/11 terrorist attacks.

Implementation of new DBT protection measures will enhance security across the nation's nuclear weapons complex and provide reasonable assurance for public health and safety. As a result of this revision, the Department of Energy has conducted and continues to update outyear assessments. Analyses have identified several critical S&S enhancements needed at NNSA sites to meet the new level of protection supported by the FY 2005 funding request. The FY 2005 S&S request includes $89.6 million for DBT implementation. An additional $18.3 million for DBT implementation is included within the Secure Transportation Assets (STA) FY 2005 request.

During FY 2005 particular emphasis will be placed on complex-wide physical security vulnerabilities. Measures will include hiring approximately 40 additional contractor armed protective force personnel, acquiring updated weapons and support equipment, and improving first responder training. Physical security systems will be upgraded, developed, and deployed to enhance detection and assessment, add delay and denial capabilities, and to improve perimeter defenses at several key sites. Improvements will be made in the development process for constructing and validating Vulnerability Assessments (VAs), conducting threat analysis to better assess today's dynamic threat environment, and to effectively and efficiently implement new site DBT plans in the outyears.

No provision has yet been made to accommodate identified DBT funding requirements in the outyears although most DBT efforts will depend on outyear funding for continued application and completion.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
▪ **Protective Forces**	**304,891**	**303,516**	**357,762**

These forces are a site's primary front-line protection, consisting of armed and unarmed uniformed officers. Protective forces are an integral part of a site's security posture, trained and practiced in various defensive tactics and procedures to protect site interests. In addition to providing daily site protection, these forces function as first responders, train to manage chemical and biological events, and provide special contingency response capabilities. Funding needs are determined by Site Safeguards and Security Plans (SSSP) protection strategies designed to ensure adequate protective force staffing levels, equipment, facilities, training, management and administrative support.

▪ **Physical Security Systems**	**56,557**	**56,195**	**81,032**

Physical Security Systems provide intrusion detection and assessment barriers, access controls, tamper protection monitoring, and performance testing and maintenance of security systems according to the approved site performance testing plan.

▪ **Transportation**	**407**	**474**	**489**

Includes all security-related transportation budget estimates for intra-site transfers of special nuclear materials (including safe havens), weapons, and other classified material that is not funded in the Secure Transportation Asset Account (STA).

▪ **Information Security**	**17,760**	**21,335**	**22,415**

Information Security provides protection for the classification and declassification of information, critical infrastructure, technical security countermeasures (TSCM), and operations security. Through periodic reviews of classified and sensitive information, Information Security ensures proper document marking, storage and protection of information.

▪ **Personnel Security**	**18,590**	**22,124**	**21,822**

Personnel Security encompasses the processes for administrative determination that an individual is eligible for access to classified matter, or is eligible for access to, or control over, special nuclear material or nuclear weapons. Although the NNSA is responsible for ensuring that all personnel with access to NNSA sites (including current employees, new hires, and visitors) have been appropriately reviewed for access to classified and sensitive matter and materials, the actual NNSA security clearance reviews by the Federal Bureau of Investigation and/or the Office of Personnel Management are budgeted for in the Office of Security budget. Personnel Security represents all other functions of the personnel security process at the NNSA. In accordance with the NNSA Reengineering effort, the NNSA Service Center is assuming the lead for NNSA personnel security initiatives.

	(dollars in thousands) FY 2003	FY 2004	FY 2005
▪ **Materials Control and Accountability**	**22,565**	**25,875**	**26,017**

Materials Control and Accountability (MC&A) provides for continuous accountability of special nuclear materials in accordance with approved site security plans. MC&A functions as a primary deterrent against unauthorized use or diversion of special nuclear material. One of MC&A's principal uses is for deterrence and detection of malevolent insider actions.

▪ **Program Management**	**59,550**	**61,550**	**71,954**

Program Management provides direction, oversight and administration, planning, training, and development for security programs. In FY 2005, S&S funding is being managed by NNSA to implement high priority S&S projects that emerged post 9/11. Activities include the assessment of security implementation efforts through the review of updated security plans. Performance testing, review of vulnerability assessments, and revised threat and vulnerability analysis using the Iterative Site Analysis (ISA) process.

▪ **Technology Application, Physical Security**	**0**	**8,000**	**8,000**

This effort will begin to identify and deploy technology to address both short and long-term solutions to specific physical security needs at NNSA sites. The technology development efforts will focus on promising, emerging technologies that will provide operational efficiencies for the NNSA S&S program. In FY 2005, specific technologies will be selected for prototype and evaluation.

Cyber Security..	**69,200**	**79,740**	**80,500**

Cyber Security implements policies and procedures for information protection and the design, development, integration, and deployment of all Cyber Security-related and infrastructure components of the Stockpile Stewardship Program and other activities at NNSA landlord sites. The Cyber Security Plan addresses the level of security required for information and equipment in the cyber structure. In FY 2004, efforts to identify emerging technology for further research and development will be supported, with the goal of deploying cost saving initiatives to further improve protection of our cyber assets. During FY 2005 the Cyber Security Program will continue to support the cyber security infrastructure within, and between, all NNSA federal offices and contractor locations. The infrastructure activities will upgrade elements to address the latest cyber threats from both external and inside attacks as well as, deploying the latest available cyber security technologies to meet the NNSA mission and performance requirements of the mission activities. The infrastructure activities include support for on-going operation of the unclassified cyber security, classified cyber security, communications security, and TEMPEST programs within each NNSA contractor location. During FY 2005 we will review and update, as needed, the NNSA Cyber Threat Assessment and NNSA cyber security implementation directives to reflect changes in threats, information technology and NNSA mission areas, especially nuclear weapons information activities. The ICSI program will document and initiate the FY 2005 Integrated Cyber Security Initiative Implementation Plan. The ICSI program will continue implementation of the enterprise secure network architecture, including deployment of enterprise-wide management of access controls for

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

nuclear weapons information, and solutions for enterprise-wide user authentication, authorization, public key infrastructure, and other secure enterprise-wide services, such as, enterprise-wide secure e-mail, file sharing, and user collaboration tools.. The ICSI program will update identification of information assets and information flows of nuclear weapon information across the NNSA enterprise. The ICSI program will design and begin implementation of an enterprise-wide intrusion detection system.

▪ **Infrastructure Program**...	**58,786**	**54,628**	**63,637**

The infrastructure program supports the cyber security operations and activities at NNSA landlord sites. The cyber security operations and activities provide a foundation that includes detection of intrusions (hackers and other forms of attacks), vulnerability scanning and correction within each site, implementation of Department and NNSA cyber security policies and practices, and continuous improvement of network and computing system cyber security technologies. The infrastructure program provides the personnel and cyber security technology (hardware and software) to maintain a cyber security posture that complies with all Department and NNSA policies while addressing the increasing number and complexity of cyber security threats.

▪ **Integrated Cyber Security**.......................................	**10,414**	**23,112**	**14,863**

The Integrated Cyber Security Initiative (ICSI) provides the definition, planning, and design efforts for the development and deployment of the NNSA enterprise-wide secure network (ESN). ICSI supports: (1) the ESN Test and Certification Laboratory for the evaluation and testing of ESN components in an isolated, non-production, controlled environment; (2) the Need-to-Know Project to define, demonstrate, test, and deploy software products to manage need-to-know access to all information and computing resources across the ESN; (3) the Authentication Project to define, demonstrate, test, and deploy software products to authenticate all NNSA users who participate in the ESN; (4) the Authorization Project to define, demonstrate, test, and deploy software products to manage user identities and authorizations to use information and computing resources across the ESN; (5) the Information Assets Project to identify the electronic information assets and flow of these assets across the ESN; (6) the Enterprise Directory Services Project to define, demonstrate, test, and deploy software products that provide a enterprise-wide directory repository for information related to the management of the ESN and information assets; (7) the Enterprise Lexicon Project to define and disseminate standard term, definitions, and meta-date for all ESN information assets and activities; (8) the Enterprise Intrusion Detection Project to define, develop, demonstrate, test, and deploy state-of-the-art systems for the detection of anomalous activities, such as hackers and attempts at unauthorized penetration, throughout the ESN; (9) the Enterprise System Management Project to define, develop, demonstrate, test, and deploy software products for the management and support of on-going ESN operation and user activities; and (10) the NNSA Cyber Security Education and Awareness Project to develop, maintain, and deliver continuously updated cyber security information to all NNSA and NNSA contractor personnel.

▪ **Technology Application, Cyber Security**................	**0**	**2,000**	**2,000**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Technology Development will develop and deploy technology to address both short and long-term solutions to specific cyber security needs at NNSA sites. The research and technology development efforts will focus on emerging technologies that will provide cost-effective improvements to the NNSA S&S program. In FY 2005, specific technologies will be identified for further research and technology development.

Construction	**8,641**	**3,661**	**37,000**

The Construction program includes the cost of new and ongoing line-item construction projects that support the safeguards and security mission within the nuclear weapons complex. FY 2005 funding is requested for line item 05-D-170, Project Engineering and Design, to initiate design for two new subprojects: Nuclear Material Safeguards and Security Upgrades (NMSSUP), Phase II to upgrade and replace the existing physical security system at the Los Alamos National Laboratory; and the Y-12 Security Improvements Project (SIP) to provide new detection, assessment, delay and response capability at the Y-12 National Security Complex. In addition, funding is requested for 05-D-701, Security Perimeter Project, at the Los Alamos National Laboratory to provide the ability to isolate the core area of the laboratory and protect vital national security assets.

FY 2004 represents the last year of funding for 99-D-132, Nuclear Material Safeguards and Security Upgrades (NMSSUP), Phase I.

Total, Safeguards and Security......................................	**558,161**	**582,470**	**706,991**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Physical Security**	
Protective Forces: As part of the NNSA's continuing effort to strengthen first responder capability, protective force funding is increased to sustain newly hired staff, equipping and training protective force officers, and to replace aging equipment	+ 54,246
Physical Security Systems: Major upgrades to existing physical security systems or the development and acquisition of newer systems is being pursued. FY 2005 funding provides for systems maintenance, modifications, and improvements to ensure needed reliability and dependability	+ 24,837
Transportation: A modest increase in transportation funding is added to facilitate the movement and relocation of special nuclear material inventories	+ 15
Information Security: The increase in funding is to ensure the continued protection of classified information and sensitive information holdings. The increase allows for the continued declassification of information no longer requiring protection	+ 1,080
Personnel Security: Reduction in funding is anticipated as clearance backlogs are reduced	- 302
Materials Control and Accountability: Increases in funding for this critical S&S function are based on the stabilized maintenance of special nuclear materials inventories and materials measurement procedures	+ 142
Program Management: The increase is needed to meet security management requirements for high priority S&S projects as they are initiated, tested, and implemented to meet post 9/11 requirements.	+ 10,404
Total, Physical Security	+ 90,422

	FY 2005 vs. FY 2004 ($000)
Cyber Security	
▪ **Infrastructure Program:** The increase is needed to address cyber security requirements begun in the aftermath of the September 11, 2001 terrorist attack. The additional funding will provide improvements in NNSA site Cyber Security infrastructures, such as firewalls and media-less workstations to address increased and changing Cyber threats, improves performance of Cyber Security components, such as intrusion detection systems, applies graded protection to nuclear weapon data processed on advanced information technology systems, and supports continued operation of the unclassified cyber security, classified cyber security, communications security, and TEMPEST programs within each NNSA contractor location	+ 9,009
▪ **Integrated Cyber Security:** The decrease reflects the transition of the NNSA enterprise-wide network efforts from definition and design to deployment	- 8,249
Total, Cyber Security	+ 760
Construction	
The increase reflects initiation of two new design subprojects in line item 05-D-170, Project Engineering and Design (Nuclear Material Safeguards and Security Upgrades, Phase II and Y-12 Security Improvements Project) and a new construction project, 05-D-701, Security Perimeter Project, at the Los Alamos National Laboratory. The increase for these efforts is slightly offset by a decrease due to completion of project 99-D-132 in FY 2004	+ 33,339
Total Funding Change, Safeguards and Security	+ 124,521

Capital Operating Expenses and Construction Summary

Capital Operating Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	10,754	11,077	11,409	+ 332	1%
Capital Equipment	6,859	7,065	7,277	+ 212	1%
Total, Capital Operating Expenses	17,613	18,142	18,686	+ 544	1%

Construction Projects

(Dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Appro-priations	FY 2003	FY 2004	FY 2005	Unappropriated Balance
05-D-170 Project Engineering and Design, (PED), LANL, Y-12	88,000	0	0	0	17,000	71,000
05-D-701, Security Perimeter Project, LANL	20,000	0	0	0	20,000	0
99-D-132, Nuclear Materials Safeguards and Security Upgrades Project, Phase I, LANL	60,862	48,650	8,641	3,661	0	0
Total, Construction			8,641	3,661	37,000	

05-D-170, Project Engineering and Design (PED) – Safeguards & Security, Various Locations

- The TEC, obligations and costs reflected are the current estimate of the cost and funding profile required for the design of the two subprojects in this line item. The Security Improvements Project at the Y-12 National Security Complex addresses a recently identified deficiency, and as a result, the full outyear funding has not yet been identified in NNSA's Future-Years Nuclear Security Program (FYNSP). The appropriation column reflects the outyear funding currently in FYNSP.

1. Construction Schedule History

	Fiscal Quarter				
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	Total Estimated Cost ($000) [a]
FY 2005 Budget Request *(A-E and technical design only)*…… ……………	2Q 2005	1Q 2007	2Q 2007	1Q 2012	88,000

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design			
2005	17,000	17,000	17,000
2006	43,000	71,000	55,000
2007	0	0	16,000

3. Project Description, Justification and Scope

This project provides for Architect-Engineering (A-E) services (Title I and Title II) for Safeguards and Security (S&S) construction projects, allowing designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II). The design effort will be sufficient to assure project feasibility, define the scope, provide detailed estimates of construction costs based on the approved design and working drawings and specifications, and provide construction schedules, including procurements. The designs will be extensive enough to establish performance baselines and to support construction or long-lead procurements in the fiscal year in which line item construction funding is requested and appropriated.

Conceptual design studies are prepared for each project using Operations and Maintenance funds prior to receiving design funding under a PED line item. These conceptual design studies define the scope of the project and produce a rough cost estimate and schedule.

[a] The TEC estimate is for design only for the subprojects currently included in this data sheet.

New FY 2005 PED design projects are described below. While not anticipated, some changes may occur due to continuing conceptual design studies or developments occurring after submission of this data sheet. These changes will be reflected in subsequent years. Preliminary estimates for the cost of Title I and II design and engineering efforts for each subproject are provided, as well as very preliminary estimates of the Total Estimated Cost (including physical construction) of each subproject. The final Total Estimated Cost and Total Project Cost for each project described below will be validated and the Performance Baseline will be established at Critical Decision 2 following completion of preliminary design.

FY 2005 Proposed Design Projects

05-01: Nuclear Materials Safeguards and Security Upgrades (NMSSUP) Phase II, LANL

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2005	1Q 2007	2Q 2007	1Q 2012	45,000	125,000-228,000

Fiscal Year	Appropriations	Obligations	Costs
2005	10,000	10,000	10,000
2006	35,000	35,000	25,000
2007	0	0	10,000

This subproject provides for preliminary and final design of the proposed Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP) Phase II. The objective of the NMSSUP is to upgrade and replace the existing physical security system at the Los Alamos National Laboratory in order to address the new protection strategy requirements and deteriorating physical security infrastructure.

NMMSUP Phase II will address the security system at TA-55, the Laboratory's key nuclear facility that houses and processes Category I quantities of Special Nuclear Materials. It is also the proposed site for consolidation of the nuclear missions for the laboratory, including the Chemistry and Metallurgy Facility Replacement Project.

Phase II includes the upgrade or replacement of the existing exterior intrusion detection and assessment system and installation of interior intrusion detection, assessment, delay, access control and security communications equipment for TA-55. Access control facilities for the Protected Area and Material Access Area will be replaced or upgraded. These systems will be integrated with the Argus security control system that has been installed under NMSSUP Phase I.

05-02, Security Improvements Project, Y-12

Fiscal Quarter				Total Estimated Cost (Design Only ($000)	Preliminary Full Total Estimated Cost Projection ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
4Q 2005	1Q 2007	3Q 2007	4Q 2010	43,000 [a]	200,000-300,000

Fiscal Year	Appropriations	Obligations	Costs
2005	7,000	7,000	7,000
2006	8,000 [a]	36,000	30,000
2007	0	0	6,000

This subproject provides for preliminary and final (Title I and Title II) design for the proposed Security Improvements Project at the Y-12 National Security Complex. The project will provide new detection, assessment, delay, and response capability for the Protected Area security perimeter of the Y-12 NSC plant.

The current security perimeter enclosing the Y-12 Protected Area, the PIDAS, was designed in 1984 and constructed between 1986 and 1990. This project will replace the existing PIDAS system with a modern, more robust design incorporating proven state-of-the-art security components and design features.

This project will reduce the 13,200 ft. of existing PIDAS system at Y-12 to approximately 6,000 ft. The project will utilize the existing PIDAS bed for the replacement to the extent possible and will reduce the area within the Protected Area of the plant by 50% to 60%. The project will interface with the Highly Enriched Uranium Materials Facility project and other Y-12 modernization activities defined in the Y-12 NSC 10 year site plan.

[a] The TEC, obligations and costs reflected are the current estimate of the cost and funding profile required for the design of this project. Full outyear funding has not yet been identified in NNSA's FYNSP. The appropriation column reflects the outyear funding currently in FYNSP.

4. Details of Cost Estimate

(dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	73,616	N/A
Design Management costs (3.9% of TEC)	3,419	N/A
Project Management costs (12.5% of TEC)	10,965	N/A
Total, Design Costs (100% of TEC)	88,000	N/A
Total, Line Item Costs (TEC, Design Only)	88,000	N/A

5. Method of Performance

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Project Engineering and Design	0	0	0	17,000	71,000	88,000
Total, Line Item TEC	0	0	0	17,000	71,000	88,000
Other Project Costs						
Conceptual design cost	0	400	2,875	100	0	3,375
Other project-related costs	0	1,500	8,025	6,600	12,500	28,625
Total Other Project Costs	0	1,900	10,900	6,700	12,500	32,000
Total Project Cost (TPC)	0	1,900	10,900	23,700	83,500	120,000

05-D-701, Security Perimeter, Los Alamos National Laboratory, Los Alamos, New Mexico

- This project will utilize a design-build acquisition strategy which offers many benefits for a project of this type, including a single source for construction activities, cost control and accountability, and may be accommodated under the existing DOE Order for construction project management. The project is requesting full design and construction funding in FY 2005 consistent with this acquisition strategy and in order to minimize project risk.

- This project is still in the Planning Phase. As a result, the cost and schedule are preliminary estimates and are subject to change until the Performance Baseline is approved by the Acquisition Executive (Critical Decision 2).

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2005 Budget Request *(Preliminary Estimate)*.......	1Q 2005	1Q 2006	1Q 2005	3Q 2006	20,000	24,024

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
2005	20,000	20,000	13,000
2006	0	0	7,000

3. Project Description, Justification and Scope

Project Description

This project provides Los Alamos National Laboratory (LANL) the ability to isolate the core area of the site from unscreened vehicle access in order to protect vital national security assets, Government property, and human life from possible terrorist activity. This project will provide the capability to enact a graded closure of the core area of the site depending on the NNSA SECON levels in effect at the time. During elevated threat conditions, all but emergency and designated Government vehicles may be prevented from entering the core area of the site. Staffed access control stations with vehicle queuing approaches, necessary utilities, and security equipment will be required to screen vehicles and provide the capability of closing vehicle access if required.

This project includes the installation of two access control stations at key locations, security upgrades to existing stations, selected road closures, and selected road modifications within the LANL site. Cooperation and negotiation with Los Alamos County will be required to re-obtain a small portion of the Los Alamos County landfill that sits on land leased from DOE. The DOE contract with LA County was previously modified for this potential action.

Project Justification

As a result of the events of September 11, 2001, the nature of the terrorist threat has changed significantly in terms of the potential magnitude of the attack as well as the terrorists' motivations, targets, and methods. The most recent attacks appeared to be intent on maximizing disruption, destruction and casualties, and include the willingness to conduct suicide attacks. In recognition of this increased threat, LANL security and management have determined that there is a critical need to upgrade the physical protection around critical assets at the core of the site.

LANL is one of the few DOE complex sites where the general public has access to the core technical area and has public roads that pass in close proximity to Category I or II facilities. Temporary measures have recently been implemented to help protect particular Laboratory assets, but long-term measures are required to provide an additional level of protection to the core of the Laboratory which houses vital national assets, government property, and critical scientific and support staff. Unauthorized (unscreened) access in the future must be restricted and controlled to minimize the possibility of a terrorist threat being introduced into the core area.

The long-term solution to security concerns is to provide an integrated site access control system that will provide security for the core areas, SNM, and NNSA identified critical mission capabilities. This integrated system will establish a security perimeter around the core area of the Laboratory, create significantly better stand-off protection, allow the immediate implementation of higher SECON levels, improve the ability to maintain higher SECON levels, improve the effectiveness of the SECON screening process, and reduce the long-term SECON costs by eliminating the inefficient SECON configuration currently in place. It is noted that security goals cannot be accomplished without some improvements to the road system.

Project Scope

This project includes the following key elements:

Access Control Stations

Primary vehicle access into the core area of LANL will occur at the access control stations. Two new stations will be constructed, and existing stations will be modified to accomplish this goal. These stations will control access, provide areas for more in depth screening or searches, provide space for queuing of vehicles into and out of the stations, provide a single point for isolation of the site, and act as a primary interface area with the general public. The capability to process visitors and the general public, in limited size vehicles, will be accommodated at the new access control stations. New access control stations will be installed off of East Jemez Road and on West Jemez Road at the "back gate" area near NM-4. The Pajarito Road access control stations installed under an earlier GP project will be modified to provide enhanced security, isolation, and access control capabilities.

Road Closures

In order to assure that vehicle traffic flows through the access control stations, Diamond Drive must be permanently closed to unscreened vehicle traffic by physical separation of the road. West Jemez Road (NM 501) will also be closed to unscreened vehicle traffic. Vehicle barriers will be provided at specific points to protect critical areas. West Road and the Ski Hill Road will be isolated from West Jemez Road by vehicle gates and barriers. The commuter bus area and existing parking lots must be accommodated. Emergency vehicle access will be maintained where required to assure response times remain low to assure life and property saving actions can be taken in a timely manner.

Ski Hill Road

Approximately 1½ miles of new road must be constructed to connect West Road and the existing Ski Hill Road to maintain public access and to provide an alternative evacuation route. An existing but abandoned road will be modified for this purpose. Vehicle barriers and fence will be used to prevent vehicle access onto West Jemez Road. The existing Ski Hill Road and West Road will be isolated from West Jemez Road. Gates will be installed at two locations for this purpose and for future emergency access or egress routes.

Relocation and Demolition

Minor relocation and demolition of existing structures, approximately 175 parking spaces, a bus lot, an old radio shop building, and utilities will occur but will depend on the exact routing of roads and structures. Final routing of the roads will not occur until detailed design, but the general route is defined.

These staffed access control stations will allow closure of several temporary guard posts currently located within the TA-3 area. Diamond Drive must be permanently closed to unscreened traffic just south of the existing bridge across Los Alamos Canyon. West Jemez Road must be permanently closed to unscreened traffic. The east access control station road will require some improvements at the intersections with the north bypass road and with Diamond Drive. The west access control station road will require some improvements on West Jemez Road. Vehicle access from public parking lots and roads will be blocked by the use of barriers and road closures in order to prevent vehicles from bypassing the access control stations.

Project Milestones:

FY 2005:	Establish Performance Baseline (Critical Decision 2/3)	1Q
FY 2006:	Completion of Construction	3Q
FY 2007:	Project Complete (Critical Decision 4)	1Q

4. Details of Cost Estimate

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	1,604	N/A
Design Management costs (1.6% of TEC)	320	N/A
Project Management costs (1.2% of TEC)	240	N/A
Total, Design Costs (10.8% of TEC)	2,164	N/A
Construction Phase		
Improvements to Land (roads, bridges, drainage)	4,016	N/A
Buildings	2,874	N/A
Special Equipment	1,856	
Other Structures (Radio Shop)	172	N/A
Utilities	1,265	N/A
Standard Equipment	1,394	N/A
Removal less salvage	115	N/A
Inspection, design and project liaison, testing, checkout and acceptance (2.8% of TEC)	555	N/A
Construction Management (5.5% of TEC)	1,105	N/A
Project Management (4.3% of TEC)	858	N/A
Total, Construction Costs (71.1% of TEC)	14,210	N/A
Contingencies		
Design Phase (1.6% of TEC)	324	N/A
Construction Phase (16.5% of TEC)	3,302	N/A
Total, Contingencies (18.1% of TEC)	3,626	N/A
Total, Line Item Costs (TEC)	20,000	N/A

5. Method of Performance

Design, construction, and procurement will be accomplished by a competitive best value, fixed-price, and design-build contract. Design-build is a project delivery system where a single entity performs both the design and construction. Some advantages of design-build include a single source for construction activities, cost control and accountability. The baseline for the project will be established at the simultaneous CD-2 and 3, based on the selected Design/Build contractor's fixed-price proposal. The removal of existing utilities located on the building sites and installation of new utilities will be performed by the site services contractor or by BOA contractors under fixed price contracts. The characterization and demolition work will be accomplished under a competitive solicitation from pre-qualified contractors.

6. Schedule of Project Funding [a]

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	0	1,604	0	1,604
Construction	0	0	0	11,396	7,000	18,396
Total, Line Item TEC	0	0	0	13,000	7,000	20,000
Other Project Costs						
Conceptual design cost	0	1,400	500	0	0	1,900
NEPA documentation costs	0	350	0	45	0	395
Other ES&H Costs	0	40	0	47	5	92
Other project-related costs	0	710	0	425	502	1,637
Total Other Project Costs	0	2,500	500	517	507	4,024
Total Project Cost (TPC)	0	2,500	500	13,517	7,507	24,024

[a] Project Management, Quality Assurance, LIR Implementation, Project Execution Plan, Siting Studies, Estimating Support, Scheduling and Controls Support, Safeguards and Security Analysis, Design-Build Procurement, Source Selection work, Value Engineering Study, Fire Hazards Assessment, Permits, Administrative Support, Operations and Maintenance Support, Operating Manuals & Procedures, Operations Testing, Readiness Assessment.

7. Related Annual Funding Requirements

(FY 2005 dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs[a]	80	N/A
Annual facility maintenance/repair costs[b]	400	N/A
Programmatic operating expenses directly related to this facility[c]	4,400	N/A
Utility costs	20	N/A
Total related annual funding (operating from FY 2006 through FY 2026)	4,900	N/A

[a] The cost of operations are based on historical data and averages $4/sf/year for Office Buildings.

[b] Based on projected annual costs for LANL site services subcontractor as derived from historical maintenance and repair costs for LANL facilities and road systems. Includes snow plowing and road maintenance.

[c] Annual programmatic operating expenses are estimated based on representative operating expenses of 6 to 14 security people per shift, 24 hours per day, 365 days per year. The majority of this funding is expected to come from DOE. LANL has evaluated staffing methods and consequently this option reduces operating costs over the current temporary guard post arraignment. 6 Security personnel during normal hours, 13 during peak morning and noon traffic hours.

Defense Nuclear Nonproliferation

Defense Nuclear Nonproliferation

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Defense Nuclear Nonproliferation

Proposed Appropriation Language

For Department of Energy expenses, including the purchase, construction, and acquisition of plant and capital equipment and other incidental expenses necessary for atomic energy defense, defense nuclear nonproliferation activities, in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion, [$1,327,612,000] *$1,348,647,000*, to remain available until expended.

Explanation of Change

The only change from the language proposed in FY 2004 is the proposed funding amount.

Defense Nuclear Nonproliferation

Funding Schedule by Subprogram

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Original Appropriation	FY 2004 Adjustments	FY 2004 Comparable Appropriation	FY 2005 Request
Defense Nuclear Nonproliferation					
Nonproliferation and Verification Research and Development............	256,092	231,997	0	231,997	220,000
Nonproliferation and International Security........................	130,873	110,107	+ 3,977	114,084	124,000
International Nuclear Materials Protection and Cooperation..............	333,029	258,487	0	258,487	238,000
Russian Transition Initiatives.............	39,081	39,764	0	39,764	41,000
HEU Transparency Implementation....	17,118	17,894	0	17,894	20,950
International Nuclear Safety................	33,570	3,977	- 3,977	0	0
Elimination of Weapons-Grade Plutonium Production........................	49,221	49,735	+ 15,300	65,035 [a]	50,097
Accelerated Material Disposition.........	894	0	0	0	0
Fissile Materials Disposition................	445,528	652,818	0	652,818	649,000
Offsite Source Recovery Project.........	2,172	0	+ 1,961	1,961	5,600
Subtotal, Defense Nuclear Nonproliferation..................	1,307,578	1,364,779	+ 17,261	1,382,040	1,348,647
Use of Prior Year Balances................	-84,125	-45,000	-3,000	- 48,000	
Total, Defense Nuclear Nonproliferation..................	1,223,453	1,319,779	+ 14,261	1,334,040	1,348,647

Public Law Authorization:

P.L. 108-136, National Defense Authorization Act, FY 2004

P.L. 108-137, Energy and Water Development Appropriations Act, FY 2004

[a] Funds reappropriated from unobligated balances expiring in FY 2003 transferred from Department of Defense in accordance with the National Defense Authorization Act.

[b] Excludes $3,000,000 for EEOICPA Reprogramming action approved in FY 2004.

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Defense Nuclear						
Nonproliferation & Verification. Research and Development..	220,000	229,000	235,000	246,000	248,000	1,178,000
Nonproliferation and International Security.............	124,000	119,038	119,700	119,800	120,400	602,938
International Nuclear Materials Protection and Cooperation....	238,000	244,000	250,000	258,000	259,818	1,249,818
Russian Transition Initiatives..	41,000	42,000	43,000	43,000	44,000	213,000
HEU Transparency Implementation.......................	20,950	21,212	21,000	20,000	20,000	103,162
Elimination Weapons Grade Plutonium Production...	50,097	56,000	59,497	60,339	66,862	292,795
Fissile Material Disposition........	649,000	661,000	673,000	685,000	697,000	3,365,000
Offsite Source Recovery...........	5,600	8,750	8,803	8,861	8,920	40,934
Total, Defense Nuclear Nonproliferation.......................	1,348,647	1,381,000	1,410,000	1,441,000	1,465,000	7,045,647

FY 2003 Execution

(dollars in thousands)

	FY 2003 Approp	Use of PY Balance	Rescission	Supple-mental	Reprogram-ming/ Transfers	Comp Adjustment	Current FY 2003 Comparable
Nonproliferation and Verification R&D...........	283,407	0	- 1,824	20,000	- 45,491	0	256,092
Nonproliferation and International Security.....	92,668		- 596	22,000	+ 500	+ 16,301	130,873
International Nuclear Materials Protection and Cooperation............	233,077		- 1,500	106,000	- 4,548	0	333,029
Russian Transition Initiatives.....................	39,334		- 253	0	0	0	39,081
HEU Transparency Implementation............	17,229		- 111	0	0	0	17,118
International Nuclear Safety...............	11,576		- 75	0	+ 25,354	- 3,285	33,570
Elimination of Weapons Grade Plutonium Production....................	49,339		- 318	0	+ 200	0	49,221
Accelerated Material Disposition....................	14,000	0	- 90	0	0	- 13,016	894
Fissile Materials Disposition....................	448,000	- 64,000	- 2,472	0	0	0	381,528
Offisite Source Recovery Project...........	0	0	0	0	0	+ 1,837	1,837
Use of PY Balances........		- 20,125					-20,125
Total, Defense Nuclear Nonproliferation..............	1,188,630	- 84,125	- 7,239	148,000	- 23,985	+ 1,837	1,223,118

FY 2004 Appropriation
(dollars in thousands)

	FY 2004 Enacted Approp	Use of Prior Yr Balance	Pending 0.59% Rescission	Supplemental	Reprogram-ming/ Transfers	Comp Adjustments	Current FY 2004 Comp
Nonproliferation and Verification Research and Development..........	233,373	0	- 1,376	0	0	0	+ 231,997
Nonproliferation and International Security..................	110,734	0	- 627	0	0	+ 3,977	+ 114,084
International Nuclear Materials Protection and Cooperation............	260,000	0	- 1,513	0	0	0	+ 258,487
Russian Transition Initiatives.................	40,000	0	- 236	0	0	0	+ 39,764
HEU Transparency Implementation.......	18,000	0	- 106	0	0	0	+ 17,894
International Nuclear Safety........	4,000	0	- 23	0	0	- 3,977	+ 0
Elimination of Weapons Grade Plutonium Production..............	65,300 [a]	0	- 265	0	0	0	+ 65,035
Accelerated Material Disposition.............	0	0	0	0	0	0	+ 0
Fissile Materials Disposition.............	656,505	0	- 3,687	0	0	0	+ 652,818
Offsite Source Recovery Project.....	0	0	0	0	0	+ 1,961	+ 1,961
Use of PY Balances................	-45,000	0			-3,000		- 48,000
Total, Defense Nuclear Nonproliferation........	1,342,912	0	- 7,833	0	-3,000	+ 1,961	+ 1,334,040

Mission

The Defense Nuclear Nonproliferation mission is to provide technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance the technologies to detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons.

[a] Includes reappropriated portion of Department of Defense transferred balances expiring in FY 2003, $15,300.

Benefits

The Defense Nuclear Nonproliferation program supports the NNSA and DOE mission to protect our national security by preventing the spread of nuclear weapons and nuclear materials to terrorist organizations and rogue states. These efforts are implemented through a Global Partnership.

Program Goal

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environment aspects of the mission plus seven general goals that tie to the strategic goals. The Defense Nuclear Nonproliferation program supports the following goals:

The Defense Nuclear Nonproliferation program has one program goal which contributes to General Goal 2 in the "goal cascade":

General Goal 2, Nuclear Nonproliferation, provide technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance the technologies to detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons

Contribution to General Goal 2

Within the Defense Nuclear Nonproliferation appropriation, eight programs each make unique contributions to General Goal 2 as follows:

The Nonproliferation and Verification Research and Development program (Program Goal 02.40.00.00) contributes to this goal by developing new technologies to improve U.S. capabilities to detect and monitor nuclear weapons production and testing worldwide.

The HEU Transparency program (Program Goal 02.41.00.00) contributes to this goal by providing reasonable assurances that the LEU being purchased under the Russian HEU purchase agreement is derived from dismantled nuclear weapons, by developing and performing mutually agreeable transparency measures, to permanently process 500 MT of HEU into non-weapons material by 2013.

The Elimination of Weapons-Grade Plutonium Production program (Program Goal 02.42.00.00) contributes to this goal by facilitating shutdown of the three remaining weapons-grade plutonium production reactors in the Russian Federation through: (1) construction of a new fossil-fuel (coal) plant at Zheleznogorsk; (2) refurbishment of an existing fossil-fuel (coal) power plant at Seversk; and (3) execution of a nuclear safety upgrades project to improve reactor safety pending shutdown of the reactors.
The Nonproliferation and International Security program (Program Goal 02.44.00.00) contributes to this goal by detecting, preventing, and reversing the proliferation of weapons of mass destruction (WMD) materials, technology, and expertise, and to strengthen the nonproliferation regime.

The Russian Transition Initiatives program (Program Goal 02.45.00.00) contributes to this goal by preventing adverse migration of weapons of mass destruction expertise by engaging weapons experts in peaceful efforts and by helping to downsize the Russian nuclear weapons complex.

The International Nuclear Materials Protection and Cooperation program (Program Goal 02.46.00.00) contributes to this goal by working in Russia and other regions of concern to (1) secure and eliminate vulnerable nuclear weapons and weapons-usable material; (2) locate, consolidate and secure radiological materials that can be used in a dirty bomb; and (3) install detection equipment at border crossings and Mega-Seaports to prevent and detect the illicit transfer of nuclear material.

The Fissile Materials Disposition program (Program Goal 02.47.00.00) contributes to this goal by disposing of inventories of U.S. Weapons-grade plutonium and highly enriched uranium (HEU) as well as providing technical support for, and ultimately implementation of, efforts to obtain the reciprocal disposition of Russian surplus weapon-grade plutonium.

NNSA has assumed responsibility for the Offsite Source Recovery Project (Program Goal 02.62.00.00) from the Office of Environmental Management. This program recovers excess and unwanted sealed sources from non-DOE sites, and places them in storage at DOE facilities to reduce the risk of their possible use in a radiological dispersal device. The cost of this effort is projected to total about $40 million through the FYNSP period.

Annual Performance Results and Targets

Annual performance results and targets for Defense Nuclear Nonproliferation work is included in the sub-program sections of this budget where it is more meaningful to the reader. During FY2004 budget appropriations process, Congress eliminated funding for the International Safety Program (Program Goal 02.43.00.00) and the Accelerated Material Disposition program (Program Goal 02.48.00.00). The Accelerated Material Disposition program was a new initiative and therefore had no performance results of targets. Performance results and targets for FY2000-FY2003 for the International Nuclear Safety Program are documented in this section for completeness.

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
International Nuclear Safety			
Complete a full-scope simulator for Kola Unit 4 and Balakovo Unit 4 in Russia, and for South Ukraine Unit 3 in Ukraine. (MET GOAL	Complete safety parameter display systems for Ukraine's South Ukraine nuclear plant unit 3, and Zaporizhzhya nuclear plant units 2 and 4. (MET GOAL)	Develop a small nuclear safety pilot program between the U.S. Department of Energy and the Vietnamese Atomic Energy Commission. (MET GOAL)	Successfully complete and close down the Soviet-designed reactor safety program. (MIXED RESULTS)
	Complete implementation of symptom-based emergency operating instructions at the Ignalina plant in Lithuania. (MET GOAL		Evaluate and prioritize nuclear safety concerns at nuclear power plants, research reactors and non-reactor nuclear fuel cycle facilities, and prepare needs assessments for technology transfers of nuclear safety methods based on risk with potential participant countries. (MIXED RESULTS)

Means and Strategies
The Defense Nuclear Nonproliferation program will use various means and strategies to achieve its program goals. However, various external factors may impact the ability to achieve these goals. The program also performs collaborative activities to help meet its goals.

The Defense Nuclear Nonproliferation program goal is to detect, prevent, and reverse the proliferation of Weapons of Mass Destruction (WMD) while promoting nuclear safety worldwide. Our programs address the danger that hostile nations or terrorist groups may acquire weapons of mass destruction or weapons-usable material, dual-use production or technology, or WMD capabilities. This emphasizes the importance of our programs to properly secure or eliminate vulnerable stockpiles of weapon-usable materials in Russia and countries of concern.

The events of September 11 make it clear that our threat detection programs are required on an accelerated basis. We will fully exploit the world-class expertise of our National Laboratories to increase our design testing, and fielding capabilities for detection technologies.

The pace and nature of treaties and agreements, extremely poor economic conditions in host countries, political and economic uncertainties in the former Soviet Union, and the unwillingness of threshold states to engage in negotiations can all have dramatic effects on our performance and effectiveness. Customs issues, Nuclear Regulatory Commission actions, and other Department of Energy elements can also cause significant impacts to our ability to achieve program objectives.

We work with many different U.S. agencies, international organizations, and non-governmental organizations to further our nonproliferation goals. All major policy issues are coordinated with the National Security Council, and we also work closely with the Departments of State and Defense on many of our programs. We continually leverage our considerable nuclear nonproliferation Research and Development base within the national laboratory complex. In addition, NNSA coordinates with the Department of Commerce on export control policy and international agreements, and the Nuclear Regulatory Commission on nuclear safety programs, as well as working with the International Atomic Energy Agency to further international safeguards. The United States Enrichment Corporation and the Tennessee Valley Authority are involved in the HEU purchase agreement and fissile materials disposition programs, and the U.S. Industrial Coalition is NNSA's partner in the Initiatives for Proliferation Prevention and Nuclear Cities Initiatives. The U.S. Agency for International Development, the Nuclear Energy Agency, the intelligence community, and other agencies are also involved in some programs. Finally, we anticipate frequent collaborations with the new Department of Homeland Security as that new department assumes its role in the national security arena.

Validation and Verification

To validate and verify program performance, NNSA will conduct various internal and external reviews and audits. NNSA's programmatic activities are subject to continuing review by the Congress, the General Accounting Office, the Department's Inspector General, the National Security Council, the Defense Nuclear Facilities Safety Board, the Department's Office of Engineering and Construction Management, and the Department's Office of Independent Oversight and Performance Assurance. Each year numerous external independent reviews are conducted of selected projects. Additionally, NNSA Headquarters senior management and Field managers conduct frequent, in-depth reviews of cost, schedule, and scope to ensure projects are on-track and within budget.

NNSA has established a comprehensive validation and verification process as part of its Planning, Programming, Budgeting and Evaluation (PPBE) system. Long-term performance goals are established/validated during the Planning Phase and linked in a performance cascade to annual targets and detailed technical milestones. During the Programming Phase, budget and resources trade-offs and decisions are evaluated based on the impact to annual and long-term performance measures. These NNSA decisions are documented and used to develop the budget requests during the Budgeting Phase. Program and financial performance for each measure is monitored and progress verified during the Execution and Evaluation Phase.

NNSA validation and verification activities during the PPBE Execution and Evaluation phase include a set of tiered performance reviews to examine everything from detailed technical progress to program management controls to corporate performance against long-term goals. This set of reviews includes: (1) the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART); (2) NNSA Administrator Program Reviews; (3) Program Managers Detailed Technical Reviews; (4) quarterly reporting of progress through the Department's JOULE performance tracking system; and (5) the NNSA Administrator's Annual Performance Report.

NNSA is using the OMB PART process to perform annual internal self-assessments of the management strengths and weaknesses of each NNSA program. Among other things, the PART process helps NNSA ensure that quality, clarity, and completeness of its performance data and results are in accordance with standards set in the Government Performance and Results Act of 1993 and reinforced by the President's Management Agenda. Independent PART assessments conducted by OMB provide additional recommendations to strengthen NNSA programs.

Each NNSA program is reviewed at least annually by the NNSA Administrator during the NNSA Administrator Reviews. These reviews involve all members of the NNSA management council to ensure progress and recommendations are fully integrated for corporate improvement. The focus of these reviews is to verify and validate that NNSA programs are on track to meet their long-term goals and annual targets. A second more detailed review of each program is conducted by the program managers. These Program Manager Detailed Technical Reviews are normally held at least quarterly during the year. The focus of these reviews is to verify and validate that NNSA contractors are achieving detailed technical milestones that result in progress towards annual targets and long-term goals. These two reviews work together to ensure that advanced warnings are given to NNSA managers in order for corrective actions to be implemented. NNSA sites are responsible and accountable for accomplishing the verification and validation of their and their sub-contractors performance data and results prior to submission to NNSA Headquarters.

The results of all of these reviews are reported quarterly in the Department's JOULE performance tracking system and annually in the NNSA Administrator's Annual Performance Report and the DOE Performance Accountability Report (PAR). Both documents help to measures the progress NNSA programs are making toward achieving annual targets and long-term goals. These documents are at a summary level to help senior managers verify and validate progress towards NNSA and Departmental commitments listed in the budget.

In addition, the General Accounting Office, Inspector General, National Security Council, Foster Panel, Defense Nuclear Facility Safety Board, and Secretary of Energy Advisory Board provide independent reviews of NNSA programs. Recent Inspector General and General Accounting Office reports on the

Defense Nuclear Nonproliferation programs include Audit of the Materials Protection, Control, and Accounting program (MPC&A) (A03Al001); Pit Disassembly and Conversion Facility at the Savannah River Site (A03SR021); and Russian Plutonium Production (360357).

Program Assessment Rating Tool (PART)

OMB used PART to review one NN program for the FY2005 budget. The OMB assessment of the Elimination of Weapons Grade Plutonium Production program concluded that it is a new program for NNSA and even though it has developed solid, tangible performance measures – it is too new to have developed a track record of results that would justify any rating other than "Results Not Demonstrated" at this time. OMB is directing NNSA to evaluate the possibility of re-allocating funds from other delayed or lower priority programs to accelerate the EWGPP work and to establish a funding profile more consistent with a construction project.

For the FY 2004 budget, OMB rated one NN program, the International Nuclear Materials Protection and Cooperation Program (MPC&A), and it achieved the highest score of Effective. MPC&A was given very high marks for program purpose and performance measurement data. NNSA is completing the recommendations identified by OMB. All findings from last year's assessments have been addressed. These changes are discussed in more detail in each program's budget submissions. In addition, NNSA provided OMB with an FY2005 PART update for the MPC&A program that was reviewed in FY2004.

Funding by General and Program Goal

(dollars in thousands)

	FY 2003 Comp Approp	FY 2004 Comp Approp	FY 2005 Request	FY 2006	FY 2007	FY 2008	FY 2009
General Goal 2, Defense Nuclear Nonproliferation							
Program Goal 2.1, Nonproliferation and Verification Research and Development	256,092	231,997	220,000	229,000	235,000	246,000	248,000
Program Goal 2.2, Nonproliferation and International Security...........	130,873	114,084	124,000	119,038	119,700	119,800	120,400
Program Goal 2.3, International Nuclear Materials Protection and Cooperation	333,029	258,487	238,000	244,000	250,000	258,000	259,818
Program Goal 2.4, Russian Transition Initiatives	39,081	39,764	41,000	42,000	43,000	43,000	44,000
Program Goal 2.5, HEU Transparency Implementation .	17,118	17,894	20,950	21,212	21,000	20,000	20,000
Program Goal 2.6, International Nuclear Safety ..	33,570	0	0	0	0	0	0
Program Goal 2.7, Elimination of Weapons Grade Plutonium Production	49,221	65,035	50,097	56,000	59,497	60,339	66,862
Program Goal 2.8, Accelerated Materials Disposition	894	0	0	0	0	0	0

	FY 2003 Comp Approp	FY 2004 Comp Approp	FY 2005 Request	FY 2006	FY 2007	FY 2008	FY 2009
Program Goal 2.9, Fissile Materials Disposition	445,528	652,818	649,000	661,000	673,000	685,000	697,000
Program Goal 2.10, Offsite Source Recovery Project	1,837	1,961	5,600	8,750	8,803	8,861	8,920
Subtotal, Defense Nuclear Nonproliferation	1,307,243	1,382,040	1,348,647	1,381,000	1,410,000	1,441,000	1,465,000
Use of Prior Year Balances	- 84,125	- 48,000	0	0	0	0	0
Total, Defense Nuclear Nonproliferation	1,223,118	1,334,040	1,348,647	1,381,000	1,410,000	1,441,000	1,465,000

Funding for a proportional share of NNSA's annual assessment required to pay for Defense Contract Audit Agency activities is included in this appropriation. The amount estimated for Defense Nuclear Nonproliferation is $361,878 for FY 2004 and $368,611 for FY 2005, to be paid from program funding.

Funding for a proportional share of the NNSA assessment for conducting External Independent Reviews on pending construction projects is included in this appropriation. The amount estimated for Defense Nuclear Nonproliferation is $614,000 to be paid from program funding.

Significant Program Shifts

The 1998 U.S.-Russia Joint Scientific and Technical Cooperation Agreement, which provided limited liability protection for technical work (pre-construction) in support of plutonium disposition, expired in July 2003. Senior officials in both countries are working to develop satisfactory liability provisions to be added to the September 2000 U.S.-Russia Plutonium Management and Disposition Agreement. This Agreement covers design, construction and operation of facilities required for plutonium disposition.

Preliminary site characterization work in Russia is required to begin exchanging detailed technical engineering data required to "Russianize" the design of the U.S. MOX Facility. However, this work was not completed when needed in November 2003. Therefore, there will be a delay of approximately one year in the start of construction and an increase in the cost of the U.S. plutonium disposition program due to the Congressional requirement to maintain parallel progress in both programs. The start of construction for both the U.S. and Russian MOX facilities is now planned for May 2005.

Global Partnership

The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, formed at the Kananaskis Summit in June 2002 has recommitted the G8 nations (the United States, Canada, France, Germany, Italy, Japan, Russia, and the United Kingdom) to address nonproliferation, disarmament, counter-terrorism, and nuclear safety issues. The G8 leaders have pledged to devote up to

$20 billion over ten years to support cooperative efforts, initially in Russia, and have invited other similarly motivated countries to participate in this partnership. President Bush has committed the U.S. to provide $10 billion over ten years to be matched by $10 billion from the other members, attesting to the belief that nonproliferation concerns are of the highest government priority; and therefore that this program's work is of paramount importance for the security of the nation and the world. The following table reflects the Department of Energy activities by country and program which are part of the government-wide activities totaling $1 billion in the years FY 2005-2009

U.S. Nonproliferation and Threat Reduction Assistance to Former Soviet States
(dollars in millions)

Summary by Country	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Russia	427.9	405.9	422.6	412.7	406.2
Kazakhstan	6.5	17.1	15.6	3.7	4.0
Ukraine	4.3	16.4	16.4	4.5	4.9
Uzbekistan	.5	.6	.6	.6	.6
Georgia	.1	.1	.1	.1	.1
Total, Russia & FSU	439.2	440.1	455.3	421.6	415.8

Risk Based Analysis

The FY 2005 Budget request was developed by taking into account a number of risk-based factors such as: likelihood of crisis, urgency, legal or moral obligation. The Defense Nuclear Nonprolfieration program is continuing to formalize this approach to make it a useful tool that can be applied to the allocation of funding.

Nonproliferation and Verification Research and Development

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Nonproliferation and Verification					
Proliferation Detection.............	128,012	126,127	111,544	- 14,583	- 11.6%
Nuclear Explosion Monitoring.	94,979	96,592	101,931	+ 5,339	+ 5.5%
Chemical and Biological National Security....................	23,064	0	0	0	0
Supporting Activities................	10,037	9,278	6,525	- 2,753	- 29.7%
Total, Nonproliferation and Verification R&D......................	256,092	231,997	220,000	- 11,997	- 5.2%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Nonproliferation and Verification R&D..................	220,000	229,000	235,000	246,000	248,000	1,178,000

Description

This program will develop new technologies to improve U.S. capabilities to detect and monitor nuclear weapons production and testing worldwide.

Benefits to Program Goal 02.40.00.00 Nonproliferation and Verification Research and Development

The Nonproliferation and Verification Research and Development program has two main subprograms that make unique contributions to Program Goal 02.40.00.00. The Proliferation Detection subprogram coordinates with other agencies the development of advanced remote sensing and ground-based technologies to address the most challenging problems related to detection, location, and analysis of global proliferation of nuclear weapon technology, and the diversion of special nuclear materials. The Nuclear Explosion Monitoring subprogram builds the nation's operational treaty monitoring space sensors, produces and updates the regional geological datasets to enable operation of the nation's ground based treaty monitoring networks. In addition, the Supporting Activities line includes crosscutting costs of the two main Office of Nonproliferation Research and Engineering subprograms such as participation in DOE's Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Develop improved technologies and systems for early detection, identification, and response to weapons of mass destruction proliferation and illicit materials trafficking. (MET GOAL) Test first generation prototype hand-held detector for enhanced detection of chemical agents. (MET GOAL) Complete architecture development to protect a "special event" from biological attacks. (MET GOAL) Launch the Multispectral Thermal Imager (MTI) small satellite to demonstrate temperature measurement from space for the passive detection and characterization of proliferant activities. (MET GOAL)	Demonstrate systems to protect key infrastructure and special events from chemical and biological attacks. (MET GOAL) Conduct Critical Design Reviews for three new-generation nuclear explosion-monitoring sensors that are proposed for future satellite deployment. (MET GOAL)	Field a demonstrated, deployable prototype biological threat system at the Winter Olympics. (MET GOAL) Demonstrate a chemical agent detection system in a subway system. (MET GOAL) Start satellite sensor-payload assembly of operational nuclear explosion detection payloads for the next generation of Global Positioning System satellites scheduled for first launch in 2004. (MET GOAL) Perform experiments of prototype, unmanned-aerial-vehicle-based Light Detection and Ranging (LIDAR) systems to detect proliferation. (MIXED RESULTS)	Demonstrate prototype commercial cargo inspection system to detect fissile materials and high explosives . (MET GOAL) Provide two assays for biological threat agents to the Center for Disease Control Laboratory Response Network. (MET GOAL) Demonstrate a fixed system to protect complex, key infrastructure facilities, components, and capabilities. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Development of Advanced U.S. Capabilities to Detect Nuclear Weapons Proliferation: Number of advanced radiation and remote sensing technologies developed and evaluated through customized tests that challenge and characterize their operating parameters. These advanced technologies are intended to improve U.S. capability to detect the early stages of nuclear weapon programs.	4	7	8	6	7	7	9	Annual targets advance the state of the art in advanced technology to provide future capabilities for U.S. monitoring agencies.
Development of Advanced U.S. Capabilities to Detect Nuclear Explosions: Number of advanced technologies and operational systems (e.g. satellite payloads and seismic stations calibration data sets) delivered to U.S. national security users which improves the accuracy and sensitivity of nuclear weapons test monitoring.	4	6	6	11	8	10	5	Annual targets advance state of the art in concert with deployment schedule of user agencies.
Programmatic Oversight and Review:Annual percentage of all active R&D projects for which an independent R&D merit assessment has been completed within the last three years to determine the scientific quality and continued user and mission relevance.	20%	40%	70%	100%	100%	100%	100%	Subject all projects and proposals to merit review process.
Advancement of Knowledge within the Nonproliferation R&D Community: Number of professional papers/exchanges presented-each representing Science and Technology knowledge and U.S. leadership in program areas.	250	200	200	200	200	200	200	Maintain scientific underpinnings of advanced R&D program.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Proliferation Detection	**128,012**	**126,127**	**111,544**

The Proliferation Detection program coordinates with other agencies the development of advanced remote sensing and ground-based technologies to address the most challenging problems related to detection, location, and analysis of the global proliferation of nuclear weapon technology, and the diversion of special nuclear materials. The program applies the unique facilities and scientific skills of laboratory scientists, in partnership with industry and academia, to address sensitive requirements and technical gaps identified through close interaction with users. Although the program has many near-term Advanced Concepts Technology Demonstration (ACTD)-like projects conducted in collaboration with other government agencies (i.e., IC, DOD, DHS, and law enforcement), these typically result from long-term fundamental science programs that are guided by knowledge of sensitive and classified nuclear weapons program information, operational strategies, and emerging national policies. The long-term scientific growth is enabled through sustained innovation and frequent interaction on real world problems caused by the threat of global proliferation in strategic WMD capability.

A goal of the Proliferation Detection program is to hand off technical know-how to the industrial and acquisition programs that support US national security programs and missions. Technical advances, new proven methodologies, and improvements to capabilities are transferred to operational programs through technical partnerships including developing special prototypes to assist major acquisition efforts. Partnerships with the industrial suppliers are often coordinated with user programs to facilitate successful outcomes.

The Remote Sensing focus area represents the nation’s core expertise in several fields, including remote chemical detection, synthetic aperture radar, and optical and radio frequency measurement and analysis. A specific accomplishment during FY 2005 will be the completion of payload integration for an advanced space demonstration of a detector with on-orbit processing related to proliferation applications. The payload will be manifested for launch by the Air Force space test program as launch schedules dictate.

The Nuclear and Radiological National Security Program focus area has core expertise in several fields, including nuclear forensic science, and advanced radiation detection. FY 2005 plans include demonstration of advanced mass spectrometry detector technology to improve proliferation detection, and feasibility assessment and sensor technology evaluation for attribution of nuclear weapons including improvised nuclear devices.

Total, Proliferation Detection	**128,012**	**126,127**	**111,544**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Nuclear Explosion Monitoring	**94,979**	**96,592**	**101,931**

The Nuclear Explosion Monitoring program builds the nation's operational treaty monitoring space sensors, produces and updates the regional geological datasets to enable operation of the nation's ground based treaty monitoring networks.

The satellite-based segment of the program builds three distinct sensors and two "support" packages for each Global Positioning System satellite. These packages constitute the Global Burst Detector payloads for monitoring atmospheric detonations. In addition to building the payloads, the program supports the integration, initialization and operation of these payloads. The satellite segment also supports the maintenance, integration and test of the previously built high altitude detection system payloads on the Defense Support Program satellites. The program conducts a limited amount of R&D to prepare the next generation sensors.

In FY 2005, the program will balance the multiyear production of GPS IIF payloads, support for the remaining GPS IIR payloads, and early design and development of GPS III payloads to best meet delivery timelines and requirements as launch schedules and on-orbit satellite health dictate.

A significant new effort (Space and Atmospheric Burst Reporting System) in the satellite-based program is the production of the follow-on high altitude-monitoring payload to replace the current system that will be retired by the US Air Force. This payload will satisfy recently revalidated requirements for monitoring upper atmosphere and space detonations. Production will ramp-up in FY 2005 to support Air Force specified launch schedules.

Ground-Based Systems provide classified, focused, applied research and engineering products integrated into a knowledge base, with appropriate testing, demonstration, and technical support for use by the Air Force in the U.S. National Data Center and U.S. Atomic Energy Detection System. NNSA has a memorandum of understanding with U.S. monitoring agencies to provide integrated state-of-the-art engineered systems for nuclear explosion monitoring. In FY 2005, the program will provide calibration data consistent with the installation of seismic stations. The NNSA ground-based systems integration function at the national laboratories will be supplied in part with products from research opportunities from open competition.

Increase due to new high-altitude monitoring payload for the Space and Atmospheric Burst Reporting System.

Total, Nuclear Explosion Monitoring	**94,979**	**96,592**	**101,931**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Supporting Activities	**10,037**	**9,278**	**6,525**

Supporting activities includes crosscutting costs of the Office of Nonproliferation Research and Engineering. These activities provide for strategic initiatives such as technology roadmapping and assessment, nonproliferation analysis and studies, and fund the Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs. Publication activities enhance communications between the technologists in the DOE community, policymakers, and the general public through vehicles such as the Arms Control and Nonproliferation Technologies Newsletter.

Decrease reflects Congressional earmark to provide the last year of funding to the Incorporated Research Institutions for Seismology PASSCAL Instrument Center was addressed in FY 2004.

Total, Supporting Activities	**10,037**	**9,278**	**6,525**

Chemical and Biological National Security Program	**23,064**	**0**	**0**

The Chemical and Biological National Security Program was transferred to the U.S. Department of Homeland Security in FY 2003.

Total, Chemical and Biological National Security Program	**23,064**	**0**	**0**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Proliferation Detection**	
FY 2004 specified program funding for development of chemical and biological detection sensors and biodefense presumed completion accounts for decrease	- 14,583
▪ **Nuclear Explosion Monitoring**	
Increase due to a significant new effort (Space and Atmospheric Burst Reporting System) in the satellite-based program to produce the follow-on high altitude-monitoring payload to replace the current system on the DSP satellites, which are being retired by the US Air Force (to be replaced by the Spaced-based Infrared (SBIRS) satellite system). This payload will satisfy recently revalidated requirements for monitoring upper atmosphere and space detonations. Production will ramp-up in FY05 to support Air Force-specified launch schedules. Although this effort requires an increase of $10 million to the satellite-based program, the requested increase has been offset due to the completion of Congressional earmarks to the ground-based program..	+ 5,339
▪ **Supporting Activities**	
Decrease reflects Congressional earmark to provide the last year of funding to the Incorporated Research Institutions for Seismology PASSCAL Instrument Center was addressed in FY 2004	- 2,753
Total Funding Change, Nonproliferation Verification R&D	- 11,997

Nonproliferation and International Security

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Nonproliferation and International Security					
Nonproliferation Policy.........	67,924	57,567	63,216	+ 5,649	+ 9.8%
Export Control......................	20,519	15,711	22,246	+ 6,535	+ 41.6%
International Safeguards.....	35,752	34,060	31,330	- 2,730	- 8.0%
Treaties and Agreements....	3,393	2,769	3,208	+ 439	+ 15.9%
International Emergency Management and Cooperation........................	3,285	3,977	4,000	+ 23	+ 0.6%
Total, Nonproliferation and International Security..................	130,873	114,084	124,000	+ 9,916	+ 8.7%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Nonproliferation and International Security...............	124,000	119,038	119,700	119,800	120,400	602,938

Description

The mission of the Office of Nonproliferation and International Security, as a complement to efforts under the Russian Transition Initiatives, is to detect, prevent, and reverse the proliferation of weapons of mass destruction (WMD) materials, technology, and expertise, and to strengthen the nonproliferation regime.

Benefits **to Program Goal 02.44.00.00 Nonproliferation and International Security and Goal 02.43.00.00 International Emergency Management and Cooperation**

This program, as a complement to efforts under the Russian Transition initiatives program, will detect and prevent the proliferation of WMD materials, technology and expertise to proliferant states or terrorists, and will strengthen the nonproliferation regime. Within the Nonproliferation and International Security program, five subprograms each make unique contributions to Program Goal 02.44.00.00. The Nonproliferation Policy subprogram administers the Reduced Enrichment Research and Test Reactor (RERTR), Russian Research Reactor Fuel Return (RRRFR), and Fuel Cycle Analysis activities, which are integral to the U.S. Government's HEU minimization policy. It also secures plutonium-bearing spent fuel in Kazakhstan, develops technical solutions to regional security problems, develops transparency and confidence-building measures to strengthen the nonproliferation regime, and provides support for nonproliferation and arms control policy-making. The Export Control subprogram secures technology by reviewing export license applications, and strengthens the nonproliferation regime by providing assistance to multilateral supplier organizations and improving foreign export control practices. The International Safeguards subprogram upgrades security of foreign materials, and strengthens the nonproliferation regime by providing support to the International Atomic Energy Agency (IAEA) and ensuring DOE compliance with IAEA safeguards. The Treaties and Agreements sub-program supports implementation of bilateral or multilateral, Presidentially-directed or Congressionally-mandated nonproliferation and international security requirements stemming from high-level initiatives, agreements and treaties. The International Emergency Management and Cooperation subprogram conducts information sharing and coordination with other foreign governments regarding emergency management cooperation and providing technical support for the multinational effort to permanently shutdown the BN-350 breeder reactor in Kazakhstan.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	Completed canning of BN-350 fast reactor spent fuel. (MET GOAL)	Developed and implement lab-to-lab counter-terrorism technology demonstrations at Russian technical institutes. (MET GOAL) Conducted field missions to North Korea to maintain status of spent fuel in the Nyongbyon spent fuel facility. (MET GOAL) Expanded cooperation with other states and U.S. Customs to improve export control capabilities. (MET GOAL) Developed verification capabilities to support implementation of the U.S.-Democratic Peoples Republic of Korea Agreed Framework. (MET GOAL)	Expedite the retrieval of spent nuclear fuel from Central Asia (MIXED RESULTS) Work with US Customs personnel to familiarize them with nuclear equipment, material, and technology, and to improve real-time analysis of suspect shipments. (MET GOAL) Expand bilateral physical protection visits, physical protection training, and the IAEA's International Physical Protection Advisory Service to help protect WMD facilities around the world against terrorist attack and sabotage. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative percentage of work completed on 98 targeted research and test reactor cores converted from HEU to LEU.**	Completed 39% of work to convert 98 targeted reactors. Completed design of suitable pin-type fuel for Russian-supplied research reactors.	Complete 42% of work to convert 98 targeted reactors.	Complete 45% of work to convert 98 targeted reactors.	Complete 51% of work to convert 98 targeted reactors.	Complete 55% of work to convert 98 targeted reactors.	Complete 59% of work to convert 98 targeted reactors.	Complete 70% of work to convert 98 targeted reactors.	Complete 100% of the 98 targeted reactors by 2013.
Annual number of safeguards or physical protection courses conducted.	Conducted five physical protection-training courses.	Conduct nine physical protection-training courses.	Conduct six courses on physical protection and one on Accounting and Control.	Conduct five physical protection-training courses.	Conduct three physical protection-training courses.	Conduct three physical protection-training courses.	Conduct three physical protection-training courses.	Ongoing.
Annual percentage of U.S. exports reviewed for proliferation concern. (EFFICIENCY MEASURE)	Reviewed 100% of U.S. nuclear-related transfers, and 50% of missile technology and chemical and biological-related exports.	Review 100% of U.S. nuclear-related transfers, and 60% of missile technology and chemical and biological -related exports.	Review 100% of U.S. nuclear-related transfers, and 70% of missile technology and chemical and biological-related exports.	Review 100% of U.S. nuclear-related transfers, and 80% of missile technology and chemical and biological -related exports.	Review 100% of U.S. nuclear-related transfers, and 90% of missile technology and chemical and biological -related exports.	Review 100% of U.S. nuclear-related transfers, and 100% of missile technology and chemical and biological -related exports.	Review 100% of U.S. nuclear-related transfers, and 100% of missile technology and chemical and biological -related exports.	Ongoing.
Cumulative number of cooperative agreement actions completed.	Administered 11 cooperative agreements, including sister-lab agreements, with foreign countries and organizations and complete 5 tasks.	Administer 19 cooperative agreements, including sister-lab agreements, with foreign countries and organizations and complete 15 tasks.	Complete an additional 10 tasks under active cooperative agreements for a total of 25 completed tasks.	Complete an additional 10 tasks under active cooperative agreements for a total of 35 completed tasks.	Complete an additional 10 tasks under active cooperative agreements for a total of 45 completed tasks.	Complete an additional 10 tasks under active cooperative agreements for a total of 55 completed tasks.	Complete an additional 10 tasks under active cooperative agreements for a total of 65 completed tasks.	Ongoing
Cumulative kilograms of HEU purchased and delivered.	Developed agreements for the HEU Research	Sign agreement. Purchase and deliver an	Purchase and deliver approximately 160kg HEU, for	Purchase and deliver approximately 160kg HEU, for	Purchase and deliver approximately 160kg HEU, for	Purchase and deliver approximately 160kg HEU, for	Purchase and deliver approximately 160kg HEU, for	1,500 kg of HEU by FY2014.

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
	Reactor Fuel Purchase and transportation arrangements.	estimated 177kg HEU.	a cumulative amount of 337 kg.	a cumulative amount of497 kg.	a cumulative amount of 657 kg.	a cumulative amount of 817 kg.	a cumulative amount of 977 kg.	

** In FY2003, the number of research and test reactors cores targeted to be converted from HEU to LEU significantly increased from 42 to 98.

Detailed Justification

Nonproliferation Policy	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
Reduced Enrichment Research and Test Reactor (RERTR)..	**6,352**	**8,860**	**9,965**

The Reduced Enrichment Research and Test Reactor (RERTR) program prevents proliferation of nuclear weapons by minimizing the use of highly enriched uranium (HEU) in civil nuclear programs worldwide. It develops the technologies needed to substitute low enriched uranium for HEU in research and test reactors, which use nearly all of the HEU in civil programs, without significant penalties in performance, economy, or safety. The FY 2005 base program will concentrate on development of new fuel types. The program is accelerating the development of LEU fuel for 5 large domestic HEU fueled research reactors. Each reactor will be converted as soon as appropriate, as LEU fuel becomes available. In addition, there are 19 large Russian-supplied research reactors that use up to 400 kilograms of HEU per year. RERTR funding is being provided for the development of appropriate LEU fuels to assist conversion of foreign HEU-fueled research reactors to LEU fuel.

Increase is due to the acceleration of RERTR in the development of LEU fuel for 5 large domestic HEU fueled research reactors.

Russian Research Reactor Fuel Return (RRRFR)	**9,520**	**9,691**	**9,866**

The Russian Research Reactor Fuel Return (RRRFR) program prevents proliferation of nuclear weapons by repatriating to Russia highly enriched uranium (HEU) fuel from Russian-supplied research reactors throughout the world.

Kazakhstan Spent Fuel Disposition...............................	**8,124**	**8,270**	**2,000**

The Kazakhstan Spent Fuel Disposition program prevents proliferation of nuclear weapons by securing the nearly three tons of weapons-grade plutonium in the BN-350 spent fuel at Aktau, Kazakhstan - enough material for hundreds of nuclear weapons. Under this cooperative program, the spent fuel assemblies have been stabilized, packaged in theft resistant canisters, and placed under IAEA safeguards. The program also seeks to provide long-term storage of the spent fuel in dual-use cask dry storage and provide physical protection support for all operations. The USG and the Republic of Kazakhstan have agreed on the approach using dual-purpose casks for both transportation and storage of the material. The USG has already decided through an NSC-led interagency process that this project should proceed because it protects our national security interests within the volatile Central Asia region. This project will design, procure, and conduct licensing of the casks. Much of the equipment required for the project is complex and must be custom designed. In addition, the design process is intricate and the lead-time for procurement is extensive.

Nonproliferation Policy	(dollars in thousands) FY 2003	FY 2004	FY 2005

Decrease made possible through the planned use of carry over funds ($23,000,000) to complete current stage of the Kazakhstan Spent Fuel Disposition project (i.e., design, fabrication and procurement of the dual-use storage and transportation cask).

Democratic People's Republic of Korea (DPRK)	**1,393**	**25**	**0**

Until last year, the Democratic People's Republic of Korea (DPRK) Spent Fuel Disposition program supported the disposition of weapons-grade plutonium-bearing spent fuel in stabilization canisters under continuous International Atomic Energy Agency monitoring in North Korea. This program worked for eight years to reverse and prevent further proliferation, and to reduce the immediate threat to U.S. national security interests posed by plutonium generated in DPRK nuclear weapons material production facilities. However, due to North Korea's revelation in October 2002 of a covert enrichment program, its decision to quit the Non-Proliferation Treaty, and to abandon IAEA safeguards, all work under this program has stopped.

Fuel Cycle Analysis..	**1,020**	**1,038**	**1,057**

The Fuel Cycle Analysis program includes nonproliferation assessments and proliferation resistant fuel cycle technology (PRFCT) policy and development. Nonproliferation assessments assist in the formulation of policy to minimize the use of weapons-usable materials and to identify opportunities to reduce proliferation risk in civil fuel cycle activities. PRFCT strengthens the nonproliferation regime through comparative analysis of existing and proposed fuel cycle technologies and reduces the long-term threat to U.S. national security by providing state-of-the-art tools to evaluate and improve proliferation resistant technology.

Global Regimes...	**4,285**	**4,562**	**5,141**

The Global Regimes program supports policy making, negotiations, and implementation regarding the following arms control and nonproliferation regimes: Nuclear Nonproliferation Treaty (NPT); Biological Weapons Convention (BWC); Chemical Weapons Convention (CWC); Threshold Test Ban Treaty (TTBT); Limited Test Ban Treaty (LTBT); fissile material production limits; and bilateral peaceful nuclear cooperation agreements. The program provides policy and technical expertise on such treaties and agreements and ensures that their negotiation and implementation meet U.S. national security and foreign policy objectives and can be implemented at DOE/NNSA National Laboratories and other facilities.

Regional Security	**8,660**	**8,307**	**8,756**

The Regional Security program covers the following regions: Middle East; South Asia; East Asia; and Central Asia. The program focuses on preventing the proliferation of weapons of mass destruction by developing technical solutions to regional security problems. The regional security program also provides a large portion of the funding for Sandia National Laboratories' Cooperative Monitoring Center (CMC).

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
Warhead Dismantlement and Fissile Material Transparency (WDT)	**16,150**	**15,814**	**16,431**

The Warhead Dismantlement and Fissile Material Transparency (WDT) program promotes transparent nuclear reductions by providing confidence that Russian nuclear weapons are being dismantled and that excess fissile materials, including those removed from dismantled Russian nuclear weapons, are not used in the production of new nuclear weapons. The Program evaluates initiatives that might include the monitoring of nuclear warheads, nuclear warhead dismantlement, and studies technologies to support such efforts. It also develops methodologies that could be used for warhead and fissile material transparency, and comprehensively evaluates the issues associated with potential monitoring regimes. Additionally, the WDT program evaluates technologies based on transparency initiatives that could also be used to combat nuclear-related terrorism (e.g., nuclear material detectors). The WDT program consists of the following:

- U.S.-Russian Federation Plutonium Production Reactor Agreement (PPRA) policy and monitoring implementation,
- U.S.-Russian Federation Warhead Safety and Security Exchange (WSSX) Agreement,
- U.S.-Russian Federation Highly Enriched Uranium (HEU) Purchase Agreement Transparency policy,
- START I and Treaty of Moscow implementation and future arms control and nonproliferation initiatives (SFAC).

	FY 2003	FY 2004	FY 2005
HEU Research Reactor Fuel Purchase	**12,420**	**1,000**	**10,000**

Purchase on average 160 kg per year of Russian HEU per year to be used to manufacture fuel for four U.S. HEU-fueled research reactors (one DOE, one NIST, and two university reactors). The Russian HEU would be shipped to the NNSA Y-12 plant for interim storage pending shipment to the U.S. fuel manufacturer. The majority of the program funds will be provided to the Russian Federation for HEU purchase. Project management will be supported through Oak Ridge, Y-12 plant and BWXT contractor. While it is U.S. policy to minimize civil HEU use, HEU fuel is required for approximately the next 10 years, until LEU fuel is developed for these research reactors under the DOE Reduced Enrichment for Research and Test Reactors (RERTR) program. HEU purchases for research reactor fuel will be coordinated with the RERTR program and discontinued once reactors are converted.

Funding in FY 2003 provided for the program set-up and purchase of 177kg of HEU in FY 2004.

Increase reflects the cost to secure the second purchase of HEU research reactor fuel from Russia.

	FY 2003	FY 2004	FY 2005
Total, Nonproliferation Policy	**67,924**	**57,567**	**63,216**

Export Control	(dollars in thousands) FY 2003	FY 2004	FY 2005
Export Control Operations	**12,119**	**12,269**	**15,341**

Export Control Operations includes domestic licensing and multilateral activities.

Licensing Operations reviews and provides advice and recommendations on U.S. license applications for dual-use items and munitions that could have use in the development of nuclear, chemical, and biological weapons and delivery systems. For this purpose, the program maintains the Proliferation Information Network System, an automated, classified system for the review and assessment of dual-use licenses. As provided under law, the Export Control program participates in interagency license review groups, including Advisory Committee on Export Policy, the Operating Committee, the Sub-Group on Nuclear Export Controls, the Missile Technology Export Group, and Shield (chemical and biological technologies). The program interacts closely with the Departments of Commerce, State and Defense in updating with U.S. export control lists, including the "Nuclear Referral List," which identifies nuclear dual-use items requiring special attention, such as special metals, high-speed cameras, and sensitive electronic equipment, and cooperates with Customs (Department of Homeland Security) in the area of export control enforcement through workshops and analysis identifying proliferation-sensitive commerce and reviewing suspicious shipments for proliferation risk. Another major area of responsibility is administration of Secretarial authorizations for the transfer of U.S. nuclear technology, as provided under the Atomic Energy Act and the implementing regulations in 10 CFR Part 810, and supports a range of activities to promote export control compliance across the DOE complex.

The Multilateral Program provides technical and policy support to U.S. Government diplomacy involving the Nuclear Suppliers Group, the Non-Proliferation Treaty Exporters' (Zangger) Committee, and the Missile Technology Control Regime, each of which formulates internationally-agreed upon definitions of materials and commodities and export control practices. The Multilateral Program draws on the unparalleled technical expertise in DOE national labs and is a recognized international leader in the area of nuclear export controls. The program developed and operates a state-of-art NSG Information Sharing System, a secure internet based system that allows Nuclear Suppliers Group members to share information on license denials, provides technical support to regime members, and engages in outreach activities with supplier and transit states to stress the importance of compliance with multilateral standards of conduct. Finally, under the Proliferation Risk and Analysis Project, the program conducts technical proliferation assessments to identify export control vulnerabilities and critical technology needs of countries of proliferation concern.

Increase will broaden scope of program beyond FSU and assist other USG agencies in these capabilities.

International Nonproliferation Export Control Program	**8,400**	**3,442**	**6,905**

The International Nonproliferation Export Control Program (INECP) works with partner governments in Russia, the New Independent States (NIS), South Asia, the Middle East, and East Asia to strengthen national systems of international nonproliferation export control in countries and regions of proliferation concern. The program targets established and emerging suppliers and high-traffic transit nations. Increase of funds in FY 2005 for INECP will enable the program to accelerate on-going assistance in Russia, Ukraine, Kazakhstan, the Baltics, the Caucasus, and Uzbekistan, and to expand assistance in the Middle East, South Asia, East Asia, and initiate assistance in Central Asia, the Balkans, and South America.

Increase in Export Control will help establish and strengthen competent export control authorities in foreign countries beyond the former Soviet Union, particularly emerging supplier states and critical transshipment states in the Middle East, South Asia, and East Asia. In addition, the increase will enable the program to assist other USG agencies, particularly the new Department of Homeland Security, to strengthen our own capability to identify proliferation-sensitive commerce and review suspicious shipments for proliferation risk.

Total, Export Control	**20,519**	**15,711**	**22,246**

International Safeguards	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
IAEA Safeguards and Nonproliferation Policy Support..	**12,393**	**15,697**	**10,600**

The International Safeguards program provides policy and technical leadership to strengthen the nuclear nonproliferation regime, particularly through efforts to strengthen IAEA safeguards and to promote global nuclear security. The program develops policy and provides new safeguards approaches and technologies, such as environmental sampling and remote monitoring, to enable the IAEA to detect clandestine nuclear activities and to safeguard declared nuclear material. (These approaches and technologies will support implementation of IAEA "strengthened safeguards" globally, while specialized tools developed under the "Nuclear Noncompliance Verification" budget item will be tailored to address the unique problems posed by specific proliferant states). The International Safeguards program also provides policy and technical assistance to support application of IAEA safeguards at DOE/NNSA sites (including inspections of excess material and preparations to implement the IAEA Additional Protocol), and with Russia and the IAEA to develop and implement new verification arrangements for excess materials.

The reduction in funding levels reflects the transfer of international physical protection activities, including bilateral cooperation and multilateral assistance through the IAEA, to a new activity that includes both the international physical protection work and cooperation on nuclear materials security. That program, referred to as Global Nuclear Security, is discussed below.

International Cooperation...	**11,604**	**5,196**	**5,500**

DOE/NNSA reduces the threat of nuclear proliferation through the negotiation and implementation of cooperative agreements and arrangements that support Non-Proliferation Treaty (NPT) goals, promotion of effective safeguards and physical protection of nuclear materials. The International Cooperation program transfers advanced technology applications for IAEA strengthened safeguards and enhanced physical protection of nuclear material through bilateral safeguards cooperation agreements. The program promotes the peaceful application of nuclear technology through bilateral "Sister Laboratory" arrangements in support of U.S. treaty obligations under the NPT. The program also supports the nonproliferation regime through planning and preparations for the NPT Review Conferences.

Nuclear Noncompliance Verification............................	**9,436**	**6,000**	**6,000**

The objectives of work to be performed under this heading are to detect undeclared nuclear programs around the world and to verify the dismantlement of those programs. These Nuclear Noncompliance Verification activities must be done largely by the International Atomic Energy Agency (IAEA), and, furthermore, can be done only with specially designed tools and technologies that are still being developed. The requested funding will enable development of those tools, with emphasis on detection and verification of plutonium programs.

International Safeguards	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
Global Nuclear Security	**2,319**	**7,167**	**9,230**

For FY 2005, the name of this program area has changed. Although the U.S. has been actively engaged in various global nuclear security efforts since 1974, the programs have recently been reorganized to form the Global Nuclear Security Program (GNSP). The GNSP aims to improve nuclear security systems in all non-weapons states. The GNSP is working cooperatively with governments worldwide and the International Atomic Energy Agency (IAEA) to strengthen physical protection measures at nuclear facilities. The program exercises its mandate through the following projects:

This program provides technical personnel to the IAEA to lead and/or support International Physical Protection Advisory Service (IPPAS) Missions. IPPAS was established by the IAEA in 1996 to assist Member States in the evaluation and improvement of their physical protection systems. Many of these missions lead to recommendations for, and implementation of, additional security upgrades.

The program ensures that countries possessing U.S.-origin nuclear material are adequately protected against theft, sabotage and nuclear smuggling. As codified in the 1978 Atomic Energy Act, the U.S. must ensure that there is adequate security for U.S.-origin nuclear material provided to other countries for peaceful purposes. Approximately 5 visits are conducted per year by the program.

Upgrades are also provided on a bilateral basis based on recommendations from IPPAS mission, U.S. bilateral visits, and the results of the NNSA’s Global Research Reactor Security Initiative (GRRSI). The program is currently engaged in providing nuclear security assistance on a bilateral basis to countries including Kazakhstan, Romania, Indonesia, Bulgaria, Czech Republic, Hungary, Latvia, Lithuania, Serbia, Belarus, Poland, Ukraine, Greece, Uzbekistan and Portugal.

Upon completion of security upgrades in these countries, the responsibility for sustaining the systems will be transitioned away from bilateral assistance to the states themselves. In the case of countries of the NIS/Baltics region, this will be accomplished with assistance provided as needed through the IAEA’s nuclear materials security program.

The program is also actively engaged in training students from throughout the world in nuclear security topics. Training includes the biannual International Training Course, several Regional Training Courses in countries such as the Czech Republic, China, Brazil, Australia and Mexico, and other international courses including Security System Design and Analysis, Design Basis Threat, Insider Analysis, and Vital Area Identification.

The reduction in the funding level for International Safeguards reflects the one-time funding increase in fiscal year 2004 for initiatives to remove nuclear weapons-usable material from vulnerable sites around the world.

Total, International Safeguards.....................................	**35,752**	**34,060**	**31,330**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Treaties and Agreements	**3,393**	**2,769**	**3,208**

The Treaties and Agreements sub-program supports implementation of bilateral or multilateral, Presidentially-directed or Congressionally-mandated nonproliferation and international security requirements stemming from high-level initiatives, agreements and treaties. In addition, it provides for unexpected, unplanned responses to requirements of an immediate nature based on unanticipated U.S. national security needs. Examples of recent accomplishments of this program are:

- Certification of a second Chemical Weapons Convention analytical laboratory (a U.S. Senate mandate arising from the advice and consent process)
- Funding a joint US-Russian counter-terrorism conference
- Funding a regional seminar to improve export control practices in Central Asia and the Caucasus
- Funding to provide WMD training to the Federal Law Enforcement Training Center, to support Shield America (chemical and biological technologies), and to create an export control end-user/end-use directory to speed up and systematize license reviews.

Increase in Treaties and Agreements due to minor internal readjustments to compensate for major reduction in prior fiscal year, and to position program to better respond to time-critical issues of an emergent nature.

Total, Treaties and Agreements	**3,393**	**2,769**	**3,208**

International Emergency Management and Cooperation	(dollars in thousands) FY 2003	FY 2004	FY 2005
Kazakhstan BN-350 Reactor Shutdown	**1,000**	**1,491**	**1,500**

Provide technical support for the multinational effort to permanently shutdown the BN-350 breeder reactor in Kazakhstan. The deactivation of this facility, which will be completed in fiscal year 2006, eliminates a source of fissile material production in Central Asia. Draining the sodium coolant and processing the coolant into an environmentally safe material will accomplish the elimination of the source of fissile material production. Sodium is both flammable and explosive, and the coolant in the BN-350 reactor also contains significant levels of radioactive cesium.

In FY04, the program will conclude the sodium draining process, complete the final design of the Sodium Processing Facility (SPF), and initiate construction. In FY05, proceed with SPF construction by installing process tanks and piping.

International Emergency Management	**2,285**	**2,486**	**2,500**

Conduct information sharing and coordination with other foreign governments regarding emergency management cooperation. Current ongoing cooperation is predominately with Japan, France, S. Korea, Finland, Armenia, Sweden, Norway, Russia, and Ukraine. Continue liaison with and participation in international organizations (IAEA, Nuclear Energy Agency, EU, NATO, G8, Arctic Council, and the U.N.), exhibiting leadership, under assistance and cooperation agreements to provide effective early warning and notification, and consistent emergency plans and procedures. Research, document, and harmonize differences between worldwide plume modeling and dispersion programs developed by the Atmospheric Release Advisory Capability, Japan's WSPEEDI, EU's RODOS, and Russia's ROSHYDROMET. Integrate the Atmospheric Release Advisory Capability (ARAC) plume modeling and graphic information system into other systems (Japan's WSPEEDI, the European Union's RODOS) for a worldwide capability for nuclear/radiological incidents.

Support IAEA with radiation detectors and technical assistance for their emergency program and to address lost sources. Support emergency response cooperative activities between U.S. and Russia (EMERCOM, Ministry of Atomic Energy, Ministry of Health) protecting the public and the environment from the consequences of nuclear/radiological incidents in Russia. Assist Russia's Minatom in the development of emergency management procedures to enhance its Situation and Crisis Center network. Conduct emergency tabletop drills and exercises involving nuclear facility workers and local and national government counterparts. Develop and conduct three training courses for nuclear facility emergency staff in Russia.

Increase will support the IAEA with radiation detectors and technical assistance for emergency programs.

Total, International Emergency Management and Cooperation	**3,285**	**3,977**	**4,000**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
Nonproliferation Policy	
Increase reflects the cost to secure the second purchase of HEU research reactor fuel from Russia. The first purchase utilized FY 2003 appropriated funds, so this increase largely reflects restoration of the program request to the level needed to support annual planned funding requirements partially offset by the decrease in the Kazakhstan Spent Fuel Disposition project using prior year balances to complete current activities	+ 5,649
Export Controls	
Increase will help establish and strengthen competent export control authorities in foreign countries beyond the former Soviet Union, particularly emerging supplier states and critical transshipment states in the Middle East, South Asia, and East Asia. In addition, the increase will enable the program to assist other USG agencies, particularly the new Department of Homeland Security, to strengthen our own capability to identify proliferation-sensitive commerce and review suspicious shipments for proliferation risk	+ 6,535
International Safeguards	
The reduction in the funding level reflects the one-time funding increase in fiscal year 2004 for initiatives to remove nuclear weapons-usable material from vulnerable sites around the world	- 2,730
Treaties and Agreements	
Increase due to minor internal readjustments to compensate for major reduction in prior fiscal year, and to position program to better respond to emerging time-critical issues.	+ 439
International Emergency Management and Cooperation	
Increase will provide the IAEA with radiation detectors and technical assistance for emergency programs	+ 23
Total Funding Change, Nonproliferation and International Security	+ 9,916

International Nuclear Materials Protection and Cooperation

Funding Schedule by Activity [a]

(dollars in thousands)

	FY 2003[b]	FY 2004	FY 2005	$ Change	% Change
International Nuclear Materials Protection and Cooperation					
Navy Complex............................	24,156	38,000	15,000	- 23,000	- 60.5%
Strategic Rocket Forces.............	8,965	24,000	45,000	+ 21,000	+ 87.5%
MinAtom Weapons Complex......	42,634	32,487	43,000	+ 10,513	+ 32.4%
Civilian Nuclear Sites..................	13,646	16,000	14,000	- 2,000	- 12.5%
Material Consolidation and Conversion................................	12,082	32,000	30,000	- 2,000	- 6.3%
Radiological Dispersal Devices.....................................	47,963	36,000	25,000	- 11,000	- 30.6%
National Programs and Sustainability..............................	44,439	28,000	27,000	- 1,000	- 3.6%
Second Line of Defense.............	139,144	52,000	39,000	- 13,000	- 25.0%
Total, International Nuclear Materials Protection and Cooperation......................................	333,029	258,487	238,000	- 20,487	- 7.9%

[a] FY 2003 Includes $ 2.194 million for Nuclear Nuclear Assessment Program expended prior to transfer of the program to the Department of Homeland Security on March 1st 2003.

[b] Reflects $106.0 million from FY 2003 emergency supplemental funding contained in Public Law 108-11.

Public Law Authorization and Other Agreements:
Public Law 108-136, National Defense Authorization Act for FY 2004

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
International Nuclear Materials Protection and Cooperation.......	238,000	244,000	250,000	258,000	259,818	1,249,818

Description

The program prevents nuclear terrorism by working in Russia and other regions of concern to (1) secure and eliminate vulnerable nuclear weapons and weapons-usable material; (2) locate, consolidate and secure radiological materials that can be used in a dirty bomb; and (3) install detection equipment at border crossings and selected seaports, termed Mega-Seaports to prevent and detect the illicit transfer of nuclear material.

Benefits to Program Goal 02.46.00.00 International Nuclear Materials Protection and Cooperation

Within the International Nuclear Materials Protection and Cooperation program, 8 subprograms each make unique contributions to Program Goal 02.46.00.00. The Navy Complex program element improves security of Russian Federation (RF) Navy weapons usable material by installing improved security systems at RF Navy nuclear warhead sites, RF Navy HEU fuel storage facilities (fresh and damaged fuel), and shipyards where nuclear materials are present. These activities comprise a total of 50 sites: 39 Russian Navy nuclear warhead sites and 11 Russian Navy fuel and other nuclear material storage sites. The Strategic Rocket Forces (SRF) program element improves security of Russian Federation (RF) warheads by installing improved MPC&A systems at RF Strategic Rocket Forces nuclear warhead sites. A total of 14 sites at 12 bases have been approved by the U.S. Government for MPC&A upgrades. Discussions are underway to include additional sites.

The MinAtom Weapons Complex program element enhances U.S. national security by providing MPC&A upgrades to the RF MinAtom nuclear weapons, uranium enrichment, and material processing/storage sites. The MinAtom Weapons Complex, located in closed cities and comprise a total of 9 sites. These sites account for approximately 500 MTs of highly attractive weapons-usable nuclear materials.

The Civilian Nuclear Sites program element installs MPC&A systems at 31 civilian nuclear sites (18 Russian and 13 Non-Russian). The civilian sites contain approximately 40 MTs of the most vulnerable material of proliferation concern.

The Material Consolidation and Conversion (MCC) program element reduces the complexity and the long-term costs of securing weapons-usable nuclear material. The MCC project is designed to significantly reduce the proliferation risk associated with weapons-usable nuclear materials by consolidating excess, non-weapons highly enriched uranium and Pu into fewer, more secure locations.

The Radiological Dispersion Devices (RDD) program element identifies and pursues actions that can be taken to reduce the threat of a radiological attack against the United States. The National Programs and Sustainability program element enables the MPC&A program to implement an exit strategy by helping partner countries, particularly the Russian Federation (RF), establish and implement national and other infrastructure components.

The Second Line of Defense (SLD) program deploys radiation detection monitors at strategic transit and border crossings and at air and sea transshipment hubs in Russia and other countries to provide these governments with the technical means to deter and interdict illicit trafficking in nuclear and other radioactive materials. NNSA is pursuing cooperation with international partners to deploy and equip key ports with radiation detection equipment and to provide training to appropriate law enforcement officials, in order to provide them the technical means to deter and interdict illicit trafficking in nuclear and other radioactive materials.

Program Assessment Rating Tool (PART)

In FY 2004 OMB evaluated the MPC&A program using the PART tool. The MPC&A program achieved a perfect score on purpose and design because it has a clear purpose that addresses a specific need. It also achieved a perfect score in strategic planning because the Department has established specific, measurable goals and time frames. OMB has therefore assigned to this program its highest rating of "Effective". In addition, MPC&A provided OMB an FY 2005 update to its FY 2004 PART.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	Accelerate the rapid and comprehensive upgrades on at-risk plutonium, highly enriched uranium, and Naval nuclear weapons. (MET GOAL)	Install MPC&A upgrades on nuclear weapons and materials, eliminate weapons-usable materials, and consolidate the number of storage locations for weapons-usable materials into fewer buildings and sites to improve security in Russia. (MIXED RESULTS)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percentage of 39 Russian Navy warhead sites secured.	Secured 77% of the 39 Russian Navy warhead sites.	Secure 85% of the 39 Russian Navy warhead sites.	Secure 97% of the 39 Russian Navy warhead sites.	Secure 100% of the 39 Russian Navy warhead sites.				Secure 100% of the 39 Russian Navy warhead sites by the end of 2006.
Percentage of 25 Russian Strategic Rocket Forces sites secured.	Initiated MPC&A upgrades at 16% of the 25 Russian Strategic Rocket Forces sites.	Secure 8% of the 25 Russian Strategic Rocket Forces sites.	Secure 12% of the 25 Russian Strategic Rocket Forces sites.	Secure 48% of the 25 Russian Strategic Rocket Forces sites.	Secure 76% of the 25 Russian Strategic Rocket Forces sites.	Secure 100% of the 25 Russian Strategic Rocket Forces sites.		Secure 100% of the 25 Russian Strategic Rocket Forces sites by the end of 2008.
Percentage of 600 MTs of weapons-usable nuclear material secured.	Secured 22% of the 600MTs of weapons-usable nuclear material.	Secure 26% of the 600MTs of weapons-usable nuclear material.	Secure 37% of the 600MTs of weapons-usable nuclear material.	Secure 50% of the 600MTs of weapons-usable nuclear material.	Secure 73% of the 600MTs of weapons-usable nuclear material.	Secure 100% of the 600MTs of weapons-usable nuclear material.		Secure 100% of the 600MTs of weapons-usable nuclear material by the end of 2008.
Percentage of 27 MTs of HEU converted to LEU.	Converted 16.1% of the 27 MTs of HEU to LEU.	Convert 24% of the 27 MTs of HEU to LEU.	Convert 31% of the 27 MTs of HEU to LEU.	Convert 38% of the 27 MTs of HEU to LEU.	Convert 46% of the 27 MTs of HEU to LEU.	Convert 53% of the 27 MTs of HEU to LEU.	Convert 61% of the 27 MTs of HEU to LEU.	Convert 100% of the 27 MTs of HEU to LEU by the end of 2015.
Cumulative number of Radiological Dispersal Devices (RDD) sites secured.	Secured a total of 8 RDD sites.	Secure a total of 35 RDD sites.	Secure a total of 99 RDD sites.	Secure a total of 149 RDD sites.	Secure a total of 199 RDD sites.	Secure a total of 249 RDD sites.	Secure a total of 299 RDD sites.	

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative number of Second Line of Defense (SLD) sites with nuclear detection equipment installed.	Installed radiation detection equipment at 39 sites.	Install radiation detection equipment at 74 sites., (including 3 MegaPorts)	Install radiation detection equipment at 97 sites, (including 6 MegaPorts).	Install radiation detection equipment at 118 sites, (including 7 MegaPorts).	Install radiation detection equipment at 139 sites, (including 8 MegaPorts).	Install radiation detection equipment at 181 sites, (including 10 MegaPorts).	Install radiation detection equipment at 241 sites, (including 15 MegaPorts).	Install radiation detection equipment at 293 border crossing sites and 20 Mega-Ports (assuming no expansion of program sites) by the end of 2012.
Annual percentage of buildings scheduled for completion of security upgrades in a year that are done on time. (EFFICIENCY MEASURE)	Completed security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	Complete security upgrades on 100% of the buildings scheduled for this fiscal year.	

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Navy Complex	**24,156**	**38,000**	**15,000**

The Navy Complex program element improves security of Russian Federation (RF) Navy weapons usable material by installing improved security systems at RF Navy nuclear warhead sites, RF Navy HEU fuel storage facilities (fresh and damaged fuel), and shipyards where nuclear materials are present. These activities comprise a total of 50 sites, 39 Russian Navy nuclear warhead sites and 11 Russian Navy fuel and other nuclear material storage sites. These sites account for approximately 60 MTs of highly attractive weapons-usable nuclear materials and hundreds of at-risk RF Navy nuclear warheads. The Navy Complex has refined the process of working with the RF Navy which includes upgrades design driven by vulnerability assessments (VAs), a rapid upgrades phase that is typically completed within six months, a comprehensive upgrades phase requiring 12-18 months to complete and a sustainability program which assures the systems will remain effective after the installation of upgrades is complete.

Complete MPC&A upgrades at an additional 12% (5 sites) of the 39 Russian Navy nuclear warhead sites (increasing the total warhead sites secured (with either completed rapid and/or comprehensive upgrades) to 97% (38 sites)). Comprehensive upgrades will begin at the remaining Russian Navy warhead site. These upgrades will include physical protection and material control enhancements to Russian Navy sites that store or handle nuclear warheads. Upon completion of these upgrades, sustainability activities will begin at these warhead sites.

MPC&A comprehensive upgrades were completed on 100% of the 11 Navy fuel and other nuclear material storage sites in FY 2004, no new work is planned at those sites. However, sustainability and training efforts will continue to ensure that equipment provided is effective in protecting the material.

Decrease due to the completion of either rapid or comprehensive upgrades at a vast majority (85%) of Russian Navy warhead sites in FY 2004 and the transition to sustainability activities.

	FY 2003	FY 2004	FY 2005
Total, Navy Complex	**24,156**	**38,000**	**15,000**
Strategic Rocket Forces..	**8,965**	**24,000**	**45,000**

The Strategic Rocket Forces (SRF) program element improves security of Russian Federation (RF) warheads by installing improved MPC&A systems at RF Strategic Rocket Forces nuclear warhead sites. Fourteen sites at 12 bases have been approved by the U.S. Government for MPC&A upgrades. Discussions are underway to include additional sites. For planning purposes, NNSA is assuming that approximately 25 SRF nuclear warhead sites will require upgrades. The process for working with the SRF will be based upon the refined process currently in place with the Russian Navy, which includes upgrades design driven by vulnerability assessments (VAs), a rapid upgrades phase is often completed within six-eight months, a comprehensive upgrades phase, and a sustainability program, which assures the systems will remain effective after the installation of upgrades is complete.

(dollars in thousands)

In FY 2005, NNSA plans to complete MPC&A upgrades at an additional 4% (1 site) of the approximately 25 SRF sites, (increasing the total SRF sites secured (with either completed rapid and/or comprehensive upgrades) to 12% (3 sites)). Complete MPC&A rapid upgrades at 4 of the approximately 25 SRF sites (increasing the total sites completed to14) and initiate MPC&A comprehensive upgrades at 7 sites.

Increase due to the initiation of MPC&A comprehensive upgrades 3 additional sites over the FY 2004 level.

	FY 2003	FY 2004	FY 2005
Total, Strategic Rocket Forces......................................	**8,965**	**24,000**	**45,000**
MinAtom Weapons Complex..	**42,634**	**32,487**	**43,000**

The MinAtom Weapons Complex program element enhances U.S. national security by providing MPC&A upgrades to the RF MinAtom nuclear weapons, uranium enrichment, and material processing/storage sites. The MinAtom Weapons Complex, located in closed cities, comprises a total of 9 sites. These sites account for approximately 500 MTs of highly attractive weapons-usable nuclear materials. The goal of this joint cooperative program is to identify areas that handle highly attractive material and provide protection against both internal and external threat scenarios.

Complete MPC&A rapid upgrades on an additional 20% of nuclear material (increasing the total amount of nuclear material rapid upgrades to 55%). Complete MPC&A comprehensive upgrades on an additional 14% of nuclear material (increasing the total amount of nuclear material under comprehensive upgrades to 25%).

At Mayak, continue MPC&A upgrades at the RT-1 fuel reprocessing plant and several sensitive areas within Plant 20. Comprehensive physical protection and material control and accounting upgrades at Mayak Plant 20 will continue immediately after the final list of proliferation vulnerabilities have been identified and the MPC&A system designs are completed. Upgrades and sustainability for Protective Force and secure transportation will continue.

At Tomsk-7, comprehensive physical protection and material control and accounting upgrades will continue at the Conversion Plant, Uranium Enrichment Plant, and the Chemical Metallurgical Plant.

At Krasnoyarsk-26, construction of the new Plutonium storage facility will continue and implementation of the new physical protection and material accounting systems will be in progress. Related upgrades include the completion of a central alarm station and implementation of complex-wide material accounting measurements to verify the nuclear material inventory.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

At Arzamas-16, expand on-going activities to include several new guarded areas. Continue construction of the central storage facility to consolidate material on site. Begin repackaging of the nuclear material to be transferred into the new central storage facility once completed.

At Chelyabinsk-70, expand on-going activities to include several new areas. Continue construction of the central storage facility to consolidate material on site. Begin repackaging of the nuclear material to be transferred into the new central storage facility once completed.

Initiate MPC&A upgrades at one of the remaining two MinAtom Weapons Complex sites.

Continue sustainability activities at Sverdlovsk-44 and Kransnoyarsk-45.

The serial production enterprises (SPEs) of MinAtom contain a significant portion of the nuclear material residing in the Russian weapons complex. Given the extreme national security sensitivity of these sites for the Russian Federation, Minatom has not yet permitted security upgrades at these sites. The goal of NNSA is to continue to pursue a dialogue with MinAtom until a mutually acceptable mechanism for improving material security at the SPEs can be identified and implemented.

Increase due to start of MPC&A rapid/comprehensive upgrades to additional areas within 3 sites.

Total, MinAtom Weapons Complex.............................	**42,634**	**32,487**	**43,000**
Civilian Nuclear Sites	**13,646**	**16,000**	**14,000**

The Civilian Nuclear Sites program element installs MPC&A systems at 31 civilian nuclear sites (18 Russian and 13 Non-Russian). The civilian sites contain approximately 40 MTs of vulnerable, material of proliferation concern. The basic MPC&A upgrade objective is to employ a cost-effective, graded approach with an initial focus on installing MPC&A upgrades on the most highly attractive nuclear material at each site. Rapid MPC&A upgrades are installed to mitigate the immediate risk of theft and diversion while longer term, more comprehensive MPC&A upgrades are designed, installed and placed into operation. Following completion of site upgrades, U.S. support continues to help foster site capabilities to operate and maintain installed security systems. This line item will cover sustainability support for those sites with completed MPC&A comprehensive upgrades.

Complete MPC&A comprehensive upgrades on an additional 1% of nuclear material (increasing the total amount of nuclear material under comprehensive upgrades to 99%). Complete MPC&A comprehensive upgrades at Bochvar, (increasing the total number of sites completed to 17 of the 18 Russian sites and 13 of the 13 FSU sites). Continue upgrades at the Elektrostal Machine Building Plant and complete MPC&A comprehensive upgrades by the end of FY 2006. Provide support for training, procedures, maintenance, equipment repair, critical spare parts, and performance testing to the sites with completed MPC&A upgrades in order to ensure the sustainability of installed MPC&A upgrades.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Conduct MPC&A cooperation with countries outside of Russia and the former Soviet States. Planned activities include technical exchanges and rapid MPC&A upgrades to sites with weapons usable nuclear materials, which are most vulnerable to theft and/or diversion.

Decrease due to the initiation and ramp-up of MPC&A cooperation with countries outside of Russia and the former Soviet States begun in FY 2004.

Total, Civilian Nuclear Sites	**13,646**	**16,000**	**14,000**
Material Consolidation and Conversion.......................	**12,082**	**32,000**	**30,000**

Material Consolidation and Conversion (MCC) program element reduces the complexity and the long-term costs of securing weapons-usable nuclear material. The MCC project is designed to significantly reduce the proliferation risk associated with weapons-usable nuclear materials by consolidating excess, non-weapons highly enriched uranium and Pu into fewer, more secure locations. This decreases the number of attractive theft targets and the equipment and personnel costs associated with securing such material. MCC also converts weapons-usable material (HEU and Plutonium) to less proliferant-attractive form, which reduces its attractiveness to would-be proliferators. By the end of FY 2015, it is planned that the MCC project will convert ~27 MTs of HEU to LEU. Based on its consolidation and conversion activity, the MPC&A program plans to have removed all proliferation concern material from 55 buildings.

Continue to implement MPC&A strategy to simplify the nuclear security situation in Russia by consolidating material to fewer sites and fewer buildings, and converting much of this material to less proliferant attractive form (i.e. HEU to LEU), rendering it less attractive to would-be proliferators. Convert an additional 7% (2 MTs) of the total 27 MTs of weapon-grade highly enriched uranium to be converted to non-weapons grade low enriched uranium,(for a total percentage converted of 31%, (8.4 MTs)). Clear an additional 5% (3 buildings) of the 55 buildings to be cleared of all weapons-usable material consolidating it to other secured buildings (increasing the total percentage of buildings cleared to 60%, (33 buildings)).

Decrease due to a slight decrease in the number of buildings scheduled to be cleared of all weapons-usable material and no funding for accelerated MCC until additional HEU that could be available for conversion to LEU is known.

Total, Material Consolidation and Conversion............	**12,082**	**32,000**	**30,000**
Radiological Dispersal Devices	**47,963**	**36,000**	**25,000**

The Radiological Dispersion Devices (RDD) program element identifies and pursues actions that can be taken to reduce the threat of a radiological attack against the United States. Given the large number of radiological sources and facilities storing these materials world-wide, the RDD program is continuing to refine a prioritization of those materials which pose the greatest risk. Also, considered are threat environment and impacts on U.S. National security. The RDD program security upgrades will be based upon similar methodology used by the MPC&A program to design security enhancements for nuclear warheads and weapons-usable nuclear material.

(dollars in thousands)

As candidate RDD sites and orphan or surplus radioactive sources are identified, the RDD Program installs a suite of physical security and material control and accounting upgrades that will significantly enhance the protection of nuclear material at the site to an acceptable level. These upgrades may include: installation of vehicle inspection areas; hardened access control and guard buildings; detection, assessment, and access control systems; exterior access delay systems; and additional response force upgrades if necessary. In FY 2005, the RDD program plans to complete the installation of equipment to secure radiological materials at an additional 64 RDD sites, (increasing the total number of sites secured to 99). A larger number of sites can be completed in FY 2005 than in FY 2004 at a lower funding level since these sites are much smaller and lower cost to compete than the Russian RADON sites. The Program also seeks to recover and dispose of the sources from 100 radio isotope thermal electric generators or sites containing disused/abandoned radiological sources in FY 2005 and each year thereafter.

Provide the IAEA's Office of Nuclear Security funding to support a globalization Initiative between the U.S., the IAEA, and other members states to secure vulnerable high risk radioactive sources. This funding will focus on developing countries worldwide where the security of radioactive sources needs improvement or is non-existent. The IAEA's Office of Nuclear Security will be tasked to provide the NNSA with the necessary technical, management and administrative assistance to locate, consolidate, transport, secure in storage, or securely dispose of, these high risk sources to reduce the risk of them being used to perpetrate malicious acts.

In response to the need to improve the security of research reactors and other such facilities throughout the world where nuclear and non-nuclear radiological material may be co-located NNSA launched the Global Research Reactor Security Initiative. If not adequately protected, such facilities could be vulnerable to sabotage, theft, or attack. The mission of the Global Research Reactor Security Initiative (GRRSI) is to comprehensively assess nonproliferation and radiological threat concerns that pertain to research reactors and associated facilities and make recommendations on how to mitigate such threats. Following the completion of a study and action plan in FY 2004, follow-on activities in FY 2005 will be performed by the relevant program office and may include: support to the IAEA for working groups on Research Reactor Security; foreign site visits and assessments of high risk reactor sites; development of generic and site-specific security upgrade plans for foreign sites; development of a comprehensive research reactor and related sites data base; support for one international conference on Research Reactor Security Issues; and continuing assessments of threats to research reactors.

Decrease due to the completion in FY 2004 of MPC&A security upgrades to the Russian RADON nuclear waste sites.

Total, Radiological Dispersal Devices	**47,963**	**36,000**	**25,000**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
National Programs and Sustainability	**44,439**	**28,000**	**27,000**

The National Programs and Sustainability element enables the MPC&A program to implement a focused strategy to ensure that MPC&A programs can be sustained in the Russia Federation (RF) and other partner countries, by establishing and implementing national, regional and site infrastructure components necessary for the successful long term operation and management of MPC&A systems. These components are necessary to the creation of an environment in which MPC&A systems can be fully and effectively transitioned to partner countries who will operate and sustain them for the long term.

Continue to assist the RF in establishing the necessary federal and agency level regulations, reporting requirements and oversight processes that set and review the parameters for an acceptable MPC&A system. Continue to create an infrastructure at industry and regional levels to help support and sustain upgraded MPC&A systems at sites. The infrastructure includes facilities and subject matter experts in areas of MC&A, Physical Protection (PP), and Protective Force (PF) training and methodological development; MPC&A inspections; equipment testing, maintenance, repair, and metrology; nuclear reference standards and procedures to support material measurements; and higher education in the MPC&A field.

Operate and maintain 3 regional technical support facilities to provide equipment repair, maintenance, calibration assistance, operations assistance, configuration control, warranty service, spare parts inventories, and training for critical MPC&A systems and components. Continue to develop Russian MPC&A training, infrastructure curricula and support provisions of MPC&A courses.

Assist the Russian sites in achieving long-term effective operation of their MPC&A systems through development of procedures, process analysis, system effectiveness evaluation, cost analysis, and performance testing. This also includes manufacture of transportation overpacks to prevent theft of nuclear material while in transit, and hardening railcars and trucks to provide additional protection for guards escorting material shipments. At this time it is estimated that a total of 550 transportation overpacks will be manufactured, 331 trucks will be hardened and 161 railcars will be hardened. In FY 2005, an additional 3% (19) secure transportation overpacks will be produced, an additional 4% (12) of the trucks will be hardened, and an additional 3% (5) railcars will be hardened, (increasing the total percentages to 71% for overpacks, 66% for trucks and 69% for railcars).

Begin implementation of an MPC&A operations and transition strategy to achieve the goal of fully transitioning operations and maintenance of MPC&A upgrades to full Russian responsibility by working with the Russian Federation to develop the capabilities they need to maintain the security of their weapons usable nuclear material. Decrease due to a reprioritization of all MPC&A program activities to support MPC&A upgrades in countries outside of Russia and the former Soviet States.

Total, National Programs and Sustainability	**44,439**	**28,000**	**27,000**

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Second Line of Defense Core Program...	**40,144**	**47,800**	**24,000**

The SLD program deploys radiation detection monitors at strategic transit and border crossings and at air and sea transshipment hubs in Russia and other countries to provide these governments with the technical means to deter and interdict illicit trafficking in nuclear and other radioactive materials. Sites to be addressed are selected through a site prioritization and selection methodology established to effectively plan and utilize program resources. The methodology incorporates various prioritization factors and allows for the development of a prioritized list of sites, which can be selected for the effective application of resources to the most important locations. In FY 2005, radiation detection equipment will be installed at an additional 20 foreign sites, increasing the total sites (non-Mega-Port) with completed installations to 91. Additionally, the program will continue to maintain previously deployed Department of State equipment in 22 countries.

Operation of the Nuclear Assessment Program which provides a capability for monitoring and assessing illicit nuclear material trafficking incidents, assessing communicated nuclear threats, and maintaining a centralized data base containing trafficking, threat, and nonproliferation/terrorism information was transferred to the Department of Homeland Security as of March 1st in FY 2003.

Decrease due to the completion of radiation detection equipment installations at sites in Greece, Slovenia and the majority of sites in Russia.

Mega-Ports..	**99,000**	**4,200**	**15,000**

NNSA is pursuing cooperation with international partners to deploy and equip key ports with radiation detection equipment and to provide training to appropriate law enforcement officials, in order to provide them the technical means to detect, deter and interdict illicit trafficking in nuclear and other radioactive materials. This program supports the Department of Homeland Security's (DHS) Bureau of Customs and Border Protection's Container Security Initiative (CSI). Under CSI, the US Government partners with countries that have ports that ship a large volume of containerized cargo to the United States in an effort to strengthen screening of cargo. By adding radiation detection capabilities at seaports, we will be able to screen cargo for nuclear and radioactive materials that could be used in a weapon of mass destruction or a RDD (dirty bomb) against the US, the host country and our allies. NNSA's program is focused on a subset of the ports that have committed to CSI.

The ports of interest to DOE have been identified based upon several factors, such as routing criteria and traffic characteristics. Under this initiative, NNSA plans to implement the program in up to twenty international ports. Implementation of the Mega-Ports program at any given port is contingent upon the agreement/invitation of the government in the country in which the port lies. NNSA is expanding its efforts to engage those governments that have completed agreements for CSI to determine their interest in working with us to implement the Mega-Ports project.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Provide site surveys, vulnerability assessments, radiation detection equipment design, procurement and installation required for a total of 3 Mega-Seaports, (2 from funds provided in the FY 2003 supplemental, increasing number of ports which are complete to 6). Provide comprehensive training to Customs officials and other appropriate personnel in the host country for the operation and maintenance of installed radiation detection monitors, including alarm evaluations and reporting.

Increase due to the funding for the purchase and installation of radiation detection equipment at one-Mega-Port.

Total, Second Line of Defense..	**139,144**	**52,000**	**39,000**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Navy Complex**	
Decrease due to the completion of either rapid or comprehensive upgrades at a vast majority all (85%) of Russian Navy warhead sites in FY 2004 and the transition to sustainability activities..	- 23,000
▪ **Strategic Rocket Forces**	
Increase due to the initiation of MPC&A comprehensive upgrades 3 additional sites over the FY 2004 level..	+ 21,000
▪ **Minatom Weapons Complex**	
Increase due to start of MPC&A rapid/comprehensive upgrades to additional areas within 3 sites	+ 10,513
▪ **Civilian Nuclear Sites**	
Decrease due to the initiation and ramp-up of MPC&A cooperation with countries outside of Russia and the former Soviet States begun in FY 2004	- 2,000
▪ **Material Consolidation and Conversion**	
Decrease due to a slight decrease in the number of buildings scheduled to be cleared of all weapons-usable material and no funding for accelerated MCC until additional HEU that could be available for conversion to LEU is known................	- 2,000
▪ **Radiological Dispersal Devices**	
Decrease due to the completion in FY 2004 of MPC&A security upgrades to the Russian RADON nuclear waste sites...	- 11,000
▪ **National Programs and Sustainability**	
Decrease due to a reprioritization of all MPC&A program activities to support MPC&A upgrades in countries outside of Russia and the former Soviet States	- 1,000
▪ **Second Line of Defense**	
Decrease due to the completion of radiation detection equipment installations in Greece and Slovenia and the majority of sites in Russia, offset by an increase for the purchase and installation of radiation detection equipment at one-Mega-Port....	- 13,000
Total Funding Change, International Nuclear Materials Protection and Cooperation	- 20,487

Russian Transition Initiatives

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Russian Transition Initiatives					
Russian Transition Initiatives............	39,081	39,764	41,000	+ 1,236	+ 3.1%
Total, Russian Transition Initiatives.........	39,081	39,764	41,000	+ 1,236	+ 3.1%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
Russian Transition Initiatives.......	41,000	42,000	43,000	43,000	44,000	213,000

Description

This program will prevent adverse migration of weapons of mass destruction expertise by engaging weapons experts in peaceful efforts and by helping to downsize the Russian nuclear weapons complex.

Benefits to Program Goal 02.45.00.00 Russian Transition Initiatives

The Russian Transition Initiatives program contributes to Program Goal 02.45.00.00 by reducing the global nuclear danger of proliferation of technologies and expertise by engaging NIS WMD experts in cooperative projects involving the ten major DOE/NNSA National Laboratories and U.S. industry.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Engaged approximately 2,000 scientists, engineers, and technicians at nuclear NIS institutes, and approximately 800 scientists, engineers and technicians at NIS chemical/biological institutes in 50 projects to provide long-term commercial employment. (MET GOAL)	Engaged approximately 2,000 scientists, engineers, and technicians at nuclear NIS institutes, and approximately 800 scientists, engineers and technicians at NIS chemical/biological institutes in 40 projects to provide long-term commercial employment. (MET GOAL)	Engaged 2,500 former WMD scientists on cooperative commercial projects. (MET GOAL) Sign an Agreement with the Russian Ministry of Atomic Energy for access to closed nuclear sites. (MET GOAL)	Enhance nonproliferation efforts in the Russian nuclear cities, and accelerate several Russian technology development efforts that have clear counter-terrorism or terrorism response applications under the Russian Transition Initiatives. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Annual number of former Soviet weapons scientists, engineers, and technicians engaged.	7,600	7,900	8,200	8,500	8,800	9,100	9,400	15,000 by 2030
Cumulative number of technologies commercialized or businesses created.	20 technologies commercialized or businesses were created.	21 technologies commercialized or businesses created.	22 technologies commercialized or businesses created.	23 technologies commercialized or businesses created.	25 technologies commercialized or businesses created.	27 technologies commercialized or businesses created.	29 technologies commercialized or businesses created.	60 technologies commercialized or businesses created by 2015. (Intermediate Target)
Cumulative percentage of nuclear complex reduction targets completed at six weapons facilities.	Met 49% of all nuclear complex reduction targets at six weapons facilities and completed all targets at one of six sites.	Meet 53% of all nuclear complex reduction targets at six weapons facilities and complete all targets at one of six sites.	Meet 58% of all nuclear complex reduction targets at six weapons facilities and complete all targets at two of six sites.	Meet 61% of all nuclear complex reduction targets at six weapons facilities and complete all targets at three of six sites.	Meet 68% of all nuclear complex reduction targets at six weapons facilities and complete all targets at three of six sites.	Meet 65% of all nuclear complex reduction targets at six weapons facilities and complete all targets at three of six sites.	Meet 68% of all nuclear complex reduction targets at six weapons facilities and complete all targets at four of six sites.	Meet 100% of the targets for all six weapons facilities by 2015.
Annual percentage of non-USG funding contributions obtained. (EFFICIENCY MEASURE)	Obtained non-USG funding contributions equal to 50% of RTI project funds ($23 million).	Obtain non-USG funding contributions equal to 60% of RTI project funds ($24 million).	Obtain non-USG funding contributions equal to 70% of RTI project funds ($28.7 million).	Obtain non-USG funding contributions equal to 80% of RTI project funds ($33.6 million).	Obtain non-USG funding contributions equal to 90% of RTI project funds ($38.7 million).	Obtain non-USG funding contributions equal to 100% of RTI project funds ($45 million).	Obtain non-USG funding contributions equal to 100% of RTI project funds ($50 million).	Obtain non-USG funding contributions equal to 100% of RTI project funds by 2008.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Russian Transition Initiatives.......................................	**39,081**	**39,764**	**41,000**

The former Soviet weapons complex is oversized and in need of resources, making it a dangerous target for terrorists. Roughly half of the 75,000 scientists currently employed by Russia, for example, are needed for stewardship work. The remaining 35,000 under-employed nuclear experts represent a knowledge base that terrorist groups and proliferant countries could target for clandestine nuclear programs. Moreover, if left in place within the complex, these personnel create a surge capacity that would allow Russia to resume weapons work at any moment. RTI complements Russian efforts to reduce its WMD complex and enables it to reduce its workforce through technology commercialization and support for commercial development.

The extent to which WMD expertise is less subject to adverse migration can be measured in four ways. The cumulative number of former Soviet weapons scientists, engineers and technicians that RTI employs in non-weapons commercial work indicates a real reduction in the WMD workforce as that expertise is transitioned to well-paying civilian jobs, as well as models of success for host governments to follow. RTI's end goal is to create 15,000 civilian jobs outside the WMD complex by 2030. The cumulative number of technologies commercialized or businesses created is an indicator of the self-sustainability of those civilian jobs after RTI exits. RTI has an intermediate goal of creating 60 new technologies or businesses by 2015 to support sustainable job creation targets. RTI has established downsizing targets for 2 weapons assembly facilities, 2 plutonium production facilities, and 2 weapons design institutes that represent the highest priority in Russian workforce reduction and facility closure plans. One hundred percent of downsizing targets will be met by 2015, including those in support of the Elimination of Weapons Grade Plutonium Program. The efficiency of these activities is measured by the percentage of non-US Government contributions obtained in support of RTI activities. RTI will achieve matching contribution in the amount of 100% of project funds by 2008, and will maintain that percentage through program completion.

Total, Russian Transition Initiatives	**39,081**	**39,764**	**41,000**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Russian Transition Initiatives**	
Increase will enable the program to expand engagement in weapons institutes........	+ 1,236
Total Funding Change, Russian Transition Initiatives	+ 1,236

HEU Transparency Implementation

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
HEU Transparency Implementation					
HEU Transparency Implementation................	17,118	17,894	20,950	+ 3,056	+ 17.1%
Total, HEU Transparency Implementation..........................	17,118	17,894	20,950	+ 3,056	+ 17.1%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
HEU Transparency Implementation.....	20,950	21,212	21,000	20,000	20,000	103,162

Description

Provide assurance that the LEU being purchased under the 1993 U.S. /Russian HEU Purchase Agreement is derived from HEU extracted from dismantled Russian nuclear weapons, by developing and implementing mutually agreeable transparency measures that the 500 MT of HEU covered by the Agreement is permanently down blended and eliminated from Russian inventory.

Benefits to Program Goal 02.41.00.00 HEU Transparency

The HEU Transparency program annually monitors the conversion and processing of 30 metric tons (MT) of weapons-grade HEU into approximately 900 MT of LEU at 4 Russian Processing facilities. This LEU is then delivered to the U.S. Enrichment Corporation for conversion into commercial power reactor fuel elements. These transparency operations should continue through 2013 when the 500 MT of HEU will be completely converted.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Number of Blend-Down Monitoring Systems operational and the annual percent of operation during the HEU blend-down process.	One Blend-Down Monitoring System (BDMS) at the Ural Electrochemical Integrated Plant (UEIP). Annual percent of operation was 92%. A second BDMS at the Electro Chemical Plant (ECP) became operational in March 2003.	Two Blend-Down Monitoring Systems (One at UEIP and one at the Electro Chemical Plant [ECP] in Zelenogorsk). Annual percent of operation targeted for 94%.	Three Blend-Down Monitoring Systems (UEIP, ECP, the Siberian Chemical Combine [SchE] in Seversk). Annual percent of operation targeted for 95%.	Three Blend-Down Monitoring Systems (UEIP, ECP, and SchE). Annual percent of operation targeted for 95%.	Three Blend-Down Monitoring Systems (UEIP, ECP, and SchE). Annual percent of operation targeted for 95%.	Three Blend-Down Monitoring Systems (UEIP, ECP, and SchE). Annual percent of operation targeted for 95%.	Three Blend-Down Monitoring Systems (UEIP, ECP, and SchE). Annual percent of operation targeted for 95%.	2013, for the 500 Metric Tons associated with the HEU Purchase Agreement.
Percentage completed of the 24 annually allowed Special Monitoring Visits (SMVs) to the four Russian HEU-to-LEU processing facilities to monitor 30 MT per year of HEU converted to LEU.	Conduct 22 or 92% of the allowed 24 monitoring visits to Russian facilities. Only 18 were budgeted in favor of resources to build a second continuous Blend-Down	Conduct 22 or 92% of 24 allowed monitoring visits to Russian facilities.	Conduct 100% of 24 allowed monitoring visits to Russian facilities.	Conduct 100% of 24 allowed monitoring visits to Russian facilities.	Conduct 100% of 24 allowed monitoring visits to Russian facilities.	Conduct 100% of 24 allowed monitoring visits to Russian facilities.	Conduct 100% of 24 allowed monitoring visits to Russian facilities.	2013, for the 500 Metric Tons associated with the HEU Purchase Agreement.

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
	Monitoring System.							
Percentage of the year that the on-site Transparency Monitoring Office (TMO) is staffed at the Ural Electrochemical Integrated Plant.	UEIP TMO was staffed and operating for 35 weeks of the 50 weeks, or 70%, of the related plant operation cycle.	Target TMO coverage of plant operating schedule at 75%.	Target TMO coverage of plant operating schedule at 76%.	Target TMO coverage of plant operating schedule at 77%.	Target TMO coverage of plant operating schedule at 78%.	Target TMO coverage of plant operating schedule at 79%.	. Target TMO coverage of plant operating schedule at 80%.	2013, for the 500 Metric Tons associated with the HEU Purchase Agreement.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
HEU Transparency Implementation............................	**17,118**	**17,894**	**20,950**

Annually monitor the conversion of 30 metric tons (MT) of weapons-grade HEU into approximately 900 MT of LEU at 4 Russian Processing facilities to assure that the LEU being purchased under the HEU Purchase agreement is derived from dismantled nuclear weapons. Develop and perform mutually agreeable (US/RF) transparency measures, including:

Conduct 18 Special Monitoring Visits (SMVs) in FY03, 22 in FY04, and 24 in FY05, to the 4 Russian facilities. The 24 visits require approximately 180 technical monitors. SMV's are the primary source of transparency data and are the only way to retrieve Blend Down Monitoring System (BDMS) output reports. Provide permanent monitoring in Russia by staffing the Transparency Monitoring Office in Novouralsk, Russia with 14 technical experts performing bimonthly rotations allowing daily access to the Ural Electrochemical Integrated Plant (UEIP) processing and down blending operations.

Maintain the installed BDMS equipment that provides continuous and independent measurements of HEU uranium hexaflouride (UF_6) down blending into LEU-UF6 at blend-points in two dilution facilities (UEIP and Electro Chemical Plant, ECP) in FY 2003. Complete fabrication of BDMS equipment for SChE in FY 2004, with installation scheduled for FY2005. Procure, replace, and dispose of radioactive sources (Co-57 and Cf -252) critical to the BDMS operations for each plant. The Co-57 sources have a 3/4 year half-life, which consequently requires annual replacement and BDMS equipment re-calibration. The Cf-252 sources require replacement every two years.

Also in FY05, plan and prepare retrofit/replacement of the BDMS system at UEIP which was built in 1996 and is experiencing hardware and software obsolescence issues.

Maintain portable Non Destructive Assay (NDA) instruments shipped to Russian sites for U.S. monitor use. In FY2004, complete the delivery of improved portable NDA instruments to replace the original NDA units built and shipped in 1997.

Conduct annual inventory of natural uranium feedstock in storage cylinders at Russian facilities, which were supplied by U.S. Enrichment Corp. (USEC) for the equivalent Russian natural uranium in the LEU purchased.

Reimburse Russian facilities for costs of goods and services provided to U.S. monitors, such as escorts outside controlled areas, translators, and transportation assistance. Provide planning, logistical support and coordination with MinAtom for monitoring activities. Train monitors in both technical and procedural requirements. Compile, archive and analyze all transparency monitoring data, especially BDMS output reports. Prepare monthly, annual, and ad hoc reports on HEU processing and HEU to LEU conversion rates and quantities. Maintain Worker Health and Safety with personnel radiation dosimetry and bio-assay program covering all monitors traveling to Russia. Assure the occupational safety of U.S. monitors working in Russia and update the Program Health and Safety plan, as needed.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Accommodate Russian monitoring in the U.S. by maintaining a Permanent Presence Office (PPO) at Paducah, KY, for Russian monitors. Provide logistical and security assistance to RF monitoring teams monitoring operations at U.S. facilities. Compile and provide LEU accountability documents to MinAtom per negotiated transparency agreements. Provide interpreters, translators, logistical and technical support, as necessary, for Transparency Review Committee and other negotiating sessions in Russia and elsewhere.

Total, HEU Transparency Implementation	**17,118**	**17,894**	**20,950**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **HEU Transparency Implementation**	
Increase reflects the costs to upgrade the obsolete Blend Down Monitoring System at the Ural Electrochemical Integrated Plant (UEIP) that was fabricated in 1996, and the increase from 22 to the fully allowable 24 Special Monitoring Visits (SMVs) to the four Russian HEU processing facilities..................................	+ 3,056
Total Funding Change, HEU Transparency Implementation..................................	+ 3,056

Elimination of Weapons Grade Plutonium Production

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Elimination of Weapons Grade Plutonium Production					
Seversk Pu Production Elimination...........	32,339	48,300	39,500	- 8,800	- 18.2%
Zheleznogorsk Pu Production Elimination...	15,000	15,000	9,597	- 5,403	- 36.0%
Plutonium Production Reactor (PPR) Safety..	200	0	0	0	+ 0.0%
Technical Support Activities......................	1,682	1,735	1,000	- 735	- 42.4%
Subtotal, EWGPP...	49,221	65,035	50,097	- 14,938	- 23.0%
Less DOD funding transfer a	-200	0	0	0	0
Total, Elimination of Weapons Grade Plutonium Production.......................................	49,021	65,035 [b]	50,097	- 14,938	- 23.0%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Elimination of Weapons Grade Plutonium Production...........	50,097 [c]	56,000	59,497	60,339	66,862	292,795

[a] Of the $74.0 million transferred from DOD in FY03, $0.2M is considered re-appropriated in the current-year and $73.8 million is prior-year balances. Up to $17.0 million of the prior-year balances is being applied to the PPR safety upgrades.

[b] $15,300,000 reappropriated in FY 2004 from unobligated balances expiring in FY 2003 transferred from DoD in accordance with the National Defense Authorization Act of FY 2004.

[c] Excludes unobligated balances associated with $74,000,000 transferred from Department of Defense.

Description

The EWGPP program reduces the threat of nuclear terrorism by facilitating shutdown of the three remaining weapons-grade plutonium production reactors in the Russian Federation through: (1) construction of a new fossil-fuel (coal) plant at Zheleznogorsk; (2) refurbishment of an existing fossil-fuel (coal) power plant at Seversk; and (3) execution of a nuclear safety upgrades project to improve reactor safety pending shutdown of the reactors.

Benefits to Program Goal 02.42.00.00 Elimination of Weapons-Grade Plutonium Production

Within the Elimination of Weapons-Grade Plutonium Production program, four subprograms each make unique contributions to Program Goal 02.42.00.00. The Seversk Plutonium Production Elimination Project subprogram facilitates the shut down of two weapons-grade plutonium production reactors by refurbishing an existing 1950s fossil-fueled facility. The Zheleznogorsk Plutonium Production Elimination Project subprogram facilitates the shut down of one weapons-grade plutonium production reactors by providing a replacement fossil-fueled facility. The Plutonium Production Reactor Safety subprogram consists of short-term safety upgrades to the three plutonium production reactors and was an integral part of the original Plutonium Production Reactor Shutdown Agreement and the associated Implementing Agreement. The Technical Support Activities subprogram provides resources for crosscutting efforts, such as project reviews and reporting, contract administration, intergovernmental contract negotiation support, general laboratory technical support, quality assurance, foreign logistical support, and other communications products and services.

Program Assessment Rating Tool (PART)

As a result of the FY2005 OMB PART review of EWGPP, OMB recognized the program for having very good, solid, and tangible performance measures to effectively guide and monitor program progress. However, because the EWGPP program was recently transferred to DOE/NNSA from DoD, it is relatively new for DOE/NNSA and has not had a chance to develop a track record of results. Therefore, OMB assigned a rating of "Results not demonstrated."

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	There were no related targets.	There were no related targets.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percentage of progress towards constructing a fossil plant in Seversk facilitating shut down of two weapons-grade plutonium production reactors. (EFFICIENCY MEASURE) * Based on pre-conceptual design feasibility study.	Completed 1% toward the construction of a fossil plant in Seversk (increasing the total to 1% complete towards shutting down two plutonium production reactors by 2008)*.	Complete~~d~~ an additional 15% toward the construction of a fossil plant in Seversk (increasing the total to 16% complete towards shutting down two plutonium production reactors by 2008)*.	Complete~~d~~ an additional 32% toward the construction of a fossil plant in Seversk (increasing the total to 48% complete towards shutting down two plutonium production reactors by 2008)*.	Complete~~d~~ an additional 27% toward the construction of a fossil plant in Seversk (increasing the total to 75% complete towards shutting down two plutonium production reactors by 2008)*.	Complete~~d~~ an additional 19% toward the construction of a fossil plant in Seversk (increasing the total to 94% complete towards shutting down two plutonium production reactors by 2008)*.	Complete~~d~~ an additional 6% toward the construction of a fossil plant in Seversk (increasing the total to 100% complete towards shutting down two plutonium production reactors by 2008)*.		2008.
Percentage of progress towards constructing a fossil plant in Zheleznogorsk facilitating shut down of one weapons-grade plutonium production reactor.(EFFICIENCY MEASURE) * Based on pre-conceptual design feasibility study.	Completed 0.5% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 0.5% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 2.5% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 3% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 10% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 13% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 16% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 27% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 18% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 44% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 20% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 62% complete towards shutting down one plutonium production reactor by 2011)*.	Complete~~d~~ 20% toward the construction of a fossil plant in Zheleznogorsk (increasing the total to 82% complete towards shutting down one plutonium production reactor by 2011)*.	2011.

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percentage of progress towards completing interim safety upgrades to the three operating Russian plutonium production reactors. (EFFICIENCY MEASURE) * Based on pre-conceptual design feasibility study.	Complete 5% toward completion of needed safety upgrades (increasing the total to 5% complete towards reducing the risk of accidents for the duration of the reactors operation project will be complete by 2006)*	Complete 9% toward completion of needed safety upgrades (increasing the total to 14% complete towards reducing the risk of accidents for the duration of the reactors operation project will be complete by 2006)*	Complete 35% toward completion of needed safety upgrades (increasing the total to 49% complete towards reducing the risk of accidents for the duration of the reactors operation project will be complete by 2006)*	Complete 51% toward completion of needed safety upgrades (increasing the total to 100% complete towards reducing the risk of accidents for the duration of the reactors operation project will be complete by 2006)*				2006.
Amount of Russian Federation weapons-grade plutonium production eliminated annually, and cumulatively, from the 1.2 Metric Tons per year baseline.	0 Metric Tons annually, and cumulatively eliminated.	0 Metric Tons annually, and cumulatively eliminated.	0 Metric Tons annually, and cumulatively eliminated.	0 Metric Tons annually, and cumulatively eliminated.	0 Metric Tons annually, and cumulatively eliminated.	0 Metric Tons annually, and cumulatively eliminated.	0.8 Metric Tons annually, and 0.8 MT cumulatively eliminated.	1.2 Metric Tons eliminated annually in 2012

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Seversk Plutonium Production Elimination................	**32,339**	**48,300**	**39,500**

The Seversk Plutonium Production Elimination Project facilitates the shut down of two weapons-grade plutonium production reactors by refurbishing an existing 1950s fossil-fueled facility. The Russian Federation began upgrades in 1978 to the fossil fuel facility but funding problems, soon thereafter, caused difficulties from that point forward. The U.S. plan is to build on those efforts.

In FY 2003, negotiations were concluded and revisions to the master U.S./R.F agreement, which covered the previous core-conversion approach to plutonium production elimination, were finalized. An intergovernmental EWGPP Implementation Agreement and site access arrangements were completed. The program established management, contracting, implementation and oversight mechanisms for both U.S. and R.F. contractors. The program received conditional approval of Critical Decision 0, approve mission need, on December 30, 2002, and resolution of all CD-0 issues on March 21, 2003. The acquisition strategy was to select an U.S. integrating contractor from the Defense Threat Reduction Agency, Cooperative Threat Reduction Integrating Contract (CTRIC) that will interface with a R.F. integrating contractor that will subcontract to the Russian Federation workers. The U.S. integrating contractor will verify work performed. The project awarded a task order under the CTRIC contract on August 6, 2003, to Washington Group International. Efforts include performing the site survey and assessment, initiating a detailed cost and schedule baseline, and negotiating Statement of Work, costs and schedule with the Russian Federation Integrating Contractor.

In FY 2004, Critical Decision reviews for CD-1 (preliminary baseline), and CD-3A (long lead time procurements) is scheduled for the end of the second quarter. CD-2 (performance baseline) will be completed early in the fourth quarter. This will allow final design and long-lead procurement to commence. CD-3, approve start of construction, is scheduled for the fourth quarter. This will allow refurbishment of the Seversk Thermal Heat and Electricity Plant (TETs) to begin with tasks at the new boiler unit, one turbine generator, the new fuel conveying system, and two boiler units. Specific tasks include: begin the working design of the new boiler unit; begin acquisition of equipment for the new boiler unit; begin the working design of the turbine generator, begin acquisition of equipment for the turbine generator; begin installation of the new fuel conveying system; and begin refurbishment of two boiler units.

In FY 2005, the project will continue work at the new boiler unit, the first turbine generator, the new fuel conveying system, and two boiler units, and will initiate work at the second turbine generator, at two more boiler units, on the auxiliary equipment, and the auxiliary structures. For the new boiler unit specific tasks will include: complete the working design; complete acquisition of equipment and materials; and begin construction and installation. For the first turbine generator specific tasks will include: complete working design; complete acquisition of equipment and materials; begin construction and installation; and begin and complete dismantling of existing equipment. For the second turbine generator specific tasks will include: begin working design; begin acquisition of equipment and materials; and begin dismantling of existing equipment. ~~Continue~~ Installation of the fuel conveying system will continue, as will refurbishment of the first two boiler units. Work will begin on

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

refurbishment of the second two boiler units. For the auxiliary equipment (such as turbine cooling water pumps) specific tasks will include: begin and complete working design; begin acquisition of equipment and materials; and begin construction. Begin auxiliary structures task by beginning the construction of the Fuel and Lubrication Storage Depot.

The FY 2005 relative decrease largely reflects reappropriation of $15.3 million in FY 2004 of expired unobligated balances that expired at the end of FY 2003. The $15.3 million was part of the $74 million in prior year balances transferred to DOE along with the EWGPP program upon passage of the FY 2003 National Defense Authorization Act. FY 2005 funding provides for the Seversk project to maintain its 2008 completion schedule.

	FY 2003	FY 2004	FY 2005
Total, Seversk Plutonium Production Elimination......	**32,339**	**33,000**	**39,500**
Zheleznogorsk Plutonium Production Elimination.....	**15,000**	**15,000**	**9,597**

The Zheleznogorsk Plutonium Production Elimination Project facilitates the shut down of one weapons-grade plutonium production reactors by providing a replacement fossil-fueled facility.

In FY 2003, negotiations were concluded and revisions to the master U.S./R.F agreement, which covered the previous core-conversion approach to plutonium production elimination, were finalized. An intergovernmental EWGPP Implementation Agreement and site access arrangements were completed. The program established management, contracting, implementation and oversight mechanisms for both U.S. and R.F. contractors. The program received conditional approval of Critical Decision 0, approve mission need, on December 30, 2002, and resolution of all CD-0 issues on March 21, 2003. The acquisition strategy was to select an U.S. integrating contractor from the Defense Threat Reduction Agency, Cooperative Threat Reduction Integrating Contract (CTRIC) that will interface with a R.F. integrating contractor that will subcontract to the Russian Federation workers. The U.S. integrating contractor will verify work performed. The project awarded a task order under the CTRIC contract on August 1, 2003 to Raytheon Technical Services Company.

In FY 2004, the site will be evaluated to determine usefulness of existing buildings and structures. The project will complete the preliminary design and preliminary site details, obtain Russian regulatory approval, and initiate detailed design activities for the Zheleznogorsk Thermal Heat and Electricity Plant (TETs). Critical Decision 1, preliminary baseline, is scheduled for the end of the third quarter and Critical Decision 2, performance baseline, is scheduled for the ~~forth~~ second quarter FY 2005.

In FY 2005, the project will continue detailed design and initiate construction. The construction includes foundations, buildings, structures, and plant infrastructure. Long lead procurements will start including boilers and other large equipment. The U.S. integrating contractor will provide over-site while monitoring schedule and cost compliance from the Moscow-based Program Management Office and the established field office in the Krasznayarsk region of southern Siberia. A thorough design review will be conducted with particular focus applied to both limiting construction scope to the statement of objectives and the application of value engineering practices. The Russian integrating contractor, Rosatomstroi will release a series of competitive tenders to pre-qualified Russian general

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

contractors, material and equipment suppliers. The subcontract selection process will be based on both technical competence and overall cost. A thorough cost analysis will be performed to ensure compliance with GAO policies and to ensure best value practices. A formalized risk mitigation plan will be finalized and implemented during FY 2005. Also during FY 2005, a detailed plan will be written to provide linkage between construction milestones for the power plant and the shutdown of the reactor.

FY 2005 decrease to Zheleznogorsk reflects the higher funding priority of Seversk project, which has a shorter overall schedule and where two of the three plutonium reactors are located. Zheleznogorsk funding is adequate to maintain the 2011 completion schedule.

	FY 2003	FY 2004	FY 2005
Total, Zheleznogorsk Plutonium Production Elimination	**15,000**	**15,000**	**9,597**
Plutonium Production Reactor Safety	**200**	**0**	**0**

This element consists of short-term safety upgrades to the three plutonium production reactors and was an integral part of the original Plutonium Production Reactor Shutdown Agreement and the associated Implementing Agreement. Both the U.S. and the Russian Federation (RF) agree that these reactors have serious safety deficiencies. U.S. safety assistance is in the best interest of the U.S. as it supports energy security with relation to our country's nearly 20% dependence on nuclear power and because U.S. funding and technical expertise support will allow urgent safety upgrades to be implemented much more quickly than if the RF were to undertake them, as the RF with its constrained financial resources may not have been able to undertake them.

The three plutonium production reactors were designed in the 1950s, built in the 1960s, and began operation in 1964 or 1965. The shutdown of these reactors is a national security and nonproliferation goal. The current approach to shut down these reactors and cease plutonium production, is to supply alternative heat and electricity for the surrounding communities from fossil-fuel power plants. However, the reactors will continue to operate to provide heat and electricity for the local populations until the fossil fuel plants can be brought on-line. Recognizing that these reactors have safety deficiencies in the areas of design, equipment, materials, and training, they are considered to be the three highest safety risk reactors in the world. Efforts to jointly address appropriate and urgent safety upgrades, without extending the operating life of these reactors, are being conducted.

EWGPP Implementing Agreement has been concluded and Access Arrangements for nuclear safety site access have been negotiated and are in final concurrence, but not yet signed. $21 million, including $17 million in FY 2003, utilizing prior-year funding transferred from DOD, fully funds the program efforts. However due to scheduling concerns mainly related to site Access Arrangements, nuclear safety upgrade projects that cannot be implemented within the desired time frame will not be pursued and available funding will be used to accelerate the Zheleznogorsk project efforts. Safety upgrade projects ~~for~~ include: Emergency Cooling Modernization; Reactivity Control and Monitoring; Control and Protection System; Emergency Electrical Power Supply; Improved Fire Protection for Emergency Electrical Power Supply; Emergency Communications; Elimination of Iron Shot; Graphite Stack Stabilization; Strain Gauge Monitoring; Emergency Cooling Analysis; Safety Analysis Report; Probabilistic Safety

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Assessment; Accident Mitigation Manual; Experimental Fuel Rupture Testing; Computer Codes; and Passive Safety Protection Development. The Plutonium

Production Reactor Safety Project will be completed two years after signing the initial contracts with the RF.

On August 7, 2003, the project received Critical Decision-1 approval for Preliminary Baseline Range and approval for CD-3A, to perform long-lead time procurements. This project previously received conditional approval of Critical Decision 0, approve mission need, on December 30, 2002, as part of the broader EWGPP program.

In FY 2004, the Department will continue all the subprojects started in FY 2003. Completion of the associated projects will occur within 2-years from signing of initial contracts due to the long lead-time of some of the equipment. All upgrades are planned for completion by FY 2006.

Total, Plutonium Production Reactor Safety	**200**	**0**	**0**
Technical Support Activities	**1,682**	**1,735**	**1,000**

Provide resources for crosscutting efforts, such as project reviews and reporting, contract administration, intergovernmental contract negotiation support, general laboratory technical support, quality assurance, foreign logistical support, and other communications products and services. Also provide~~s~~ the necessary supporting technical and engineering expertise and independent analyses, and cross-cutting project management system support.

Initial start up efforts also include support for an independent review of alternative acquisition strategies, for development of an acquisition strategy, selection of the U.S. Integrating Contractor (IC), and establishment and support of Project Management certification and training for the Russian Federation integrating contractor, Rosatomstroy. FY 2005 decrease reflects reduction of support requirements associated with program start-up activities.

Total, Technical Support Activities	**1,682**	**1,735**	**1,000**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Seversk Plutonium Production Elimination**	
The FY 2005 relative decrease largely reflects reappropriation of $15.3 million in FY 2004 of expired unobligated balances that expired at the end of FY 2003. The $15.3 million was part of the $74 million in prior year balances transferred to DOE along with the EWGPP program upon passage of the FY 2003 National Defense Authorization Act.	-8,800
▪ **Zheleznogorsk Plutonium Production Elimination**	
Decrease to Zheleznogorsk reflects the higher funding priority of Seversk project, which has a shorter overall schedule and where two of the three plutonium reactors are located. Zheleznogorsk funding is adequate to maintain the 2011 completion schedule	- 5,403
▪ **Technical Support Activities**	
Decrease reflects reduction of support requirements associated with program start-up activities	- 735
Total Funding Change, Elimination of Weapons Grade Plutonium Production	-14, 938

Fissile Materials Disposition

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Operations and Maintenance (O&M)					
U.S. Plutonium Disposition.............	93,800	70,100	47,900	- 22,200	- 31.7%
U.S. Uranium Disposition [a] ……	81,372	92,640	95,500	+ 2,860	+ 3.1%
Supporting Activities.......................	21,923	29,955	41,300	+ 11,345	+ 37.9%
Subtotal, O&M................................	197,095	192,695	184,700	- 7,995	- 4.1%
Construction					
99-D-141, Pit Disassembly and Conversion Facility [d]…..	34,775	13,520	32,300	+ 18,780	+ 138.9%
99-D-143, Mixed Oxide Fuel Fabrication Facility [b].......	92,401	399,628	368,000	- 31,628	- 7.9%
01-D-407, HEU Blend Down Project [c] ………………	23,476	0	0	0	0.0%
Subtotal, Construction.....................	150,652	413,148	400,300	- 12,848	- 3.1%
Total, U.S. Surplus FMD.....................	347,747	605,843	585,000	- 20,843	- 3.4%
Russian Materials Disposition [e] ……………………	97,781	46,975	64,000	+ 17,025	+ 36.2%
Use of Prior Year Balances.............	-64,000	0	0	0	0.0%
Total, Fissile Materials Disposition...	381,528	652,818	649,000	- 3,818	- 0.6%

[a] Excess FY 2003 operating funds in the amount of $7,650,000 are proposed to be reprogrammed from the HEU Blend Down Project to support the Pit Disassembly and Conversion Facility (PDCF).

[b] FY 2004 construction funds in the amount of $11,405,000 are proposed to be reprogrammed from the MOX Fuel Fabrication Facility Project to the Pit Disassembly and Conversion Facility (PDCF). This reduces the FY 2004 amount for the Mixed Oxide Fuel Fabrication Facility (MOX) from $399,628,000 to $388,223,000.

[c] Excess FY 2003 construction funds in the amount of $18,340,920 are proposed to be reprogrammed from the HEU Blend Down Project to the Pit Disassembly and Conversion Facility (PDCF) and Mixed Oxide Fuel Fabrication Facility (MOX) Russianization.

[d] $29,000,000 is proposed to be reprogrammed to the Pit Disassembly and Conversion Facility construction project which increases the FY 2004 amount from $13,520,000 to $42,520,000.

[e] $8,395,920 is proposed to be reprogrammed to the Russian Materials Disposition program, which increases the FY 2004 amount from $46,975,000 to $55,370,920.

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
Fissile Materials Disposition...............	649,000	661,000	673,000	685,000	697,000	3,365,000

FY 2003 Execution

(dollars in thousands)

	FY 2003 Approp	General Reduction	Rescission	Supplement	Reprogram-ming	Comp Adjustment	Current FY 2003 Comparable
Fissile Materials Disposition..........	384,000	0	- 2,472	0	0	0	381,528

Description

Eliminate surplus Russian plutonium and surplus U.S. plutonium and HEU.

Benefits to Program Goal 02.47.00.00 Fissile Materials Disposition

Within the Fissile Materials Disposition program, four key areas each make unique contributions to Program Goal 02.47.00.00. Two of the four areas, U.S. Plutonium Disposition and Russian Materials Disposition, are coordinated efforts to eliminate 68 metric tons of U.S. and Russian surplus weapons-grade plutonium, in accordance with a September 2000 U.S.-Russia Plutonium Management and Disposition Agreement and Congressional direction to conduct both disposition programs (U.S. and Russia) in parallel. The U.S. Uranium Disposition subprogram objective, the third key area, is to make the 174 metric tons of the U.S. HEU that have been declared surplus non-weapons-usable, primarily by down-blending it to low-enriched uranium (LEU). To the extent practical, the program seeks to recover the economic value of the material by using the resulting LEU as reactor fuel. Three separate disposition projects (Off-Specification HEU Blend-down, Transfer to USEC, and Research Reactor Fuels) are being implemented today, and additional projects are being planned. The Construction subprogram, the final key area, is responsible for building the facilities needed to accomplish the Fissile Materials Disposition mission. These facilities include the Pit Disassembly and Conversion Facility and the Mixed Oxide Fuel Fabrication Facility. The HEU Blend Down Facility construction was completed in FY 2003.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
There were no related targets.	There were no related targets.	Developed a plan for U.S. and Russian plutonium disposition that is politically, fiscally, and technically feasible, and obtain White House approval. (MET GOAL)	Complete Title II (detailed) design of the Mixed Oxide Fuel Fabrication Facility for the disposition of excess US weapons-grade plutonium, and commence down blending of off-specification highly enriched uranium at the Savannah River Site. (MET LESS THAN 80% OF TARGET)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Percentage of the design and construction of the Pit Disassembly and Conversion Facility (PDCF) completed	Completed 60% of the detailed design of the U.S. Pit Disassembly and Conversion Facility.	Complete 85% of the detailed design of the U.S. Pit Disassembly and Conversion Facility.	Complete 100% of the detailed design of the U.S. Pit Disassembly and Conversion Facility. Begin design of PDCF Waste Solidification Building. Accomplish all site preparation activities, including site clearing, grading, installation of utilities and installation of infrastructure support.	Begin construction of the U.S. Pit Disassembly and Conversion Facility WSB. Award construction management contract for WSB.	* Continue construction of the U.S. Pit Disassembly and Conversion Facility WSB.	* Continue construction of the U.S. Pit Disassembly and Conversion Facility WSB. Award construction management contract for PDCF complex.	*Complete construction of U.S. Pit Disassembly & Conversion Facility WSB. Start Construction of PDCF complex.	EOY FY 2013
Percentage of the design and construction of the MOX Fuel Fabrication Facility completed.	Completed 75% of the detailed design of the U.S. MOX Fuel Fabrication Facility.	Complete the last 25% of the U.S. MOX Fuel Fabrication Facility detailed design (total of 100% complete).	* Begin site preparation and construction of the U.S. MOX facility and initiate procurement of long lead equipment.	*Continue the construction of the U.S. MOX Fuel Fabrication Facility.	*Continue the construction of the U.S. MOX Fuel Fabrication Facility.	*Continue the construction of the U.S. MOX Fuel Fabrication Facility.	*Complete the construction of the U.S. MOX Fuel Fabrication Facility	FY 2009

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Amount of HEU shipped to the United States Enrichment Corporation (USEC) for down-blending. (EFFICIENCY MEASURE)	Processed the equivalent of 11MT @40% of surplus HEU for shipment to USEC.	Ship an additional 11MT of surplus HEU to USEC for down-blending to LEU. A grand total of 45MT has been shipped.	Complete U.S. 50 MT HEU shipments to USEC. Begin shipments of compensation HEU to USEC.	Complete shipments of compensation HEU to USEC.	N/A	N/A	N/A	FY 2006
Amount of off-specification HEU down-blended.	Completed capital improvements at SRS for off-specification HEU down-blending and deliver resulting LEU and surplus HEU to TVA (equivalent to ~2.4MT of HEU).	Down-blend off-specification HEU at SRS and deliver resulting LEU and surplus HEU to TVA (equivalent to ~ 9.0MT of HEU for a cumulative total of 12.7 MT).	Down-blend off-specification at SRS and deliver resulting LEU and surplus HEU to TVA (equivalent to ~ 9.0MT of HEU for a cumulative total of 21.7 MT).	Down-blend off-specification HEU at SRS and deliver resulting LEU and surplus HEU to TVA (equivalent to ~ 6.0MT of HEU for a cumulative total of 27.7 MT).	Complete U.S. HEU/LEU shipments to TVA.	N/A	N/A	FY 2007
Russianize the design and construct the MOX Fuel Fabrication Facility in Russia.	Finalized decisions on the technical path forward for disposing of surplus Russian weapon-grade plutonium. Began and completed 10% of the Russianization of U.S. MOX facility design.	Complete 60% of the Russianization of the design. Begin characterization of Russian MOX site.	Complete 100% Russianization of the U.S. MOX Fuel Fabrication Facility. Complete 100% characterization of Russian MOX site. Begin site preparation and construction of the Russian MOX Fuel Fabrication Facility.	Complete 40% of the construction of the Russian MOX Fuel Fabrication Facility.	Complete 80% construction of the Russian MOX Fuel Fabrication Facility.	Complete 100% construction of the Russian MOX Fuel Fabrication Facility.		FY 2008

* Uncertainties associated with the international contributions to the Russian program together with Congressional requirements for parallel progress in both nations make estimation of key schedule milestones inappropriate at this time. The targets in 2004 and beyond assume the issue of liability will be resolved by April 1, 2004.

Detailed Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Reactor-Based Technologies	**57,400**	**36,750**	**38,600**

U.S. Plutonium Disposition

DOE is responsible for disposing of 34 metric tons of U.S. surplus weapons grade plutonium, in accordance with a September 2000 U.S.-Russia Plutonium Management and Disposition Agreement and Congressional direction to conduct both disposition programs (U.S. and Russia) in parallel. Two key facilities will be built at the Savannah River Site: a Pit Disassembly and Conversion Facility, which will primarily disassemble nuclear weapons pits and convert the resulting plutonium metal to an oxide form, and a MOX Fuel Fabrication Facility which will mix the plutonium oxide with depleted uranium oxide to produce mixed oxide (MOX) fuel for subsequent irradiation in existing domestic reactors.

Technical work on the design and licensing of the U.S. plutonium disposition facilities to be located at the Savannah River Site (SRS) has progressed to the point that the DOE is ready to start construction of the Mixed Oxide Fuel Fabrication Facility in May of FY 2005. Equipment procurement will be initiated in FY 2005. However, the Congressional requirement that both the U.S. and Russian program proceed in parallel may impact this schedule (see section dealing with the Russian Fissile Material Disposition).

Reactor-Based Technologies **57,400** **36,750** **38,600**

Reactor Based Technologies activities include work necessary to convert weapons grade plutonium oxide into finished MOX fuel assemblies to be irradiated to the spent fuel standard in commercial reactors.

As part of fuel qualification activities, continue the implementation of the Lead Assembly (LA) work, including initiation of fuel fabrication and completion of the fabrication and insertion of lead assemblies into a mission reactor. Continue fuel transportation and packaging activities, including submitting certification documents to the Nuclear Regulatory Commission (NRC). Develop information and responses to NRC questions to assure NRC approval of the operating license for the MOX FFF, continue modifications to the commercial nuclear reactors, complete irradiation of last test specimens, and perform the bulk of post-irradiation examination of all the test specimens. Begin operations planning activities in support of the MOX FFF, including recruiting, training, manual and procedure development, and personnel costs.

The increase in FY 2005 relative to FY 2004 is due to the increased costs for expansion of operational support levels as the design effort matures, partially offset by the decreased costs relating to the completion of the fabrication and insertion of lead assemblies into a mission reactor.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Pit Disassembly and Conversion....................................	**35,000**	**33,350**	**9,300**

A demonstration system, Automated Recovery and Integrated Extraction System (ARIES), is currently operating at LANL to demonstrate the technology and the capability to disassemble various pit types. Complete hot acceptance testing for integrated demonstration of pit disassembly technology in the ARIES system and limited demonstration of the ARIES technology. Continue development of Highly Enriched Uranium decontamination, material characterization, hydride/dehydride, packaging system, non-destructive assay (NDA), and automation.

The decrease is primarily due to reduction of integrated demonstration activities at LANL.

Immobilization and Associated Processing	**1,400**	**0**	**0**

Completed closeout activities associated with the Plutonium Immobilization Project in FY 2003.

Total, U.S. Plutonium Disposition	**93,800**	**70,100**	**47,900**

U.S. Uranium Disposition

Highly Enriched Uranium..	**81,372**	**92,640**	**95,500**

The objective of the surplus Highly Enriched Uranium (HEU) Disposition Program is to make the 174 metric tons of the U.S. HEU that have been declared surplus non-weapons-usable, primarily by down-blending it to LEU. To the extent practical, the program seeks to recover the economic value of the material by using the resulting LEU as reactor fuel. Three separate disposition projects (Off-Specification HEU Blend-down, Transfer to USEC, and Research Reactor Fuels) are being implemented today, and additional projects are being planned.

- Off-Specification HEU Blend Down Project: Continue final processing, down-blending, and LEU loading operations at SRS for shipments to Nuclear Fuel Services (NFS) for eventual use in Tennessee Valley Authority (TVA) nuclear reactors; HEU alloy shipments from SRS to NFS; and HEU metal and alloy shipments from Y-12 to NFS.

- Program Management, Inventory Management, Technical Support and Special Studies: Continue surplus HEU planning, project management, HEU disposition technical support and special studies, and inventory management.

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

- Shipping Containers: Receive certification for ES-2100 shipping package containing HEU oxide contents and procure additional containers and/or container components suitable for HEU oxide contents in August 2003. Develop the design and submit the license application for the ES-3100 container in FY 2004. Receive ES-3100 certification and procure production units in FY 2005.

- USEC 50 MT Transfer Project: Continue shipping surplus HEU (equivalent of 11 MT @ 40% enrichment level) from the Y-12 Plant to USEC for down blending to commercially usable LEU.

- Unallocated Material Planning, Packaging, Shipment, and Disposition: Complete preparations for packaging and shipment of Idaho National Engineering and Environmental Laboratory (INEEL) off-specification HEU (i.e., denitrator oxide). Continue preparations for other unallocated material projects.

The increase is due to increased work-scope related to the off-specification HEU Blend Down Project, including TVA off-specification project integration activities, additional Y-12 HEU shipments, increased SRS down-blending and LEU and HEU shipment operations, laboratory analyses of product material, payments to TVA for Uranium/Aluminum ingot processing, and vendor waste returns. The increase is also due to unallocated material efforts, including preparations for packaging, shipment, and disposition of unallocated materials.

Note: FY 2003 operating funds in the amount of $7,650,000 are proposed for reprogramming from the HEU Blend Down Project, 01-D-407.

	FY 2003	FY 2004	FY 2005
Total, U.S. Uranium	**81,372**	**92,640**	**95,500**

Supporting Activities

	FY 2003	FY 2004	FY 2005
Surplus Plutonium Storage	**9,800**	**17,305**	**27,900**

Surplus Plutonium Storage provides safe storage configurations for surplus plutonium at the Pantex Plant and LANL until the materials are moved to Savannah River Site (SRS) for disposition. Funded activities include surveillance and maintenance operations, radiation safety support and training, and thermal monitoring. The new surplus nuclear weapon pit shipping container will be used to ship surplus pits from the Pantex Plant to the planned Pit Disassembly and Conversion Facility (PDCF) at SRS.

In FY 2005, continue storing surplus plutonium at the Pantex Plant and LANL. Continue to package surplus pits for shipment from the Pantex Plant to LANL for the ARIES demonstration system (the pits are needed as feed material to validate equipment for the PDCF). Begin certifying and fabricating, the new surplus pit shipping containers.

The increase is due to starting the testing, certification, and fabrication of the new surplus pit storage shipping containers.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Surplus HEU Storage	**6,000**	**6,000**	**6,000**

In FY 2001 operating costs associated with storing 85 MT of surplus HEU residing at the Y-12 Plant were transferred from DP to the OFMD program. Storage requirements will continue until the material is moved to the disposition (blending) site (begun in FY 2000 and estimated to end in FY 2020). Storage operations include planning, providing and maintaining storage facilities, limited repackaging of material as necessary for safety, and surveillance for surplus HEU materials and facilities.

For FY 2005, continue to store 85 MT of surplus HEU at the Y-12 Plant.

NEPA	**1,223**	**750**	**1,500**

NEPA activities include preparing and reviewing Environmental Assessments (EA), EISs and supplemental NEPA analyses for fissile material storage and disposition activities. In addition, NEPA efforts include preparing supplements and amended RODs required to support changes to the U.S. program.

In FY 2005, the existing environmental analyses will need to be updated because detailed designs for the plutonium facilities have advanced significantly.

Common Technologies and Integration	**4,900**	**5,900**	**5,900**

In September 2000, the U.S. and Russia signed the Plutonium Management and Disposition Agreement (PMDA), obligating the parties to each dispose of 34 MT of plutonium withdrawn from their respective defense programs. The PMDA requires that the parties agree in writing to Monitoring and Inspection (M&I) procedures that would provide confidence that each party is meeting its obligations under the Agreement. Reaching such an agreement requires detailed technical analysis and policy level negotiations among the U.S., Russia and the IAEA.

Support U.S. participation in government-to-government technical negotiations with Russia to develop a detailed monitoring and inspection regime, which will be implemented at plutonium disposition facilities in both countries. Support development of guidance to U.S. design engineers on monitoring and inspection specifications, which need to be included in the design of the two plutonium facilities. The Agreement requires that a monitoring and inspection regime must be completed in writing prior to beginning construction of industrial scale disposition facilities in the Russian Federation. Support other efforts common to both the MOX FFF and PDCF continues in FY 2005, such as program level engineering and analysis.

Total, Supporting Activities	**21,923**	**29,955**	**41,300**

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Construction

99-D-141, Pit Disassembly and Conversion Facility	**34,775**	**13,520**	**32,300**

The Pit Disassembly & Conversion portion of the Pit Disassembly & Conversion Facility (PDCF) project is a complex consisting of a hardened building (that will contain the plutonium processes) and conventional buildings and structures (which will house support personnel, systems, and equipment). The plutonium processing building will be a material access area of approximately 115,000 square feet and house the following key systems: pit shipping, receiving, assay and storage; pit plutonium metal extraction and conversion to oxide; plutonium oxide packaging, assay, storage, and shipment.

The Waste Solidification Building, located on the same site, is a 45,800 square feet, single story structure with a high bay made up of a combination of hardened (concrete) and conventional steel structures. The building houses waste treatment and cementation equipment.

The increase is due to beginning the detailed design of the Waste Solidification Building, long lead procurement and site clearing for the Pit Disassembly & Facility at SRS.

Note: $29,000,000 is proposed to be reprogrammed to the Pit Disassembly and Conversion Facility construction project which increases the FY 2004 amount from $13,520,000 to $42,520,000.

The design cost for the PDCF has increased as a result of new scope and requirements, unanticipated additional work to complete the design, and schedule extensions caused by late process design information. This is partially related to the new need to reflect a self-contained waste processing capability.

99-D-143, Mixed Oxide Fuel Fabrication Facility	**92,401**	**399,628**	**368,000**

A Mixed Oxide Fuel Fabrication Facility (MOX FFF) will provide the U.S. with the capability to convert plutonium oxide derived from surplus weapons grade plutonium stocks to MOX fuel suitable for use in the U.S. commercial nuclear reactors. Subsequent disposal of the spent fuel will be carried out in accordance with the Nuclear Waste Policy Act. A contract was awarded to a private consortium (Duke Engineering Services, COGEMA, Inc. and Stone & Webster (DCS) on March 22, 1999). The contract requires DCS to design a MOX FFF to be built at a DOE site (SRS) and to be licensed by the Nuclear Regulatory Commission. Options built into the contract allow for construction and operation of the MOX facility.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Because the start of construction has slipped from FY 2004 to FY 2005, some monies destined for expenditure during FY 2004 will not be spent until FY 2005. This enabled the reduction of the funding requirement in FY 2005.

Note: FY 2004 construction funds in the amount of $11,405,000 are proposed to be reprogrammed from the MOX Fuel Fabrication Facility Project, 99-D-143, which reduces the FY 2004 amount from $399,628,000 to $388,223,000.

01-D-407, Highly Enriched Uranium (HEU)................	**23,476**	**0**	**0**

In an aftermath of the Cold War, significant quantities of weapons-usable highly enriched uranium (HEU) have become surplus to national defense needs both in the U.S. and Russia. The Department issued a Record of Decision (ROD) on the Disposition of Surplus HEU Final Environmental Impact Statement (EIS) in July 1996. The ROD sets forth DOE's decision to disposition surplus HEU by blending it down to low-enriched uranium (LEU) and recovering its economic value by using it as fuel in power reactor, where practicable. The 174 MT of surplus HEU includes a quantity of "off specification" HEU that is a product of DOE uranium reprocessing operations.

This project was completed in FY 2003 and experienced a cost under-run because of accelerated work schedule, changes in design philosophy, elimination of redundant security requirements, recycling of equipment, a proactive/aggressive design/construction team, and fewer equipment replacements than anticipated.

Note: FY 2003 construction funds in the amount of $18,340,920 are proposed to be reprogrammed from the HEU Blend Down Project, 01-D-407.

Total, Construction...	**150,652**	**413,148**	**400,300**
Total, U.S. Surplus Material Disposition......................	**347,747**	**605,843**	**585,000**

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

Russian Fissile Materials Disposition

Russian Plutonium Disposition (funds spent in Russia)

The 1998 U.S.-Russia Joint Scientific and Technical Cooperation Agreement, which provided limited liability protection for technical work (pre-construction) in support of plutonium disposition, expired in July 2003. Senior officials in both countries are now working to develop satisfactory liability provisions for the September 2000 U.S.-Russia Plutonium Management and Disposition Agreement. This Agreement covers design, construction and operation of facilities required for plutonium disposition.

Given that preliminary site characterization work in Russia will not start until the spring of 2004 and the U.S. and Russia must exchange detailed technical engineering data to Russianize the design of the MOX Facility, the start of construction in both countries will now begin in FY 2005.

As specified in the U.S.-Russia Plutonium Management and Disposition Agreement, funding from new budget authority continues the work initiated in FY 2002 and 2003. As soon as the U.S. and Russia resolve the liability issues and inform Congress of the revised path forward, the available prior year balances mandated for work in Russia as specified will be obligated**.**

The Plutonium Conversion and MOX Fuel Fabrication activities and budget, which appeared under this heading in previous years, have been consolidated and placed in a new task entitled “Implementation of MOX FFF Design”. Given that Russia has accepted the offer of the design of the U.S.MOX Facility prepared by Duke Engineering Services, COGEMA, Inc. and Stone & Webster (DCS), this task includes both a Russian and a U.S. component.

VVER-1000 Reactors..	**1,700**	**2,500**	**3,500**

This effort involves modifying Russian VVER-1000 power reactors to utilize MOX fuel. FY 2005 efforts include: develop reactor physics data for insertion of MOX fuel lead test assemblies. Complete the MOX core design and design for reactor modifications for the lead test assemblies. Upgrade the VVER-1000 safety basis and submit MOX fuel licensing documents to GAN. Obtain licenses for experimental fuel and prepare for the insertion of the lead test assemblies.

The increase will be used to support the modifications to the VVER-1000 reactors for use of MOX, and preparation of licensing documents.

BN-600 Reactor	**1,300**	**2,500**	**3,500**

This effort involves converting the BN-600 fast neutron breeder reactor into a net burner of plutonium. FY 2005 efforts include: completing the BN-600 uranium core with reflector/shield safety analyses and submit the licensing package to GAN for approval of the blanket replacement. Complete the design upgrade of photo-neutron source and control/shutdown rods and other plant modifications. Fabricate reflector/shield components.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

The increase will be used to support the modifications to the BN-600 reactor and preparation of licensing documents.

Licensing and Regulation/Other Program Support	**850**	**2,000**	**2,800**

This involves the development of the licensing process for the plutonium disposition program in Russia. FY 2005 efforts include: complete the 12 high priority regulations needed for licensing plutonium disposition activities. Accomplish expert reviews of license applications for: MOX fuel fabrication facility construction, VVER-1000 lead test assemblies, and BN-600 hybrid MOX core.

The increase is due to reviews of license applications.

Packaging, Transportation, and Storage	**1,150**	**1,500**	**2,100**

This effort is to assess existing Russian infrastructure and define needs for packaging, storage and transportation of plutonium containing materials and spent MOX fuel, and waste treatment and disposal required to implement plutonium disposition in Russia. FY 2005 efforts include: complete design and commence modification of plutonium shipping containers and shipping casks to meet current regulations. Commence upgrade and re-certification of shipping casks for VVER-1000 and BN-600 new MOX fuel. Complete waste treatment building construction drawings, obtain construction license, commence construction and issue purchase orders for major equipment with long lead times. Commence technical and economic feasibility study for MOX dry spent fuel storage facility.

The increase is due to modification and certification of shipping containers and shipping casks, preparation of waste treatment facility licensing documents and mobilization to start construction.

Implementation of MOX Fuel Fabrication Facility Design	**8,260**	**15,000**	**20,600**

In FY 2003, the Russians agreed to utilize the design of the enhanced U.S. MOX Fuel Fabrication Facility (FFF) in Russia. The Russian use of the U.S. design will help to ensure parallelism between the two programs, save money and time by avoiding the need to design Russian facilities for MOX fuel fabrication separately, produce cost savings from procuring items of similar design for both programs, and provide for greater material security. TVEL manages the Russian nuclear fuel industry, and has been appointed by MINATOM to lead the Russian MOX fuel effort. To streamline the Russian plutonium disposition program and realize efficiency from the involvement of Russian fuel industry manager TVEL, the program has been restructured to consolidate the previously separate Russian Plutonium Disposition activities involving plutonium conversion and MOX fuel fabrication into one new Russian task and one new U.S. support task, each titled: Implement the MOX Fuel Fabrication

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

Facility. TVEL and DCS, the US MOX FFF designer, are responsible for "Russianizing" the detailed design of the U.S. facility so that it conforms to Russian regulations and is adapted to local site conditions. FY 2005 activities include: completing "Russianization" of the MOX FFF design, initiating construction of the MOX FFF and issuing purchase orders for major equipment with long lead times. Continue the design of the MOX FFF training facility.

The increase is due to the progression from site preparation to beginning of construction of the Russian MOX FFF. (Total funding for the construction will be predominantly provided by international contributors and unobligated balances from the FY 1999 Supplemental Appropriation for the Russian plutonium disposition program).

	FY 2003	FY 2004	FY 2005
Total, Russian Plutonium Disposition...........................	**13,260**	**23,500**	**32,500**

U.S. Design, Engineering, and Support (funds spent in the U.S.)

	FY 2003	FY 2004	FY 2005
U.S. Technical Support..	**9,900**	**8,875**	**9,000**

Continue to provide technical support and oversight, as directed, of research and development activities for plutonium disposition in Russia. Activities for FY 2005 include: verify results of Russian physics codes for insertion of MOX fuel lead test assemblies. Review safety analyses for reactor operation with MOX fuel. Check the designs and cost estimates for reactor modifications and the waste treatment building. Assure redesign and certification of plutonium shipping containers and MOX fuel shipping casks. Complete post irradiation examination of MOX test bundles at the Canadian Chalk River research reactor. Manage the MOX FFF design and technology transfer between DCS and TVEL. Perform reviews, as required, of other Russian designs and work products. The Nuclear Regulatory Commission will support the Russian nuclear regulator GAN in the formulation of licensing documents and conduct licensing reviews of Russian draft regulations supported by the U.S. as well as provide training and licensing support to GAN.

	FY 2003	FY 2004	FY 2005
Total, U.S. Design, Engineering Support......................	**9,900**	**8,875**	**9,000**
Implementation of MOX Fuel Fabrication Facility Design..	**8,621**	**13,600**	**21,500**

With the Russian agreement in FY 2003 to apply the US MOX Fuel Fabrication Facility design to Russia and the MINATOM decision to appoint TVEL (the organization managing the Russian nuclear fuel industry) to lead the Russian MOX fuel effort, the program has been restructured to consolidate all fuel production activities. The previous separate activities of conversion and fuel production have been consolidated into this new U.S. support task: Implement the MOX Fuel Fabrication Facility. The US MOX FFF designer, DCS (a consortium of Duke, Cogema, Stone & Webster) has been tasked to transfer the design to TVEL and provide technical support to "Russianize" the MOX FFF design so that

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

it conforms to Russian regulations and is adapted to local site conditions. DCS will also provide technical assistance in the development of a conversion process. In FY 2005: Adapt the U.S. MOX FFF design to Russian standards and site conditions, translate design documents into Russian, and complete the transfer of the U.S. design to Russia.

This increase is due to continuing the Russianization of the U.S. design to support construction of the Russian MOX FFF.

Note: $8,395,920 is proposed to be reprogrammed to the Russian Materials Disposition program, which increases the FY 2004 amount from $46,975,000 to $55,370,920.

	FY 2003	FY 2004	FY 2005
Mandated Russian Surplus Plutonium Dispositions (funds spent in Russia)	**64,000**	**0**	**0**
Advanced Reactor Technology	**2,000**	**1,000**	**1,000**

The plutonium fueled Gas Turbine – Modular Helium Reactor (GTMHR) is being developed in Russia as a potential option for expanding the surplus weapon-grade plutonium disposition capacity above the initial 34 MT. Research, development and testing of GTMHR fuel and nuclear reactor components will be performed by various Russian organizations to verify technical aspects of the design. In FY 2005: Continue minimal work in Russia to continue fabrication of test fuel at the Bench Scale Fuel Fabrication Facility at Bochvar.

	FY 2003	FY 2004	FY 2005
Subtotal, Russian Surplus Fissile Materials Disposition	**97,781**	**46,975**	**64,000**
Less Use of Prior-Year Balances [a]	**-64,000**	**0**	**0**
Total, Russian Surplus Fissile Materials Disposition	**33,781**	**46,975**	**64,000**
Total, Fissile Materials Disposition	**381,528**	**652,818**	**649,000**

[a] Includes $64,000,000 appropriated in the FY 1999 Supplemental Appropriation for the Russian Plutonium Disposition program ($200,000,000). These balances plus remaining balances will be spent in the Russian Federation in accordance with a detailed program execution plan to be provided to Congress.

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
U.S. Surplus Fissile Materials Disposition	
U.S. Plutonium Disposition	
▪ **Reactor-Based Technologies**	
The increase is due to expansion of operational support levels as the design effort matures, partially offset by the decreased costs relating to the completion of the fabrication and insertion of lead assemblies into a mission reactor............................	+ 1,850
▪ **Pit Disassembly and Conversion**	
The decrease is primarily due to completion of the hot acceptance testing for integrated demonstration at LANL	- 24,050
Total, U.S. Plutonium Disposition	- 22,200
U.S. Uranium Disposition	
▪ **Highly Enriched Uranium (HEU)**	
The increase is due to increased work-scope related to the off-specification HEU Blend Down Project, including TVA off-specification project integration activities, additional Y-12 HEU shipments, increased SRS down-blending and LEU and HEU shipment operations, laboratory analyses of product material, payments to TVA for Uranium/Aluminum ingot processing, and vendor waste returns. The increase is also due to unallocated material efforts, including preparations for packaging, shipment, and disposition of unallocated materials	+ 2,860
Total, U.S. Uranium Disposition...	+ 2,860
▪ **Supporting Activities**	
Surplus Plutonium Storage	
The increase is due to starting the testing, certification, and fabrication of the new surplus pit storage shipping containers.	+ 10,595

	FY 2005 vs. FY 2004 ($000)
▪ **NEPA**	
In FY 2005, the existing environmental analyses will need to be updated because detailed designs for the plutonium facilities have advanced significantly	+ 750
Total, Supporting Activities	+ 11,345
Subtotal, U.S. Surplus Fissile Materials Disposition	- 7,995
Total, U.S. Plutonium Disposition (O&M)	- 10,855
Total, U.S. Uranium Disposition(O&M)...	+ 2,860
▪ **Construction**	
99-D-141 Pit Disassembly and Conversion, SRS. The increase is due to beginning the detailed design of the Waste Solidification Building, long lead procurement and site clearing for the Pit Disassembly & Facility at SRS	+ 18,780
99-D-143 Mixed Oxide Fuel Fabrication Facility, Because the start of construction has slipped from FY 2004 to FY 2005, some monies destined for expenditure during FY 2004 will not be spent until FY 2005. This enabled the reduction of the funding requirement in FY 2005	- 31,628
Total, U.S. Surplus Materials Disposition, Construction	- 12,848
Total, U.S. Plutonium Disposition	- 23,703
Total, U.S. HEU Disposition...	+ 2,860
Total, U.S. Surplus Fissile Materials Disposition...	- 20,843

	FY 2005 vs. FY 2004 ($000)
Russian Surplus Fissile Materials Disposition	
Russian Fissile Materials Disposition	
Russian Plutonium Disposition (funds spent in Russia)	
▪ **VVER-1000 Reactors**	
The increase will be used to support the modifications to the VVER-1000 reactors for use of MOX, and preparation of licensing documents	+ 1,000
▪ **BN-600 Reactor**	
The increase will be used to support the modifications to the BN-600 reactor and preparation of licensing documents	+ 1,000
▪ **Licensing and Regulation/Other Program Support**	
The increase is due to reviews of license applications	+ 800
▪ **Packaging, Transportation, and Storage**	
The increase is due to modification and certification of shipping containers and shipping casks, and preparation of waste treatment facility licensing documents and mobilization to start construction	+ 600
▪ **Implement MOX Fuel Fabrication Facility (FFF) Design**	
The increase is due to the progression from site prep to beginning of construction of the Russian MOX FFF. (Total funding for the construction will be predominantly provided by international contributors and unobligated balances from the FY 1999 Supplemental Appropriation for the Russian plutonium disposition program).	+ 5,600
▪ **U.S. Design, Engineering, & Support (funds spent in the U.S.)**	
Implementation of MOX Fuel Fabrication Facility (FFF) Design (funds spent in the U.S.)	+ 125
The increase is due to the increasingly detailed Russian adaptation of the US MOX FFF	+ 7,900
Total, Russian Surplus Fissile Materials Disposition	+ 17,025
Total Funding Change, Fissile Materials Disposition	**- 3,818**

Capital Operating Expenses and Construction Summary

Capital Operating Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Capital Equipment	0	0	3,900	+ 3,900	100.0%
Total, Capital Operating Expenses.........	0	0	3,900	+ 3,900	100.0%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Approp-riations	FY 2003	FY 2004	FY 2005	FY 2005 Over Target	Unapprop-riated Balance
99-D-141, Pit Disassembly Conversion Facility	TBD	58,707	34,775	13,520 [a]	32,300	0	TBD
99-D-143, MOX Fuel Fabrication Facility.....	TBD	66,318	92,401	399,628 [b]	368,000	0	TBD
01-D-407, Highly Enriched Uranium (HEU) Blend Down Project.......................	80,226	TBD	20,476 [c]	0	0	0	0
Total, Construction.....			150,652	413,148	400,300	0	

[a] $29,000,000 is proposed to be reprogrammed to the Pit Disassembly and Conversion Facility construction project which increases the FY 2004 amount from $13,520,000 to $42,520,000.

[b] FY 2004 construction funds in the amount of $11,405,000 are proposed to be reprogrammed from the MOX Fuel Fabrication Facility Project to the Pit Disassembly and Conversion Facility (PDCF). This reduces the FY 2004 amount for the Mixed Oxide Fuel Fabrication Facility (MOX) from $399,628,000 to $338,223,000.

[c] Excess FY 2003 construction funds in the amount of $18,340,920 are proposed to be reprogrammed from the HEU Blend Down Project to the Pit Disassembly and Conversion Facility (PDCF) and Mixed Oxide Fuel Fabrication Facility (MOX) Russianization.

99-D-141, Pit Disassembly and Conversion Facility
Savannah River Site, Aiken, South Carolina

Significant Changes

- The title of this project has been changed because design and construction activities are included within this line item in addition to Title I&II as the original project title implied. Therefore, the reference to Title I&II design has been removed.
- Design Cost for the Pit Disassembly and Conversion (99-D-141-01) has increased from $116,800,000 to $160,200,000 as a result of new scope and requirements, unanticipated additional work to complete the design, schedule extensions caused by late process design information, and to provide for additional contingency.
- The Project Performance Baseline for the Pit Disassembly and Conversion Facility (PDCF) will be established in FY 2004 instead of 3Q FY 2003.
- The scope of services for Construction Management that previously appeared in Section 6 of the FY 2004 Data Sheet has been reassigned as a part of the Design Task. The scope of services encompasses constructability reviews to ensure a high confidence in the constructability of the PDCF design.
- The Waste Solidification Building (WSB) facility has been added to this project as an outcome to the requirements and design of the Pit Disassembly and Conversion Facility (PDCF).

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2000 Budget Request *(A-E and technical design only)*	2Q 1999	4Q 2001	2Q 2001	4Q 2004	[a]	[a]
FY 2001 Budget Request *(Preliminary Estimate)*	3Q 1999	1Q 2002	1Q 2002	3Q 2005	[a]	[a]
FY 2002 Budget Request *(Preliminary Estimate)*	3Q 1999	TBD	TBD	TBD	[a]	[a]
FY 2003 Budget Request *(Preliminary Estimate)*	3Q 1999	1Q 2004	TBD	TBD	[a]	[a]
FY 2004 Budget Request *(Preliminary Estimate [c])*	3Q 1999	2Q 2004	TBD [b]	TBD [b]	TBD [a]	TBD [a]
FY 2005 Budget Request *(Current Estimate)*	3Q 1999	4Q 2005	2Q 2005 [b]	TBD [d]	TBD [d]	TBD [d]

[a] Total Estimated Cost (TEC) and Total Project Cost (TPC) estimates will be determined when the Project Performance Baseline is established.

[b] *The Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site* dated February 15, 2002, cites a Physical Construction Start date of FY 2006, and a Physical Construction Completion date of FY 2009 these dates will be reviewed in the FY2004 Report to Congress.

[c] The FY2004 Budget Request was inadvertently shown as "Performance Baseline" instead of Preliminary Estimate.

[d] Plutonium Disposition Program adjustments for FY 2005 and outyears will impact cost and schedule of the PDCF project. Physical construction complete, TEC, and TPC estimates will be determined when Project Performance Baseline is established

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
1999	20,000	20,000	211
2000	18,751	18,751	13,449
2001	19,956	19,956	17,834
2002	11,000	11,000	22,377
2003	34,657 [a]	34,657[a]	42,662
2004	13,520 [b]	13,520	20,427
2004	29,000 [c]	29,000	29,000
2005	32,300	32,300	33,368
2006	35,400	35,400	35,518
2007	60,000	60,000	60,000
2008	129,000	129,000	129,000
2009	130,000	130,000	130,000

3. Project Description, Justification and Scope

Pit Disassembly and Conversion Facility (PDCF):

This project supports the NNSA strategic goal to detect, prevent, and reverse the proliferation of weapons of mass destruction and implements the NNSA strategy to protect or eliminate weapon-usable nuclear material. This project is comprised of two subprojects; 99-D-141-01, Pit Disassembly and Conversion Facility and 99-D-141-02, Waste Solidification Building. The Pit Disassembly and Conversion Facility (PDCF) Project provides the capability to convert weapons-grade surplus plutonium metal and the plutonium in surplus pits (nuclear weapons) to a form that can be fabricated into MOX for irradiation in United States commercial nuclear reactors. The plutonium contained in the irradiated MOX fuel is considered to be non-weapons-usable. The Waste Solidification Building provides the capability to treat waste from the Pit Disassembly and Conversion Subproject and the MOX FFF for ultimate disposal. Details of each Subproject are provided.

Subproject 01-Pit Disassembly and Conversion

The PDCF is a complex consisting of a hardened building (that will contain the plutonium processes) and conventional buildings and structures (which will house support personnel, systems, and equipment). The

[a] The original appropriation of $35,000,000 was reduced by $118,000 for use of prior year for the FY 2004 rescission included in P.L. 108-7 and $225,000 for the FY 2004 rescission included in P.L. 108-7.

[b] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission of .59 percent.

[c] $29,000,000 is proposed to be reprogrammed to the PDCF project which increases the FY 1004 amount from $13,520,000 to $42,520,000.

plutonium processing building will be a material access area of approximately 115,000 square feet and house the following key systems: pit shipment, receiving, assay and storage; pit plutonium metal extraction and conversion to oxide; and plutonium oxide packaging, assay, storage, and shipment. Also included are facilities for recovery, decontamination, and declassification of other special nuclear material and non-special nuclear material resulting from pit disassembly. The conventional buildings and structures, which do not contain any radioactive materials, requiring approximately 50,000 square feet, will house offices, change rooms, a central control station, waste treatment, packaging, storage, and shipment systems. The Plutonium Processing Building (PPB) is equipped with lag storage for incoming pit materials and storage for finished oxide. The facility is planned to be operational for 7 1/2 years after which it is expected to be decontaminated and decommissioned over a 3- to 4-year period.

The project consists of the following: design and construction of the buildings and structures; design, procurement, installation, testing, and start-up of equipment to disassemble pits and convert the plutonium from pits to oxide form; and associated supporting equipment, components, and systems. The facility will be constructed consistent with Nuclear Regulatory Commission (NRC) licensing standards but will not be licensed by the NRC.

Project Milestones:

FY1999:	Initiate Design	3Q
FY2005:	Complete Design	4Q
	Initiate Physical Construction	2Q[a]
FY2013:	Complete Physical Construction	TBD[b]

Waste Solidification Building (WSB):

Subproject 02- Waste Solidification Building

The Waste Solidification Building (WSB) scope consists of design, construction, procurement, installation, and startup testing of structures and equipment. The WSB is a non-reactor nuclear facility that will process radioactive liquid waste streams from the PDCF and MOX FFF into a solid form for ultimate disposal. The radioactive liquid wastes are composed of one high activity and two low activity streams. The high activity stream contains significant amounts of americium that is removed from the plutonium oxide during purification in the MOX FFF.

The WSB is to be constructed adjacent to the PDCF on the PDCF project site. The building is a 45,800 sq. foot, single story structure with a high bay made up of a combination of hardened (concrete) and conventional steel structures. A concrete-cell configuration is provided to process the high activity waste stream through the building. The conventional steel structure is composed of steel siding on structural steel members houses the low activity processes and support services. In addition, a material handling/storage pad is provided to store solid wastes produced in the WSB pending shipment. The complete facility consists of 3,600 sq. feet of hardened structure, 23,000 sq. feet of conventional structure and a 23,000 sq. foot material handling/storage pad. The major pieces of process equipment are tanks, evaporators, and cementation equipment.

Project Milestones: [a]

[b] Amounts and schedules to be determined when the performance baseline is established.

FY 2005:	Initiate Design	TBD
	Initiate Physical Construction	2Q
TBD:	Complete Design	TBD
FY2009:	Complete Physical Construction	TBD

4. Details of Cost Estimate [a]

Subproject 01-Pit Disassembly and Conversion	Current Estimate (dollars in thousands)	Previous Estimate (dollars in thousands)
Preliminary and Final Design Costs (Design, Drawing, and Specification)	107,300	116,800
Design Management Cost at 22% of above costs	33,300	116,800
Total Design Phase	140,600	TBD
Contingencies at approximately 12% of above costs	19,600	TBD
Design Phase	160,200	TBD
Construction and Procurement	TBD	TBD
Total Agency Requirement	TBD	TBD
Total Design Costs	160,200	TBD
Total Agency Requirement (Design)	160,200	TBD

Subproject 02-Waste Solidification Building		
Preliminary and Final Design Costs (Design, Drawing, and Specification)	18,300	N/A
Design Management Cost at 7% of TEC costs	1,800	N/A
Project Management Cost at 10% of TEC costs	2,600	TBD
Total, Design Phase	22,700	TBD
Contingencies at approximately 11.7% of above costs	3,000	TBD
Design Phase	25,700	TBD
Total Agency Requirement	25,700	TBD
Construction Management	TBD	TBD
Total Agency Requirement	25,700	TBD

[a] Amounts and schedules to be determined when the performance baseline is established.

5. Method of Performance

A cost plus fixed-fee contract for preliminary design and a cost plus award-fee contract for detailed design have been awarded for the PDCF. The procurement strategy includes an option for construction inspection services (Title III) for which a decision will be made during the Title II design phase. A purchase order for procurement of long-lead equipment fabrication will be issued approximately 1 to 2 years prior to start of construction.

The WSB design service is procured through the Savannah River M&O contract. A purchase order for procurement of long-lead equipment will be issued approximately one year prior to start of construction.

It is anticipated that a fixed-price construction contract will be awarded on the basis of competitive bidding.

6. Schedule of Project Funding [a] [b]

PDCF Project Costs

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Design Costs						
Design..	53,727	36,562	46,227	23,685	0	160,200
Total Design (Federal and Non-Federal)....	53,727	36,562	46,227	23,685	0	160,200
Construction and Procurement..................	0	0	0	1,500	TBD	TBD
PDCF Total TEC	53,727	36,562	46,227	25,185	TBD	TBD
Other Project Costs	130,300	31,600	33,500	16,300	TBD	TBD
Total Project Costs	184,027	68,161	79,727	41,485	TBD	TBD

WSB Project Costs

(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Design Costs						
Design..	0	6,100	3,200	8,183	8,217	25,700
Total Design (Federal and Non-Federal)....	0	6,100	3,200	8,183	8,217	25,700
Construction Management	0	0	0	0	TBD	TBD
Construction and Procurement..................	0	0	0	0	TBD	TBD
WSB Total TEC...	0	6,100	3,200	8,183	TBD	TBD
Total, Other Project Costs	0	0	TBD	TBD	TBD	TBD
Total Project Costs	0	6,100	TBD	TBD	TBD	TBD

[a] Amounts to be determined when the performance baseline is established.

[b] The Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site City a total operating cost of $718.2 Million without contingency and in FY 2001 dollars. For an operating period of 7.5 years and a contingency of 5%, the annual facility operating cost would be $100.5 Million in FY 2001 dollars.

7. Related Annual Funding Requirements [a][b]

	(FY 2009 dollars in thousands)	
	Current Estimate	Previous Estimate
Annual facility operating costs	TBD	TBD
Annual facility maintenance/repair costs	TBD	TBD
Programmatic operating expenses directly related to this facility	TBD	TBD
Utility costs	TBD	TBD
Total related annual funding (operating from FY 2009 through FY 2035)	TBD	TBD

[a] These figures are projections and will be determined when the performance baseline is established.

[b] The Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site City a total operating cost of $718.2 Million without contingency and in FY 2001 dollars. For an operating period of 7.5 years and a contingency of 5%, the annual facility operating cost would be $100.5 Million in FY 2001 dollars.

99-D-143, Mixed Oxide Fuel Fabrication Facility, Savannah River Site, Aiken, South Carolina

Significant Changes

The schedule for starting construction of Mixed Oxide Fuel Fabrication Facilities (MOX FFF) in the U.S. and Russia has been adjusted to allow time for resolution of issues regarding Russian tax exemptions and liability. Given the political realities and impacts of these issues, the earliest possible date that construction can begin on the two facilities is May 2005. Despite this delay in the start of construction, the NNSA has structured the program to minimize adverse impacts. The overall program and project costs will be updated in the Program's annual report to Congress.

This schedule adjustment will allow the U.S. to transfer the domestic MOX FFF design to Russia for use in processing Russian surplus plutonium. This approach was proposed to the Russians in April 2002 and accepted in December 2002. It eliminates the 2 to 3 years of time required for Russia to develop their own MOX facility design, and will, ultimately, minimize the cost and schedule of both programs. It will also allow the Congressional requirements for parallel progress in the U.S. and Russia to be met.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2000 Budget Request (A-E *and technical design only*)	2Q 1999	4Q 2001	1Q 2002	4Q 2005	[a]	[a]
FY 2001 Budget Request (*Preliminary Estimate*)	2Q 1999	3Q 2002	4Q 2002	1Q 2006	[a]	[a]
FY 2002 Budget Request (*Preliminary Estimate*)	2Q 1999	4Q 2002	2Q 2003	1Q 2007	[a]	[a]
FY 2003 Budget Request (*Preliminary Estimate*)	2Q 1999	4Q 2003	2Q 2004	4Q 2007	[a]	[a]
FY 2004 Budget Request (*Preliminary Estimate)..........*	2Q 1999	1Q 2004	2Q 2004[b]	4Q 2007[b]	1,622,000[a]	1,842,000[a]
FY 2005 Budget Request *(Current Estimate)*.................	2Q 1999	3Q 2004	3Q 2005[b]	2Q 2009 [b]	TBD[ab]	TBD[a]

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[a] Total Estimate Cost (TEC) and Total Project Cost (TPC) estimates will be updated when the Project Performance Baseline is established in FY 2004.

[b] *The Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site* dated February 12, 2002, cites a Physical Construction Start date of FY2004, a Physical Construction Completion date of FY 2007, and the first fabrication of MOX fuel in FY2008. These dates will be revised in the 2004 report to Congress.

2. Financial Schedule [a]

(Dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs [b] [c]
1999	28,000	9,600	2,545
2000	12,375	30,775	33,512
2001	25,943	25,943	29,938
2002	65,993	65,993	52,513
2003	92,088[d]	92,088[d]	81,709
2004	399,628[e]	399,628[e]	100,000
2004	(11,405)[f] g	(11,405)[f]	(11,405)[f]
2005	368,000	368,000	368,000
2006	330,000	330,000	472,125
2007	214,000	214,000	320,313
2008	140,000	140,000	172,362
2009	90,000	90,000	121,010

3. Project Description, Justification and Scope

Description and Scope

The MOX FFF will provide the U.S. with the capability to convert plutonium oxide derived from surplus weapons grade plutonium stocks to MOX fuel suitable for use in U.S. commercial nuclear reactors. Subsequent disposal of the spent fuel will be carried out in accordance with the Nuclear Waste Policy Act. A contract was awarded to a private consortium (Duke Engineering Services, COGEMA, Inc. and Stone

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[a] As a result of recent budget adjustments made by the Administration, this Budget reflects detailed program changes based on budget numbers not yet developed. Therefore, all outyear cost numbers are preliminary estimates. The program will be undergoing an intensive replanning effort based on these changes.

[b] The full amounts of the obligations are needed in order to place on contracts for construction services and plant equipment.

[c] Cost beyond FY2003 are projections and updated estimates will be provided in June 2004.

[d] The original appropriation amount of $ 92,687,000 was reduced by FY 2003 Recision amount of $599,000 to $92,088,000.

[e] The original appropriation amount of $402,000,000 was reduced by FY 2004 Recision amount of $2,372,000 to $399,628,000.

[f] A total of $11,405,000 is proposed to be reallocated to project 99-D-141, Pit Disassembly and Conversion Facility, Savannah River Site, Aiken, South Carolina, as part of a reprogramming action.

[g] The FY 2004 appropriated amount has not been adjusted for the FY 2004 Congressional Omnibus Appropriations Bill rescission amount of .59 percent.

& Webster (DCS) on March 22, 1999 for the design of a MOX FFF to be built at the DOE Savannah River Site (SRS) and licensed by the Nuclear Regulatory Commission.

The MOX FFF will produce completed MOX fuel assemblies for use in existing domestic, commercial nuclear power reactors. The MOX FFF will be designed to receive and process 3.5 MT per year of plutonium powder from the Pit Disassembly and Conversion Facility (PDCF) and other selected inventories of weapon-grade plutonium oxide available within the DOE complex and accommodate about two-years storage for the incoming plutonium powder. The MOX FFF is capable of expanding throughput to 4 MT per year to meet provisions in the Russian agreement. The facility's operating life is expected to be approximately 12 years.

Design of the MOX FFF is based on processes and facilities currently being successfully operated in Europe, specifically the MELOX and La Hague facilities in France. The MOX fuel fabrication design will replicate the automated MELOX equipment and facility design and will include lessons learned from operations and maintenance experiences. The MOX FFF will be designed and built to meet U.S. conventions, codes, standards, and regulatory requirements (Americanization process). After completing its mission, the facility will be deactivated, decontaminated, and decommissioned over a three- to four-year period.

The MOX FFF will require approximately 366,000 square feet to perform all material processing and fabrication operations to produce MOX fuel. Specific MOX FFF operations include the following: aqueous polishing (to purify plutonium before fabrication into fuel); blending and milling; pelletizing; sintering; grinding; fuel rod fabrication; fuel bundle assembly; storage of feed material, pellets, and fuel assemblies; a laboratory; and space for use by International Atomic Energy Agency (IAEA). The facility also requires 120,000 square feet of structures adjacent to the MOX process areas for secure shipping and receiving, material receipt, utilities, and technical support.

Cost and Schedule

The TEC for the MOX FFF is TBD due to FY 05 budget changes. These changes require a revision to the overall cost and schedule estimates for the MOX FFF. Cost and schedule estimates in this Data Sheet are preliminary. The revised cost and schedule will be completed by June 2004.

The overall process and facility design (also known as base design) is 75% complete as of September 1, 2003. Title I (preliminary) design began in mid FY 1999 and was completed in December 2000. Title II (detailed design) began in January 2001 and will be completed in 2004. The Title II design has taken longer than planned due to scope changes to accommodate impure plutonium previously destined for immobilization and delays dictated by the Russian program. In order to maintain project schedule and reflect industry experience, glove box and equipment design efforts were initiated in FY 2002.

FY 2004 and FY 2005 Description of Activities

The main FY 2004 activities include completing the base design of the MOX FFF and continuing the manufacturing design activities of the process equipment units. In the base design, the structural design will be completed to develop construction bid packages to support construction commencement in May 2005. The remaining design packages (mechanical, electrical, etc.) will also be completed in FY 2004 to support the construction schedule in FY 2005 and beyond. Construction planning will fully commence in FY 2004 with the finalizing of Construction Management Plans.

For FY 2005, the initial suite of construction work packages will be issued to support the schedule and site preparation activities and will include land clearing and grading, temporary road construction, and establishment of temporary construction services. Procurement of the MOX FFF structural subcontract will begin in 2nd quarter FY 2005 with award in the third quarter. Initial mobilization and material procurement will begin in FY 2005 with MOX FFF building excavation scheduled in early FY 2006.

The FY 2005 construction TEC activities will also cover finalization of manufacturing design and continuation of software design for process equipment. Initiation of long lead equipment procurement and equipment fabrication will commence.

4. Details of Cost Estimate [a]

	(dollars in thousands)	
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design Drawings and Specifications)	163,300	153,300
Contingencies (4.7% of TEC)	8,000	18,018
Total, Design Phase (TBD% of TEC)	171,300	171,318
Construction Phase		
Improvements to Land	TBD	N/A
Buildings	TBD	N/A
Other Structures	TBD	N/A
Utilities	TBD	N/A
Standard Equipment	TBD	N/A
FY03 Procurment Engineering and Site Preparation	TBD	53,993
FY04 Procurment Engineering and Site Preparation	TBD	74,000
FY03 Physical Construction and Long Lead Procurments	TBD	328,000
Removal less salvage	TBD	N/A
Inspection, design and project liaison, testing, checkout and and acceptance (0.0% of TEC)	TBD	N/A
Construction Management (0.0% of TEC)	TBD	N/A
Project Management (0.0x% of TEC)	TBD	N/A
Total, Construction Costs (72.7% of TEC)	0	455,993
Contingencies	TBD	N/A
Design Phase (0.0% of TEC)	TBD	N/A
Construction Phase (0.0x% of TEC)	TBD	N/A
Total, Contingencies (0.0% of TEC)	0	0
Total, Line Item Costs (TEC)	171,300	627,311

[a] Amounts and schedules to be finalized by June 2004.

5. Method of Performance

The procurement strategy for the MOX FFF includes a base contract and three subsequent phases. The first step was completed on March 22, 1999 when DOE awarded a base contract to DCS to provide MOX fuel fabrication and irradiation services. This base contract includes the design and licensing of the MOX FFF, fuel qualification activities, and reactor license modifications.

Sequential contract phases include general construction (Phase 1), plant operations (Phase 2), and facility deactivation (Phase 3). In FY 02, DOE modified its contracting strategy to segment Phase I into three options of work. Option 1A is the effort associated with procurement engineering, basic ordering agreements, and the related project management support functions that are not already included in the base contract. Option 1B is the effort associated with the construction of the MOX FFF, where construction is defined as all procurement, equipment fabrication, actual construction and construction management services for the MOX FFF, support structures and related infrastructure, installation checks and testing conducted as part of the turnover of the construction efforts to an operating or startup team; and project management functions associated with these efforts. Option 1C is the effort associated with start-up of the MOX FFF.

It is expected that an incentive contract with DCS will be the most appropriate and cost beneficial instrument for the construction work. Actual physical construction will be through fixed-price subcontracts to the extent practical, with a cost-type contract for construction management services. Under an umbrella prime contract that will be incentivized, the MOX FFF will be Government-owned and contractor-operated. It is expected that during the facility operating phase of the consortium contract, facility operating costs will be partially offset by the value of the MOX fuel, which will displace the low-enriched uranium (LEU) fuel that utility companies would have otherwise purchased.

6. Schedule of Project Funding [a]

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Design Cost						
Design	118,509	53,508	.			171,318
Total Design (Federal and Non-Federal)	118,509	53,508				171,318
Procurement Engineering and Site Preparation	0	28,514	100,000	49,000	TBD	TBD
Construction, procurement, and cold startup	0	0	0	331,000	TBD [b]	TBD
Total Agency Requirement (Design, Procurement Engineering, long lead Procurement, Physical Construction)	118,509	82,022	100,000	380,000	TBD	TBD
Other Project Costs (Licensing, Technical support, Cold startup)	0	0	0	0	TBD	TBD
Total Project Cost	TBD	TBD	TBD	TBD	TBD	TBD

7. Related Annual Funding Requirements

(Dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs	100,500 [c]	N/A

[a] As a result of recent budget adjustments made by the Administration. The program will be undergoing an intensive replanning effort to develop accurate cost projections for FY 2006 and the outyears.

[b] These figures are projections and will be determined when the performance baseline is established June 2004.

[c] Operating costs taken from FY2002 *Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River*(to be updated in the 2004 Report to Congress).

Off-Site Source Recovery Project

Funding Schedule by Activity

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Off-Site Source Recovery Project					
Domestic Sealed Sources..............................	2,172	1,961	5,600	+ 3,639	+ 185.6%

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
Off-Site Source Recovery Project.......	5,600	8,750	8,803	8,861	8,920	40,934

Description

The program recovers excess and unwanted sealed sources on a priority basis, determined by the U.S. Nuclear Regulatory Commission in consultation with the Department of Energy, to reduce and ultimately eliminate the risk these sources pose to homeland security by their possible use in a radiological dispersal device. The Off Site Source Recovery (OSRP) reduces this risk by removing excess and unwanted sources from non-Department of Energy sites and placing these sources in storage at Department of Energy facilities.

Benefits to Program Goal 02.62.00.00 Off-Site Source Recovery

The Off-Site Source Recovery program contributes to achieving Program Goal 02.62.00.00 by (1) recovering Greater-Than-Class-C (GTCC) sealed sources from the Nuclear Regulatory Commission licensees and storing those sources pending disposal; (2) recovering Department of Energy - owned sources which are in the possession of domestic U.S. licensees through loan-lease or other mechanisms where there is no longer a mechanism for the return and acceptance of these sources by the program that originally provided the sources; and (3) accepting and storing pending disposition Department of Energy sealed sources which are of the same types being recovered from non-Department of Energy licensees. This activity occurs on a much smaller scale than commercial recovery operations.

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Cumulative number of excess and unwanted sealed sources recovered.	Recovered approximately 7,000 sealed sources	Recover approximately 8,500 sealed sources	Recover approximately 10,000 sealed sources	Recover approximately 12,200 sealed sources	Recover approximately 14,400 sealed sources	Recover approximately 16,600 sealed sources	Recover approximately 18,800 sealed sources	Recover approximately 21,000 sealed sources by 2010.
Cumulative number of Department of Energy – owned loan-lease plutonium-239 beryllium sources recovered.	Developing storage infrastructure for high attractiveness level sources.	Recover 250 DOE-owned Pu-239 sources. Begin disposal at WIPP.	Recover 400 DOE-owned plutonium 239 sources. Continue disposal at WIPP.					Total number by 2010
Annual ratio of sources recovered in a year over the number of known excess sources at the beginning of that year Risk Reduction Efficiency Factor (RREF). The goal is to recover more sources in a year than were known at the beginning, for an RREF > 1 (EFFICIENCY MEASURE)	RREF=0.67	RREF=0.8	RREF=0.9	RREF=1	RREF=1.1	RREF=1.2	RREF=1.3	2010, RREF=1.4

Detailed Program Justification

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Off-Site Source Recovery Project	**2,172**	**1,961**	**5,600**

The (OSRP) recovers and stores excess and unwanted sealed sources to reduce the threat of such sources being used in radiological dispersal devices. The (OSRP) and the Department of Energy have worked closely to assist the U.S. Nuclear Regulatory Commission (NRC) to develop a source recovery prioritization. Sources that can be classified as defense waste are disposed of at the Waste Isolation Pilot Plant (WIPP). The scope of the OSRP is primarily domestic U.S. sources in the possession of licensees, where such sources exceed the limits for commercial disposal. Sources that exceed the limits for commercial disposal are considered Greater Than Class C (GTCC) and are a Department of Energy responsibility for disposal under Public Law 99-240.

The Office of Environmental Management (EM) and the National Nuclear Security Administration (NNSA) have agreed to transfer management responsibility for the (OSRP) from EM to NNSA. The responsibilities of the OSRP that are to be transferred to NNSA include the removal and storage of excess radioactive sealed sources. These activities are consistent with the mission of NNSA to enhance nuclear security.

OSRP shall continue, under NNSA, to recover (GTCC) sealed sources from the NRC licensees and store those sources pending disposal. NNSA will have program responsibility for recovery and interim storage of these sources. The Office of Environment, Safety and Health (EH) and the Office of Civilian Radioactive Waste Management (RW) have the responsibility to make a Department of Energy decision on GTCC waste disposition.

The program recovers excess and unwanted sources possessed by state and (NRC) licensees. The licensees determine when such sources are excess to their needs and are therefore unwanted. The OSRP is informed by licensees registering their sources with OSRP that the sources are excess and unwanted and need to be recovered. The number and type of sources that will become excess and unwanted in the future cannot be known or predicted with any great degree of accuracy. The location of sources needing recovery, the ability of the licensee to participate and assist in the recovery process, and the conditions under which sources must be recovered all vary with each recovery.

The OSRP also recovers Department of Energy - owned sources in the possession of domestic U.S. licensees through loan-lease or other mechanisms where there is no longer a mechanism for the return and acceptance of these sources by the program that originally provided the sources. The OSRP also provides a very limited internal service to Department of Energy sites by accepting and storing Department of Energy sealed sources that are of the same types being recovered from non-Department of Energy licensees.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Recovery - The majority of the cost of the OSRP falls under recovery operations. This includes staff time, collecting information on sources, planning recovery, procuring specially shielded drums, and the actual travel to the recovery location, packaging, and transportation of the sources. Recovery operations take place at the Los Alamos National Laboratory (LANL), including the registration of licensees having excess and unwanted GTCC sources and the scheduling of the recovery of those sources. In FY 2005 an estimated 1,500 sources will be recovered.

Sources will be recovered in a variety of ways. Licensees with only a few sources may self-ship their sources to the OSRP or to a designated consolidation point, where they are combined with other recovered sources, packaged optimally, and placed in storage at LANL. Licensees unable to self-ship will be identified, and the OSRP will go to a number of such sites in a geographic area to packages and ship those sources to LANL or a consolidation point. Finally, for licensees with enough sources to fill one or more drums, LANL will send a team to package the sources and perform all applicable security and quality control checks, allowing these full drums to go directly to storage at LANL with no further processing or need to reopen the packaging, saving significant cost and worker exposure. The OSRP procures specially shielded drums and other field equipment necessary to recover sources in a variety of conditions at licensee's facilities.

Storage and Disposal - The OSRP stores sources at LANL with security commensurate with the isotope type. Defense-origin actinides are sent from LANL to WIPP for disposal. Currently, all the identified plutonium-239 sources requiring recovery are owned by the Department of Energy and have been formally determined to be defense waste. All such sources will be recovered, placed into interim storage, and disposed of at WIPP. Department of Energy –owned defense americium-241 and plutonium-238 sources can also be disposed of at WIPP. Sources which are owned by licensees, or come from non-defense Department of Energy facilities cannot be disposed of at this time. When the Department makes the necessary determinations for the disposal of GTCC waste, which is beyond the scope of the OSRP program, those sources will be disposed of in accordance with that determination.

In FY 2005, the OSRP will be beginning the recovery of cesium-137 and strontium-90 sources in addition to these other activities. For cesium-137 and strontium-90, there are very few such sources relative to transuranic sources, but each source is of very high activity.

Once the Department of Energy determines and implements a mechanism for GTCC waste disposal, and in particular for GTCC sealed sources, the OSRP will be phased out and replaced by a mechanism that allows possessors of GTCC sources to interface with the disposal site and provide for a more direct disposal of GTCC sources. The responsibility to conduct an appropriate review and analysis under the National Environmental Policy Act for the disposal of GTCC waste has been assigned to the Department's Office of Environment, Safety, and Health.

Total, Off-Site Source Recovery Project......................	**2,172**	**1,961**	**5,600**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Off-Site Source Recovery Project**	
Increase is due to the needed acceleration of this program's recovery of these excess and unwanted sources and to eliminate the risk that these sources pose to homeland security	+ 3,639
Total Funding Change, Off-Site Source Recovery Project	**+ 3,639**

Naval Reactors

Naval Reactors

Naval Reactors

Proposed Appropriation Language

For Department of Energy expenses necessary for naval reactors activities to carry out the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition (by purchase, condemnation, construction, or otherwise) of real property, plant, and capital equipment, facilities, and facility expansion, and [the purchase of not to exceed one bus, $766,400,000] $797,900,000, to remain available until expended.

Explanation of Change

Changes from the language proposed in FY 2004 consist of a change to the number of proposed motor vehicles and funding amounts.

Naval Reactors

Funding Profile by Subprogram

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Original Appropriation	FY 2004 Adjustments	FY 2004 Comparable Appropriation	FY 2005 Request
Naval Reactors Development (NRD)					
Operations and Maintenance	666,927	723,100	- 4,264	718,836	761,211
Program Direction	24,043	26,700	- 148	26,552	29,500
Construction	11,226	18,600	- 110	18,490	7,189
Subtotal, Naval Reactors Development	702,196	768,400	- 4,522	763,878	797,900
Less Use of prior year balances	0	- 2,000		- 2,000	0
Subtotal Adjustments	0	0	0	0	0
Total, Naval Reactors	702,196	766,400	- 4,522	761,878	797,900

FYNSP Schedule

(dollars in thousands)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FYNSP Total
Naval Reactors	797,900	803,000	818,000	834,000	850,000	4,102,900

Public Law Authorization:

Pub. L. 83-703, “Atomic Energy Act of 1954”

"Executive Order 12344 (42 U.S.C. 7158), “Naval Nuclear Propulsion Program”

Pub. L. 107-107, “National Defense Authorization Act of 2002”, Title 32, “National Nuclear Security Administration”

FY 2003 Execution

(dollars in thousands)

	FY 2003 Approp	General Reduction	Rescission	Supplement	Reprogram-ming	Comp Adjustment	Current FY 2003 Comparable
Naval Reactors							
NR O&M	671,290	0	- 4,363	0	0	0	666,927
Construction	11,300	0	- 74	0	0	0	11,226
NR Program Direction	24,200	0	- 157	0	0	0	24,043
Total, Naval Reactors	706,790	0	- 4,594	0	0	0	702,196

FY 2004 Appropriation

(dollars in thousands)

	FY 2004 Enacted Approp	Use of Prior Year Balance	Pending Rescis-sion	Supple-mental	Reprogram-ming/Trans-fers	Comp Adjustments	Current FY 2004 Comp
Naval Reactors O&M ...	723,100	0	-4264	0	0	0	718,836
Construction	18,600	0	-110	0	0	0	18,490
NR Program Direction ..	26,700	0	-148	0	0	0	26,552
Subtotal, Naval Reactors	768,400	0	-4,522	0	0	0	763,878
Use of prior year balances	-2,000	0	0	0	0	0	-2,000
Total, Naval Reactors...	766,400	0	-4,522	0	0	0	761,878

Description

Mission

Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operation.

Benefits

As the post-Cold War era evolves, the NNSA is working to provide the U.S. Navy with nuclear propulsion plants that are capable of responding to the challenges of the 21st century security environment.

Program Goal: The Naval Reactors program has one program goal which contributes to General Goal 3 in the "goal cascade":

General Goal 3, Naval Reactors: Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operation.

Contribution to General Goal 03

Within the Naval Reactors program, the Plant Technology, Reactor Technology and Analysis, Materials Development and Verification, Evaluation and Servicing, Facility Operations, Construction, and Program Direction subprograms each make unique contributions to Program Goal 03.49.00.00.

Naval Reactors is responsible for all naval nuclear propulsion work, beginning with technology development, continuing through reactor operation and, ultimately, reactor plant disposal. The Program ensures the safe operation of reactor plants in operating nuclear-powered submarines and aircraft carriers (constituting 40 percent of the Navy's combatants), and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements.

Naval Reactors is principally a technology program in the business of power generation for military application. The Program's development work ensures that nuclear propulsion technology provides options for maintaining and upgrading current capabilities, as well as for meeting future threats to U.S. security. As advances in various functional disciplines coalesce, work is integrated into the technology applicable to a naval nuclear plant. The presence of radiation dictates a careful, measured approach to developing and verifying nuclear technology, designing needed components, systems, and processes, and implementing them into existing and future plant designs. Intricate engineering challenges and long lead times to fabricate the massive, complex components require many years of effort before technological advances can be introduced into the Fleet.

The Program's number-one priority is ensuring the safety and reliability of the 103 operating naval reactor plants. Most of the work within the Naval Reactors Program is directed toward ensuring the safe, reliable operation of these plants. Naval Reactors is continuing development of a high energy reactor for CVN 21 and design of the new Transformational Technology Core (TTC), which will provide a significant energy increase to VIRGINIA-class ships.

Nuclear power enhances warship capability and creates the flexibility needed to sprint anywhere in the world and arrive ready for around-the-clock power projection and combat operations. Sustained high-speed capability (without dependence on a slow logistics train) enables rapid response to changing world circumstances, allowing operational commanders to surge these ships from the United States to trouble spots or to rapidly redeploy them from one crisis area to another. Nuclear propulsion helps the Navy stretch available assets to meet today's worldwide national security commitments.

The nuclear propulsion plant design of CVN 21 is well underway. The new high energy reactor design for CVN 21 represents a critical leap in capability; not only will the CVN 21 reactor enable the Navy to meet current forecasted operational requirements, but just as importantly, it will provide flexibility to deal with unanticipated warfighting needs in the future. The CVN 21 reactor will provide greater than 25 percent more energy than the reactors in NIMITZ-class ships. This propulsion plant will have substantially more electrical generating capacity than NIMITZ-class ships, but will require just half the number of sailors to operate and will be easier to maintain. The extra energy will support higher operational tempos or longer reactor life in the CVN 21-class.

The CVN 21-class lead ship is expected to be authorized in 2007 and to go to sea in 2014.

To meet ever increasing national security demands, Naval Reactors is working on TTC to deliver a significant energy increase to future VIRGINIA-class ships with minimum impact to the overall ship design. TTC is a direct outgrowth of the Program's advanced reactor technology work and will not only help meet national security demands, but will also act as a stepping stone for future reactor plant development.

Long-term Program goals have been to increase core energy, to achieve life-of-the-ship cores, and to eliminate the need to refuel nuclear powered ships. Although efforts associated with this objective have resulted in planned core lives that were sufficient for the 30-plus year submarine (based on past usage rates) and an extended core life planned for CVN 21, fleet size is down and national security demands require a higher operating tempo and greater speed during deployments. Since September 11, 2001, submarine operating requirements have increased by 30 percent. Continuing this pace will reduce the expected core life to less than 30 years.

TTC will offset the increasing national security demands by using advanced reactor core materials to achieve a significant increase to the core energy density—more energy without increasing size, weight or space while still at a reasonable cost. With significantly more energy, the objective for TTC is to do one or more of the following: extend ship life by as much as 30 percent; increase operating hours per operating year; or allow operation at a higher average power during ship operations. The end result is significantly greater operational ability and flexibility.

The timing of TTC development also corresponds with the need to transition from 97 to 93 percent enriched Uranium fuel. This transition is necessitated by the shutdown of the high enrichment plant and the decision to use Uranium recovered from retired nuclear weapons as starter material for naval nuclear reactors.

TTC is intended for forward-fitting into VIRGINIA-class submarines, which is planned to be the mainstay of the submarine fleet in future decades. TTC development should support procurement of a prototypic core in about FY 2008. In FY 2005, Naval Reactors will complete TTC core conceptual design and initiate final design and development work.

Annual Performance Results and Targets

FY 2000 Results	FY 2001 Results	FY 2002 Results	FY 2003 Results
Ensure the safety, performance reliability, and service-life of operating reactors. (MET GOAL).	Ensure the safety, performance, reliability, and service-life of operating reactors for uninterrupted support of fleet demands, including maintaining utilization factors of at least 90 percent for test reactor plants, and 121 million miles steamed for nuclear-powered ships. (MET GOAL)	Naval Reactors safely steamed over two million miles in nuclear–powered ships. (MET GOAL) Naval Reactors exceeded a 90% utilization factor for operation of test reactor plants. (MET GOAL)	Completed safe steaming of approximately two million miles in nuclear-powered ships. (MET GOAL) Achieved a utilization factor of at least 90% for operation of test reactor plants. (MET GOAL)
Develop new reactor plants, including the next generation reactor, the design of which will be 90 percent complete by the end of FY 2000, and complete initial development efforts on a reactor plant for the next generation aircraft carrier. (MET GOAL)	Develop new technologies, methods and materials to support reactor plant design, including the next generation submarine reactor, which will be 93 percent complete by the end of FY 2001 and initiate detailed design efforts on a reactor plant for the next generation aircraft carrier. (MET GOAL)	Next-generation submarine reactor design 96% complete. (MET GOAL) Next-generation aircraft carrier reactor design 40% complete. (MET GOAL)	Next-generation submarine reactor design 99% complete. (MET GOAL) Next-generation aircraft carrier reactor plant design 55% complete. (MET GOAL)
Ensure radiation exposures to workers or the public from Naval Reactors' activities is within Federal limits and no significant findings result from environmental inspections by State and Federal regulators. (MET GOAL)	Maintain outstanding environmental performance by ensuring that no personnel exceed Federal limits for radiation exposure, and no significant findings result from environmental inspections by State and Federal regulators. (MET GOAL)	No personnel exceeded 5 REM/year. (MET GOAL) Operations had no adverse impact on human health or the quality of the environment. (MET GOAL)	No personnel exceeded 5 REM/year. (MET GOAL) Operations had no adverse impact on human health or the quality of the environment. (MET GOAL)

Annual Performance Results and Targets

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Miles of safe reactor plant operation supporting National security requirements.	Completed safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately two million miles in nuclear-powered ships.	Complete safe steaming of approximately 130 million miles in nuclear-powered ships in FY 2005.
Utilization factor for operation of test reactor plants. (EFFICIENCY MEASURE)	Achieved a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	N/A
Percent of completion on the Transformational Technology Core (TTC) reactor plant design.		Establish design basis from preliminary studies and development to enable the start of conceptual design.	Complete TTC core conceptual design and initiate final design and development work.	Complete 50% of TTC design work to support core contract placement. Establish steam generator design configuration to support TTC core performance improvements.	Complete all TTC design and development necessary to place core fabrication contract in FY08.	Release fabrication of fuel and poison elements for the TTC core.	Initiate core production and perform higher-tier qualification work.	The TTC development will support procurement of a prototypic core in FY08 and deliver the first TTC core in 2014.
Percent of completion on the next-generation aircraft carrier reactor plant design.	Next-generation aircraft carrier reactor design 55% complete.	Next-generation aircraft carrier reactor design 60% complete.	Next-generation aircraft carrier reactor design 70% complete.	Next-generation aircraft carrier reactor design 75% complete.	Next-generation aircraft carrier reactor design 80% complete.	Next-generation aircraft carrier reactor design 85% complete.	Next-generation aircraft carrier reactor design 90% complete.	The next-generation aircraft carrier will go to sea in 2014.
Percent of completion on the next-generation submarine reactor plant design.	Next-generation submarine reactor 99% complete.	Complete 100% of the next-generation submarine reactor design.						The next-generation submarine will go to sea in 2004.

Performance Indicators	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Endpoint Target Date
Ensure no one exceeds Federal limits for personnel radiation exposure from Program operations.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	No personnel exceed 5 rem/year.	N/A
Ensure Program operations have no adverse impact on human health or the quality of the environment.	Operations had no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	Operations have no adverse impact on human health or the quality of the environment.	N/A

Means and Strategies

The Naval Rectors program will use various means and strategies to achieve its program goals. However, various external factors may impact the ability to achieve these goals. The program also performs collaborative activities to help meet its goals.

The Department uses two Government-owned, contractor-operated laboratories, the Bettis and Knolls Atomic Power Laboratories, which are solely dedicated to naval nuclear propulsion work. Through these laboratories and testing conducted at the Advanced Test Reactor (ATR) located at the Idaho National Engineering and Environmental Laboratory (INEEL), the Department will complete scheduled design, analysis and testing of reactor plant components and systems, and will conduct planned development, testing, examination, and evaluation of nuclear fuel systems, materials, and manufacturing and inspection methods necessary to ensure the continued safety and reliability of reactor plants in Navy warships. The Department will also accomplish planned testing, maintenance and servicing at land-based prototype nuclear propulsion plants, and will execute planned inactivation of shutdown, land-based reactor plants in support of environmental cleanup goals. Finally, the Department will carry out the radiological, environmental and safety monitoring and ongoing cleanup of facilities necessary to protect people, minimize release of hazardous effluents to the environment, and comply with all applicable regulations.

Industry-specific business conditions, outside technological developments and Department of Navy decisions all impact the performance of naval nuclear propulsion work.

Naval nuclear propulsion work is an integrated effort involving the DOE and the Navy, who are full partners in the Naval Nuclear Propulsion Program. This relationship is set forth in the Executive Order 12344 and Title 42 U.S.C. 7158.

Validation and Verification

NNSA uses extensive internal and external reviews to evaluate progress against established plans. NR plans semi-annual reviews of performance measure execution in addition to monthly financial and technical work reviews with the M&O contractors. NNSA's programmatic activities are subject to continuing review by the Congress, the General Accounting Office, the Department's Inspector General, the National Security Council, the Defense Nuclear Facilities Safety Board, the Department's Office of Engineering and Construction Management, and the Department's Office of Independent Oversight and Performance Assurance.

Funding by General and Program Goal

(Dollars in Thousands)

	FY 2003 Approp	FY 2004 Approp	FY 2005 Request	FY 2006	FY 2007	FY 2008	FY 2009
General Goal 3: NAVAL REACTORS	702,196	761,878	797,900	803,000	818,000	834,000	850,000
Program Goal 3-49-00-00	702,196	761,878	797,900	803,000	818,000	834,000	850,000

NR Strategies

The following six strategies support Naval Reactors' program goal and are integrated into the detailed program justifications within the budget. Thus, within each component of the Detailed Program Justification, Naval Reactors identifies the relevant strategies from the following list, the principal activity areas which exist within each strategy (summarized below), and verifiable supporting activities for each area.

1. **Conduct planned development, testing, examination and evaluation of nuclear fuel systems, materials, and manufacturing and inspection methods to ensure naval nuclear reactors are able to meet Navy goals for extended warship operation.**

As national security demands increase with a smaller submarine fleet, each ship must carry more of the burden, be on line more of the time, and stay in service longer. Examples of the increasing demands can be seen in the operating tempo required to support military requirements worldwide to protect our country from serious threats from hostile nations and organizations without fixed borders.

To support these operational demands, materials, components, and systems must be operationally reliable for longer periods than ever before. For example, plants originally designed for a twenty-year service life are now being called upon to serve up to about fifty years. Exhaustive testing, analysis, performance enhancements, and development efforts are needed so that component and system endurance—despite mechanical strain and wear, and potential corrosion due to stress and irradiation—can be ensured throughout an extended lifetime. Additionally, to meet the ever-increasing national security demands, Naval Reactors has begun preliminary design studies on the Transformational Technology Core (TTC). TTC is a direct outgrowth of the Program's advanced reactor technology work and will not only help meet national security demands, but will also act as a stepping stone for future reactor plant development.

Development efforts to date have yielded significant advantages. Enhanced component reliability and improved predictive techniques have allowed the Navy to extend the intervals between major maintenance periods, increasing ship on-line time and, thus, the Navy's war fighting capability, while reducing cost. However, these advancements also generate new challenges. For example, the longer intervals between maintenance periods reduce opportunities to examine and/or replace aging components and systems. Thus, more extensive analysis and testing are required to verify materials and component performance. In a similar vein, development of a life-of-the-ship core offers major advantages in terms of ship availability, as well as reducing cost, radiation exposure and waste generation; but a life-of-the-ship core also reduces mid-life opportunities to examine components and help ensure integrity. Testing and verification, therefore, are of paramount importance.

These efforts are especially challenging given the demanding nature of nuclear propulsion technology. Components and materials must perform reliably within the harsh environment of a reactor plant. Comprehensive and rigorous analyses are needed to ensure the ability to withstand the deleterious effects of wear, corrosion, high temperature, and pressure over a lifetime measured in decades. In addition, naval reactor plants must be rugged enough to accommodate ships' pitching and rolling; have the resilience to respond to rapidly-changing demands for power; be robust enough to withstand the rigors of battle; and be safe and easily maintainable for the sailors who live next to them.

The following are principal activity areas for this strategy:

- Improve nuclear heat source (core) design and analysis methods and develop improved designs to satisfy service life requirements.
- Evaluate and test improved core manufacturing processes and inspection techniques to support extended life reactors.
- Examine fuel cells removed at the end-of-life, and perform non-destructive examinations of irradiated test specimens to confirm predicted performance and validate design methods.
- Develop improved nuclear fuel, core and reactor structural materials which extend core lifetimes up to the life of the ship, and evaluate irradiation tests of new and existing materials to verify acceptable lifetime performance and to improve predictive capabilities.
- Test and evaluate plant materials to characterize the long-term effects of the harsh operating environment, and qualify improved materials and processes to ensure endurance requirements will be met.
- Conduct irradiation testing and perform detailed examinations to provide data for material performance characterization and prediction.

2. Complete scheduled design, analysis, and testing of reactor plant components, systems, and performance to ensure the operational safety and reliability of reactor plants for use in Navy nuclear powered warships so they can fulfill their national defense mission.

Naval Reactors is responsible for the operation of 103 reactors—equal to the number of commercially operated nuclear power plants in the United States.

Naval nuclear power plants operate over lifetimes of up to five decades. Challenges to the reliability and integrity of the plants change and grow over this long life. Continuous monitoring and analyses are thus vital to ensure continued safe and reliable performance. Also, new knowledge gained during the years of operation must be assessed against the operating plants.

Since nuclear powered warships account for such a large portion of the Navy's combatant fleet, the successful operation of their reactor plants is a key factor in the Navy's ability to perform its national defense role. The safety record of the Naval Nuclear Propulsion Program is outstanding: nuclear-powered warships have steamed more than 128 million miles without a reactor accident or a significant release of radioactivity to the environment. The continued ability of the Navy to benefit from nuclear propulsion is dependent on continuance of this record.

The following are principal activity areas for this strategy:

- Design and test improved reactor equipment including advanced control rod drive mechanisms, which eliminate gears and provide rod speed flexibility.

- Perform physics testing and analysis to confirm expected fuel system and core performance; develop improved analysis methods for predicting core performance that reduce design approximations, uncertainties, and associated conservatism.

- Conduct reactor safety and shielding analyses to ensure containment of radiation and proper protection of personnel.

- Ensure satisfactory reactor plant operation throughout life, and improve steam generator, energy conversion and steam generator chemistry technologies to enhance performance and reduce maintenance costs.

- Develop instrumentation and control equipment to replace obsolete equipment and improve reliability and performance and reduce cost.

- Develop and test reactor plant components and applicable technologies, which address known limitations and improve performance and reliability of components.

- Perform reactor plant analyses to assure safe operation and improve reactor plant chemistry controls to reduce corrosion and plant radiation levels.

3. Accomplish planned core and reactor component/system design and technology development efforts to support the Navy's acoustic requirements.

One of the greatest advantages provided by submarines is stealth. Stealth—invisibility—allows submarines to operate undetected, conducting surveillance or performing offensive missions with minimal concern for defensive needs, providing, in effect, a tremendous force multiplier. This capability must be maintained in the face of ever improving means of detection. In order to do so, Naval Reactors must ensure the reactor components and systems used in submarines meet tightening Navy operating parameters for quieting.

Achieving stringent performance goals requires highly instrumented testing of components and the development of sophisticated analysis techniques to predict and measure hydrodynamics, structural dynamics, motor acoustics, fluid solid interactions, and sound transmission. These models are improving and being used in conjunction with testing of components. Advanced computational fluid dynamics models are being developed and will be used to improve the acoustic performance of future components.

The principal activity for this strategy is to develop and qualify improved core and reactor component thermal and hydraulic designs.

4. Maintain a utilization factor of at least 90 percent for operation of test reactor plants to ensure availability for planned tests of cores, components, systems, materials, operating procedures, and for scheduled training, and provide for development of servicing equipment to help ensure reactor safety and reliability.

Naval Reactors has two operating land-based prototype naval nuclear propulsion plants at the Kesselring site in New York, and also is the principal customer of the Advanced Test Reactor (ATR) located at the Idaho National Engineering and Environmental Laboratory.

The prototype plants are an essential component in meeting Naval Reactors' mission of ensuring the safe and reliable operation of naval reactor plants. Prototypes provide platforms for testing under actual operating conditions, which cannot be duplicated in the laboratory. This testing yields important technical data and experience, and allows potential problems to be identified and addressed before they occur in shipboard operating reactor plants. The prototypes are used to test new components and to verify reactor performance predictions by depleting the core faster than would be done in an operating shipboard plant. For example, the advanced fleet reactor, now used in the SEAWOLF class attack submarine, has achieved the equivalent of 26 years of shipboard operation in the S8G prototype plant. As a side benefit to the DOE, the prototypes are also used to train Navy nuclear plant operators. Training and qualification of nuclear operators remains a key part of the Program's direct support of the operating Fleet; over 110,000 Navy nuclear power plant operators have been qualified in the Program's rigorous training program. Utilization factor is a measure of prototype availability for planned testing, training, or maintenance. To maintain a high utilization factor, Naval Reactors must be forward thinking in identifying potential problems before they occur.

Operation of the ATR provides a unique capability to irradiate test specimens, which are then examined to provide data on the effects of radiation on materials. The ATR's arrangement permits varying conditions within the reactor test loops allowing accelerated life testing of materials, a major benefit.

At the end of core life, a servicing activity must remove the spent core from a reactor plant. This is an extremely critical operation given the radioactivity of spent fuel. If the reactor plant is to remain in service, a new core must be installed. Fuel handling equipment used in this operation is designed to operate safely under all possible normal and abnormal conditions, and thorough evaluations are conducted during the design and fabrication processes. Engineering models are tested to demonstrate proper operation and detailed procedures are prepared to cover use of the equipment.

The following are principal activity areas for this strategy:

- Operate the prototype plants to provide component and core depletion data and verification, plant integration experience, and to train reactor plant operators.

- Service land-based test reactor plants to ensure continued safe and efficient operation, and develop equipment and procedures to provide for safe and efficient servicing of nuclear reactor plants.

- Provide support funding to the ATR to provide for material irradiation testing.

5. **Safely and responsibly inactivate shutdown land-based reactor plants in support of Program and Departmental environmental cleanup goals.**

Naval Reactors has shut down six prototype reactor plants no longer required for testing or training. With the Windsor, Connecticut facility removed and land-transfer nearly complete, the three prototypes at NRF in an environmentally benign lay-up condition, and inactivation work continuing on the Kesselring Site prototypes, major prototype inactivation work is nearly finished.
The public expects and deserves prompt inactivation and remediation of shutdown reactor prototypes. Prompt dismantlement is also consistent with the Department's environmental clean-up goals, and is the most efficient and cost effective approach to this work.

The following are principal activity areas for this strategy:

- Continue efforts at the Windsor site in Connecticut to release applicable areas for unrestricted use.

- Continue inactivation and remediation efforts at the Kesselring Site in New York to eliminate surplus facilities, remediate and dismantle plant facilities and release applicable areas.

- Continue inactivation and remediation efforts at the Naval Reactors Facility in Idaho to eliminate surplus facilities, remediate and dismantle plant facilities and release applicable areas.

6. **Maintain outstanding environmental performance through radiological, environmental and safety monitoring, and continue cleanup of Program facilities.**

Naval Reactors continues to have an outstanding environmental performance record, despite today's stricter government regulations. Naval Reactors cleans up after itself in a rigorous, environmentally safe, and correct manner—including properly maintaining our facilities. The Program has established environmental compliance programs to meet all applicable regulations directed toward environmental excellence. This includes areas such as remediation of historical facilities, emphasis on recycling and waste minimization, strict standards for air and water emissions and monitoring programs to validate that Program activities have no adverse effect on the environment.

When properly and diligently dealt with, nuclear propulsion is a safe, efficient power source, and is environmentally less damaging than other sources. With regard to radiation, Naval Reactors has an aggressive program to minimize personnel exposure to as low as reasonably achievable such that since 1980 no Program personnel have received more than two REM in any one year.

The following are principal activity areas for this strategy:

- Conduct radiological control, environmental, and safety operations necessary to protect laboratory employees, minimize release of hazardous effluents to the environment, and comply with all applicable regulations.

- Conduct ongoing clean up of test facilities to reduce hazards to personnel, and reduce potential liabilities due to changing conditions or accidental releases.

- Conduct decontamination and decommissioning necessary to minimize the potential for future environmental chemical or radiological releases, minimize the costs of maintaining idle facilities, and free up central areas at various sites for future Program use.

Performance Measure Funding Matrix
FY 2005
Budget Categories
(dollars in thousands)

Performance Measures	Reactor Technology & Analysis	Plant Technology	Materials Development & Verification	Evaluation & Servicing
Meet Navy goals for extended warship operation, through:				
Nuclear heat source design and analysis methods	69,000			
Core manufacturing processes and inspection techniques	34,600			
Removed fuel cell and irradiated test specimen examination				48,090
Fuel, core and reactor structural material development & testing			52,800	
Plant materials development and testing			34,700	
Irradiations testing and examination			63,300	
Ensure safety and reliability of reactor plants, through:				
Reactor equipment design & testing	35,100			
Physics testing and analysis	21,000			
Safety and shielding analyses	13,700			
Steam generator, energy conversion, and chemistry technologies improvements		43,900		
Instrumentation and control equipment development		63,800		
Reactor plant components development & testing		38,100		
Reactor plant performance analyses and chemistry control		9,700		
Support Navy's acoustic requirements, through:				
Core and reactor component thermal and hydraulic design	16,000			
Ensure prototype plant availability, through:				
Operation of land-based test reactor plants				42,000
Servicing of land-based test reactor plants				16,400
Operation and servicing of the advanced test reactor				18,000
Inactivate shutdown prototype plants, through:				
Inactivation efforts in Connecticut				
Inactivation efforts in New York				15,200
Inactivation efforts in Idaho				400

	Reactor Technology & Analysis	Plant Technology	Materials Development & Verification	Evaluation & Servicing
Maintain outstanding environmental performance, through:				
Radiological, environmental and safety operations	42,700			
Cleanup of test facilities				31,910

Annually, the Office of Procurement and Assistance Management advises each of the Departmental elements of the annual assessment required to pay for the Defense Contract Audit Agency (DCAA) activities performed for the Department. The amount for Naval Reactors is $696,900 in FY 2004 and $730,400 in FY 2005.

Funding Schedule by Activity

(dollars in thousands)

Naval Reactors Development	FY 2003	FY 2004	FY 2005	$ Change	% Change
Plant Technology	108,897	130,625	155,500	+ 24,875	+ 19.0%
Reactor Technology & Analysis..	228,600	233,615	232,100	- 1,515	- 0.6%
Materials Development & Verification	135,969	136,888	150,800	+ 13,912	+ 10.2%
Evaluation and Servicing	151,975	169,693	172,000	+ 2,307	+ 1.4%
Facility Operations	41,486	48,015	50,811	+ 2,796	+ 5.8%
Total, Naval Reactors Development O&M	666,927	718,836	761,211	+ 42,375	+ 5.9%

Detailed Justification

Plant Technology

	(dollars in thousands)	
FY 2003	FY 2004	FY 2005

Mission Supporting Goals/Objectives:

Plant Technology focuses on developing, testing and analyzing components and systems which transfer, convert, store and measure power created by the nuclear reactor in a ship's power plant. Reactor plant performance, reliability, and safety are maintained via a thorough understanding of component performance and system condition throughout the life of a ship. Also, new components and systems are needed to support new reactor plants and to replace obsolete or degraded equipment and systems. Development and application of new analytical methods, predictive tests, and design tools are required to identify potential concerns before they become actual problems. This enables preemptive actions to ensure continued safe operation of reactor plants. Advances in modeling, analysis, and water chemistry are already permitting the safe operation of components beyond their original design life. Continued progress in various technologies such as manufacturing/welding processes, fluid dynamics, predictive models/analysis and thermal-hydraulics are enhancing operating plant performance and allowing major improvements in performance for new reactor plants. For example, the reactor plant systems and components now under development for the VIRGINIA- and CVN 21-class will be more dependable, improve operating efficiency, and reduce life cycle costs.

Reactor plants require constant monitoring and analysis due to exposure to extreme temperatures and pressures. Steam generators are especially susceptible to corrosion due to the intense boiling environment required to convert reactor heat to steam. Naval Reactors is pursuing technologies to greatly reduce corrosion through fundamental design changes in components and water chemistry.

Wear and tear on operating reactor machinery, such as pumps with constantly rotating parts, limit system and component life and can require extensive and costly maintenance. Plant Technology provides funding for programs to combat wear and tear through the implementation of better materials and lubricants, as well as more resilient designs, creating longer-lived and more reliable components and systems with reduced maintenance requirements. In addition, these programs provide for the comprehensive testing and review required to ensure improvements for one area of the plant do not cause unanticipated problems in another area of the plant.

Extensive development work is devoted to applying advances in electronics to instrumentation and control equipment and systems. Due to the harsh and intense operating environment and rapid obsolescence of electronic equipment, this equipment must be replaced during the lifetime of an operating plant. While this presents a continuing challenge, rapid technical advances are providing distinct advantages. For example, improved accuracy and reliability of the new design instrumentation extend the long-term useable power obtained from the reactor. Also, developing human-machine interface and data collection schemes allow for a less expensive incorporation of new display technologies while presenting data to the operator in a more effective manner.

Plant Technology	FY 2003	FY 2004	FY 2005

(dollars in thousands)

I. Complete scheduled design, analysis, and testing of reactor plant components, systems, and performance to ensure the operational safety and reliability of reactor plants for use in Naval nuclear powered warships so they can fulfill their national defense mission.

A. Improve nuclear reactor core design and analysis methods and develop improved designs to satisfy service life requirements.......	**20,497**	**31,800**	**43,900**

Steam generators provide energy to the main turbines by converting heat from the reactor plant into a usable medium — steam. To accomplish this, extremely hot pressurized water from the reactor primary system flows through multiple thin-walled tubes necessary to efficiently transfer the reactor heat in the heat exchanger within the steam generator. A shell containing secondary water surrounds these tubes. The secondary water is at a lower pressure and boils into steam. Consequently, integrity of steam generator pressure boundary parts and tubing is crucial to prevent leaks and radioactive contamination of the steam leaving the steam generator to power the turbines.

Maintaining steam generator integrity over the full service life, especially as we extend the service life of ships, requires improving understanding of high temperature corrosion processes, assessment of potential causes and corrective actions, and development of alternative water chemistries which can inhibit or abate corrosion. Trace impurities become highly concentrated by the boiling process in areas of low flow, and form deposits. The concentration of impurities in these deposits can become corrosive and threaten the integrity of the unit. Development work focuses on evaluating corrosion mechanisms, devising methods to locate and remove deposits, minimizing input of impurities, and evaluating and testing water chemistries and corrosion inhibitors for benefits and drawbacks to ensure they mitigate the consequences of impurities over the life of the plant.

By utilizing advanced energy conversion devices, significant gains may be made to the power conversion generator and propulsion plant efficiencies which could potentially enable quieter, simpler, and more cost-effective Naval propulsion plants. This will support future Naval Nuclear propulsion feasibility assessments. Development work is underway for steam generator improvements to meet energy and power requirements for the Transformational Technology Core (TTC).

CVN 21 shipbuilding schedules and goals for reduced weight, manning, and life cycle costs, require development of an improved steam generator. Development work centers on new tubing materials, new corrosion controls, improved heat transfer methods, and steam separation predictive tools are used to meet goals of cost and weight reduction while enhancing performance.

Plant Technology	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Verifiable Supporting Activities:

FY 2003 Conduct steam generator thermal and hydraulic testing to support analysis tool qualification and reduced inspection frequency and cost for steam generators.

Continue to monitor and evaluate LOS ANGELES- and OHIO-class steam generators to reduce cost and frequency of inspections and cleaning.

Continue to design and build improved in-plant chemistry and electrochemistry monitoring capabilities to identify and reduce steam generator corrosion issues.

Continue development of advanced energy conversion systems incorporating state of the art technology and engineered improvements. Evaluate application feasibility of alternative energy conversion systems.

FY 2004 Pursue steam generator improvements and alternate designs required to meet the energy and power demands for TTC.

Perform additional evaluations and testing of emergent alternate energy conversion concepts and demonstrate larger scale advanced energy conversion systems achieving high energy conversion efficiency to support future cores.

Complete steam generator thermal and hydraulic testing to support analysis tool qualification and reduced inspection frequency and cost for steam generators.

Continue to monitor and evaluate LOS ANGELES- and OHIO-class steam generators through the use of corrosion testing to reduce cost and frequency of inspections and cleaning, as well as prolong steam generator service life.

Continue to implement use of in-plant corrosion monitors in prototype steam generators to provide data-defining actual conditions in operating steam generators.

FY 2005 Develop larger scale integrated thermophotovoltaic system with high energy conversion efficiency and power density.

Evaluate use of alternate chemistry treatments and proceed with qualification for use in applicable LOS ANGELES-class submarines to assure corrosion limits for the life of the ship are not exceeded.

Complete work to provide a down select recommendation for the steam generator design with longer life and higher power rating supporting TTC.

(dollars in thousands)

Continue to monitor and evaluate LOS ANGELES- and OHIO-class steam generators through the use of corrosion testing to reduce the cost and frequency of inspections and cleaning, as well as prolong steam generator service life.

Continue to implement use of in-plant corrosion monitors in prototype steam generators and other components to provide data-defining actual conditions in operating steam generators for potential fleet application.

	FY 2003	FY 2004	FY 2005
B. Develop instrumentation and control equipment to replace obsolete equipment and improve reliability and performance	**44,880**	**50,800**	**63,800**

Naval reactor plant operators rely on instrumentation to monitor plant conditions, take corrective action, and determine position and speed of the control rods used to regulate reactor output. Safe and reliable operation of the plant is dependent on the reliability and performance of this equipment. Improved performance characteristics of instrumentation and control equipment is key to improving reactor performance and extending reactor core life. The development of highly reliable and efficient advanced electrical conversion equipment can increase actual usable power available from the reactor.

The Naval Reactors program has taken advantage of advancements in microprocessor-based instrumentation and control (I&C) equipment to increase instrumentation accuracy and to improve reactor operations. In the past, unique I&C equipment was designed for each class of ships. In some cases, ships in the same class have different equipment. Development of special purpose instrumentation and control equipment for single applications is costly and creates logistics problems in maintaining an inventory of spare parts for many different systems. It also requires additional training for operators. Therefore, it is necessary to develop "generic" I&C equipment that uses commercially available technology (modified for military use) that can be backfit into existing designs, is easy to upgrade as technology evolves, and can be used in all fleet applications with only minor modifications for ship specific needs. Generic I&C equipment, which establishes common system architecture for all plants, will reduce costs of acquisition, maintenance and logistics, and will allow development of specific applications to new plants in about one-half the time of the current 10-year cycle.

Verifiable Supporting Activities:

FY 2003 Conduct design, testing, and qualification of power conversion technology and selected solid state motor drives with advanced control techniques for proof-of-concept testing.

Begin detailed design of a CVN 21 reactor plant instrumentation system and issue CVN 21 functional requirements.

Complete LOS ANGELES-class generic I&C production equipment fabrication and NIMITZ-class production equipment design and fabrication.

Plant Technology	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

FY 2004 Install improved generic I&C equipment in LOS ANGELES-class ships and complete composite test facility procedure checkout and crew familiarization.

Design, develop and qualify field changes to address emergent needs for I&C equipment changes and parts obsolescence in order to improve reliability of existing hardware in operating plants.

Commence development of OHIO-class system laboratory models. Complete OHIO-class functional requirements and conduct further development of system laboratory models.

Continue design, testing, and qualification of power conversion technology and solid state motor drives with advanced control techniques to improve efficiency, maintenance, and performance.

Continue detailed design of a CVN 21 reactor plant instrumentation system with state-of-the-art equipment capabilities compatible with a vendor base.

FY 2005 Initiate design concepts for a replacement solid state or vacuum circuit breaker technology to provide circuit breakers with no moving parts to improve reliability.

Develop modifications to I&C systems to support TTC goals for an extended core life.

Develop selected motor drive technology incorporating advanced control techniques while meeting the unique shipboard applications of the VIRGINIA-class.

Initiate OHIO-class generic instrumentation and control preproduction equipment fabrication. Start evaluation testing to identify potential problems before design finalization and minimize development costs

Continue detailed design of a CVN 21 reactor plant instrumentation system with state-of-the-art equipment that will have a common system architecture for all reactor plant types of its class.

Plant Technology	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
C. Develop and test reactor plant components and applicable enabling technologies which address known limitations and improve overall reactor plant systems performance and reliability……..………………………………..	**34,097**	**38,325**	**38,100**

Naval Reactors evaluates current technologies and applies them to develop simpler components that maximize plant efficiency, reliability and safety. For example, the main coolant pump used in the NIMITZ-class carrier reactor plant, originally designed in the early 1960's, is being redesigned for placement on CVN 77 to incorporate current technologies addressing problems related to wear, improving performance and reliability over the pump's operating life.

Studies are also underway to design, develop, and test enabling technologies that will improve the military characteristics and affordability of future Naval nuclear propulsion plants without compromising safety or performance. Specific reactor plant system and component design work is ongoing for application to VIRGINIA-class submarines and the next-generation aircraft carrier, CVN 21, which will provide improved capability and a simplified, more affordable propulsion plant. Simplifying the reactor plant will not reduce the reliability of the plant. Improvements will provide for a greater ease of operation and more power available for other uses throughout the ship.

Additionally, improvements to reactor plant components are needed for the development of the Transformational Technology Core which could extend ship life by at least 30% and increase power output in VIRGINIA-class ships.

An important consideration in each redesign is fluid flow through each component and system in the reactor plant because pressure changes in each component have an effect on flow through the core. Deviations from nominal flow can cause a heat level imbalance within the core; therefore, strict tolerances are essential for safe and efficient operation of the entire plant. Each component design is flow tested to ensure it operates within the intended design range and that it will operate reliably over extended periods of operation.

Verifiable Supporting Activities:

FY 2003 Continue to resolve reactor plant systems and component design issues in support of VIRGINIA plant construction.

Continue design of CVN 21 reactor plant fluid systems and complete development of design details. Begin development of the CVN 21 reactor plant operating procedures.

Continue design of the CVN 21 main coolant pump and continue manufacture of the prototype CVN 21 Reactor Coolant Pump.

Continue design of the CVN 21 steam generator and pressurizer. Prepare detailed ordering requirements for fabrication.

FY 2004 Perform development work on improvements to plant components (e.g. pressurizer, reactor coolant pump) to enable performance enhancements commensurate with the anticipated performance of the Transformational Technology Core.

Finalize resolution of reactor plant design issues in support of VIRGINIA construction to have an arrangement which incorporates innovative construction techniques and which is technically sound and economical to build.

Complete design of the CVN 21 main coolant pump so that it incorporates the latest technologies and is affordable. Complete the manufacture of the prototype CVN 21 Reactor Coolant Pump and initiate engineering qualification testing

Complete design of the CVN 21 steam generator and pressurizer incorporating the latest technologies while remaining affordable. Initiate shipset fabrication.

Continue design of CVN 21 reactor plant fluid systems and continue development of the CVN 21 reactor plant operating procedures in order to develop a primary propulsion plant that is less costly to build, operate, and maintain.

FY 2005 Initiate design activities necessary to increase VIRGINIA plant life and power capability to correspond with TTC insertion.

Evaluate, develop, and test new features and materials in various VIRGINIA reactor coolant pump components to improve motor and hydraulic efficiency.

Continue design of CVN 21 reactor plant fluid systems and continue development of the CVN 21 reactor plant operating procedures in order to develop a primary propulsion plant that is less costly to build, operate, and maintain.

Continue engineering qualification testing of the CVN 21 reactor coolant pump.

Continue design of the CVN 21 reactor plant to provide a more affordable reactor plant requiring less maintenance, less manning, and can be built using modular construction techniques.

Plant Technology	FY 2003	FY 2004	FY 2005
	(dollars in thousands)		
D. Perform reactor plant analyses to ensure safe operation and improve reactor plant chemistry controls to reduce corrosion and plant radiation levels…………………………..	**9,423**	**9,700**	**9,700**

Under pressure, the reactor core heats primary system water that flows through the steam generator. The steam generator absorbs the transferred heat in the secondary water system, producing steam to power the turbines. Any corrosion products present in the primary reactor water cycle will be carried through the plant and irradiated in the core. Build-up of corrosion products in the core acts as insulation and narrows the water channels, reducing flow and heat transfer.

Proper chemistry control and constant water purification is crucial to reducing corrosion. Development work focuses on improving primary side chemistry and surface conditioning technology to reduce corrosion and permit improved design and the reduction of radiation levels. A constant flow of data from test facilities and operating plants plays a key role in the development process.

Detailed reactor system performance analyses are also performed to ensure Naval reactor plants are safe during normal, transient and casualty conditions. The advanced integrated reactor plant protection systems that provide automatic reactor shutdown when the operating limits established by the performance analyses are exceeded ensure the plant will operate safely and reliably during all phases of operation. Requirements in the area of protection analysis are constantly evolving due to extended plant design life and increased plant capabilities. Improvements to analysis codes are needed to achieve compliance with these evolving demands. As new test data becomes available, comparisons with analysis predictions are made and identify the need for improvements in predictive capability. State of the art analysis techniques are under development to meet these dynamic needs.

Through continuous improvement in chemistry, reactor protection system analyses, and advances in metallurgy discussed in the Materials Development and Verification category, Naval Reactors has consistently maintained radiation levels well below regulatory requirements and maintained an enviable record of safeguarding the environment, health of the crew, and servicing personnel. These advances have also provided enhanced reliability and a reduction of maintenance costs.

Verifiable Supporting Activities:

FY 2003 Qualify use of advanced reactor coolant chemistry analysis methods in OHIO- and NIMITZ-class ships to improve the quality of data and reduce operator training requirements.

Continue to monitor results of special treatment in reducing radiation levels in LOS ANGELES-class ships.

Continue to evaluate open items and emergent issues to support the VIRGINIA-class reactor systems performance analysis.

Plant Technology	FY 2003	FY 2004	FY 2005

(dollars in thousands)

Continue to perform the necessary reactor protection analyses for the CVN 21 final core design.

FY 2004 Evaluate initial test problem issues and results for impact on VIRGINIA-class reactor systems performance analysis.

Continue to monitor results of special treatment in reducing radiation levels and associated personnel exposure during maintenance evolutions in LOS ANGELES-class ships.

Implement use of advanced reactor coolant chemistry analysis methods in OHIO- and NIMITZ-class ships to improve the quality of data and reduce operator training requirements.

Continue to perform reactor protection analysis to support development of the CVN 21 Primary Nuclear and Core Protection Instruments in order to optimize the operational flexibility of CVN 21 and ensure the safe operation of the reactor.

FY 2005 Support development of automated primary chemistry equipment for CVN 77 construction and fleet application including CVN 21 in order to reduce crew time for chemistry control and analysis, thereby reducing crew radiation exposure.

Continue to evaluate results from special treatment demonstrations in LOS ANGELES-class ships to facilitate reduced radiation levels and associated personnel exposure during maintenance evolutions.

Continue use of advanced reactor coolant chemistry analysis methods in OHIO- and NIMITZ-class ships to improve the quality of data and reduce operator training requirements.

Continue to perform reactor protection analysis to support development of the CVN 21 reactor plant design prior to the initial operation of the plant in order to optimize the operational flexibility of CVN 21 and ensures the safe operation of the reactor.

Total, Plant Technology	**108,897**	**130,625**	**155,500**

Detailed Justification

Reactor Technology and Analysis	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Mission Supporting Goals/Objectives:

Reactor Technology and Analysis supports the work required to ensure safety and reliability of operating reactor plants in U.S. warships, extend the operational life of Navy nuclear propulsion plants, support Navy acoustic requirements, and preserve the Program's level of excellence in radiological and environmental control. Work focuses on developing a greater fundamental understanding of reactor behavior; designing new, longer lived reactors with improved reliability, efficiency, and greater energy density; improving and streamlining manufacturing and assembly processes to achieve cost savings and reduce waste; developing production techniques that incorporate new materials and processes; and continuing a record of excellence in safety.

Development of reactor design and analytical techniques provides a more accurate forecast of reactor performance, thereby yielding next generation designs of a more advanced nature. Likewise, work is underway to improve analysis tools to better understand performance over longer core and reactor lifetimes, which will reduce overall cost.

Development and qualification of core and reactor component thermal/hydraulic designs will further optimize reactor power while reducing coolant flow, thus facilitating improved acoustic performance. To accomplish this, emphasis is on thermal/hydraulics, structural/fluid mechanics, vibration analyses, and nuclear core design/analysis work. In addition, improved core manufacturing processes and inspection techniques also are being pursued to improve efficiency and support extended life requirements.

Other initiatives are dedicated to designing and testing simpler, more reliable reactor equipment, and developing improved shield designs that reduce cost and minimize weight without increasing personnel radiation exposure. Radiological and environmental monitoring and controls ensure operations are conducted without adverse impact on employees or the environment.

Reactor Technology and Analysis	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

I. Conduct planned development, testing, examination, and evaluation of nuclear fuel systems, materials, and manufacturing and inspection methods to ensure naval nuclear reactors are able to meet Navy goals for extended warship operation.

	FY 2003	FY 2004	FY 2005
A. Improve nuclear reactor core design and analysis methods and develop improved designs to satisfy service life requirements.	**63,800**	**66,115**	**69,000**

The demand for extended service life and for increased operational flexibility necessitates achieving a better understanding of the reactor core environment. As testing provides more comprehensive data, new analytical models can be qualified, which establish new, or revise existing core performance criteria. Reactor operating guidelines are developed according to these new or revised criteria.

Engineering analyses and testing in the areas of nuclear analysis, thermal-hydraulics, structural mechanics, fluid mechanics, dynamic structural load tests, and shock and vibration are needed to show the acceptability and performance of the core and reactor component designs.

New designs such as the next generation reactor (NGR) for VIRGINIA-class submarines, high energy reactor (HER) being developed for the new CVN 21-class aircraft carriers, and Transformational Technology Core (TTC) and less restrictive operating limits derived from improved design codes will enable new reactors to meet service life and performance requirements. The NGR core for the VIRGINIA-class is the first designed from inception to last the life of the ship. The core for CVN 21 will provide greater than 25 percent more energy than the NIMITZ-class cores. TTC will use advanced reactor core materials to gain a significant energy increase without increasing size or weight, and follows NGR as a life-of-the-ship core.

Development work for new core designs entails using independent models and analysis techniques to calculate and validate the structural and thermal-hydraulic design of the new core. The long-term goal of this work is to develop and fully qualify fundamental two-phase, three-dimensional thermal-hydraulic and structural models to accurately predict core performance under all operating and casualty conditions, and to do so using fewer approximations resulting in reduced uncertainties and associated costly conservatism in advanced reactor design. Key reactor plant components and design features are tested under prototypic operating conditions to demonstrate the mechanical, thermal-hydraulic, and flow-induced vibration acceptability of the design and manufacturing processes.

Verifiable Supporting Activities:

FY 2003 Design and initiate performance-mapping tests for advanced energy conversion test arrays to aid in the development of high efficiency direct heat-to-electricity energy conversion devices.

Develop improved parallel processing capabilities for computationally intensive structural analyses to enable enhanced review capability to optimize reactor design.

Complete core mechanical design and analysis and issue drawings to support initiation of A1B core manufacturing.

Continue A1B reactor hydraulic and mechanical design qualification tests and procure equipment for flow and shock/ vibration test programs for A1B fuel cell to validate the design and improve hydraulic and structural design methods.

Continue preparations for the VIRGINIA critical test program.

FY 2004 Initiate A1B hydraulic, flow-induced vibration and shock test programs for the A1B fuel cell that validate the design and improve hydraulic and structural design methods.

Pursue integration of core performance analysis codes to be applied to development of the TTC.

Perform thermal-hydraulic analysis evaluations to extend high power capability to longer lifetimes and higher power gradients demanded by TTC.

Integrate advanced energy conversion test arrays into system concepts and tests to demonstrate improved system efficiency.

Initiate development of an A1B core design utilizing lower enriched fuel for use in CVN 21 follow ship.

Update thermal-hydraulic engineering processes to improve design and analysis work efficiency and continue long-term operation support.

Complete the VIRGINIA critical test program.

Continue to develop improved parallel processing capabilities for computationally intensive structural analyses and implement methodology to remove excess conservatism from fracture analysis procedures.

FY 2005 Complete design analyses on A1B to support core certification. Additionally, provide structural and thermal-hydraulic analyses and assessments to resolve unforeseen manufacturing developments encountered with A1B core production.

Complete TTC core conceptual design and initiate final design and development work.

Continue A1B hydraulic and mechanical fuel cell testing to validate the design.

Complete development of an A1B core design utilizing lower enriched fuel for use in the CVN 21 follow ship.

Perform a comprehensive review of NR Program service experience to validate/calibrate fatigue crack growth procedures and total fatigue life. Pursue development of advanced material models appropriate for cyclic elastic-plastic finite element analysis to produce more efficient structural designs for reactor plant components.

Provide conceptual studies of reactor designs using high temperature fuel systems that can provide increased energy density in an advanced pressurized water reactor (PWR) application.

	FY 2003	FY 2004	FY 2005
B. Evaluate and test improved fuel and core-manufacturing processes and inspection techniques to support extended life of reactors	**28,800**	**39,000**	**34,600**

Desirable new core design features and the drive for cost savings necessitate manufacturing process improvements. These improvements are dependent on technological advancements. Fuel and core manufacturing limitations in previously designed naval reactor cores require compensatory margins in core designs and operating limits that constrain power density and life expectancy. Modifying the fuel and core manufacturing process allows cores to operate longer and with greater power output capability. In addition, the modified manufacturing process will minimize waste. This process is technically challenging, but necessary to improve the fuel to produce more energy-dense cores, such as TTC, at a lower cost for new core designs.

Verifiable Supporting Activities:

FY 2003 Construct additional model elements and core structural components with new reactor manufacturing techniques to reduce fuel costs and verify new inspection technologies to improve inspection efficiency and reduce reliance on destructive tests.

Complete fuel element process qualifications to support starting A1B core manufacturing.

Continue fabrication of prototypes to refine the fuel systems and assembly process required for CVN 21 prior to committing resources to large-scale production.

Initiate production efforts associated with the lead A1B core and identify new technologies to improve baseline processes.

(dollars in thousands)

FY 2004 Continue production efforts associated with the lead A1B core and identify new technologies to improve baseline processes.

Conduct manufacturing development for TTC utilizing advanced clad and fuel materials.

Conduct extensive fuel, fuel element, and fuel assembly development work to determine whether to commit to a full-scale demonstration core in a VIRGINIA-class ship.

Continue to construct additional model elements and core structural components with new reactor manufacturing techniques to reduce fuel costs and evaluate new inspection technologies to improve inspection efficiency and reduce reliance on destructive tests.

FY 2005 Evaluate results of initial A1B core production efforts and identify changes to be evaluated to improve the baseline processes.

Evaluate core vendor test procedures for discriminating between 93% and 97% enriched fuel and qualify low-enriched fuel for S9G fuel element use.

Conduct TTC manufacturing development utilizing advanced clad and fuel materials to support qualification efforts for use in the first VIRGINIA-class low-enrichment core.

Continue fabrication of model elements and core structural components to qualify new reactor materials, designs, and manufacturing and inspection technologies for future core technologies.

II. Complete scheduled design, analysis, and testing of reactor plant components, systems, and performance to ensure the operational safety and reliability of reactor plants for use in Navy nuclear powered warships so they can fulfill their national defense mission.

	FY 2003	FY 2004	FY 2005
A. Design and test improved reactor equipment, including advanced control drive mechanisms	**42,000**	**35,100**	**35,100**

Reactor safety/reliability demands that the mechanisms that drive control rods to moderate the reactivity of the reactor perform without incident. The NGR control drive mechanism is the first fundamentally new mechanism to be designed in 25 years. With the design in the final stages of qualification, remaining testing focuses on providing consistent rod control and protection against potential casualties for the entire life of the ship. For the A1B reactor plant, a new scaled-up control drive mechanism is required. The sheer size of the control rod presents engineering challenges for mechanism design. One challenge is the design and development of bearings required to operate for sixty years. Not only must the new control drive mechanism be developed to handle an unprecedented load, but it is also constrained by plant-wide limitations on space and mechanism operating power. Additionally, a more accurate control rod position indicator is being developed to meet increased plant control and safety goals. In addition to increased reliability, these new designs should prove to be simpler and less expensive than past designs.

Naval Reactors also must develop and qualify reactor heavy equipment, including reactor vessels, closure heads, closure studs, and core baskets to accommodate new core designs. Work is focused on extending technologies developed for NGR equipment to the design of the CVN 21 reactor equipment and supporting longer carrier service lives. As part of this effort, three-dimensional structural analysis tools will be developed and applied.

Verifiable Supporting Activities:

FY 2003 Complete final design of the A1B control drive mechanism (CDM) and fabrication of the CDM Lead units for prototypical tests that demonstrate that they function as intended.

Complete final engineering certification of the reactor vessel and closure head that shows on paper that all design requirements have been met.

Continue A1B reactor heavy equipment structural analyses and design reviews and complete closure head and core basket final design.

Continue design of the reactor head area to include tolerance, alignment studies, structural analyses, and design compliance checklists to ensure trouble-free assembly at the shipyard and successful operation for the life of the ship.

FY 2004 Conduct life and shock and vibration tests on the A1B CDM Lead Units and resolve design issues experienced during CDM prototype fabrication.

Initiate limited development of control rod drive mechanisms bearing lifetime to support extended TTC lifetime.

Continue detailed A1B reactor engineering analyses and design reviews and complete closure head and core basket final engineering certification.

Continue detailed design of the reactor head area to include tolerance, alignment studies, structural analyses, and design compliance checklists to ensure trouble-free assembly at the shipyard and successful operation for the life of the ship.

FY 2005 Complete engineering certification for the A1B CDM and A1B reactor heavy equipment.

Conduct shock testing of the A1B casualty monitoring instrumentation and head area arrangement (HAA) components.

Initiate thermal/structural analyses for TTC pressure vessel.

Continue development of control rod drive mechanism bearing lifetime to support extended TTC lifetime.

B. Perform physics testing and analysis to confirm expected fuel system and core performance and develop improved analysis methods for predicting core performance that reduce design approximations, uncertainties, and associated conservatism..............................	**21,100**	**21,000**	**21,000**

The first cores Naval Reactors developed had expected service lives of two years. Subsequent research and development resulted in core service lives of over twenty years, and current design work will deliver a life-of-the-ship core that will last over thirty years.

While yielding significant advantages in terms of reduced radiation exposure, reduced cost, and increased ship availability, the longer core life is pushing nuclear analysis tools beyond proven experience. These tools are limited in their ability to accurately predict core physics performance in later phases of core-life. Consequently, Naval Reactors is developing improved methods and tools to continue safe and reliable operation at stages in life which extend well beyond current operating experience.

Physics models use approximations that limit design precision and require allowances to be built into the design. Naval Reactors is developing, and has begun using, advanced, more precise nuclear design methods and software that reduce uncertainties and associated costly conservatism in advanced reactor design. The reduction in uncertainty and bias applied to core reactivity predictions is accomplished by resolving more accurate predictions of power levels in the various regions of a core under transient and steady state conditions. This resolution leads to reduced costs and improved reactor performance and enables attainment of higher performance, more cost-effective, and safe nuclear designs.

Qualification of these improved analytical and design methods require extensive testing, comparison of calculations to experimental results and operating experience, and validation of predictions against prototype core measurements. Likewise, differences between calculations and experimental results must be resolved and the results factored into improved methods and computer programs.

Reactor Technology and Analysis

(dollars in thousands)		
FY 2003	FY 2004	FY 2005

Improved basic nuclear data, such as neutron cross-sections, are needed to improve performance of existing cores and optimize new core designs. Naval Reactors is working to identify and perform experimental programs that would lead to improvements in this area.

Verifiable Supporting Activities:

FY 2003 Initiate physics analyses needed to establish detailed CVN 21 operating limits and control system characteristics.

Measure and test new cross-section data derived from linear accelerator experiments to improve accuracy of nuclear design calculations.

Improve accuracy of core burn-up predictions by applying improved physics methods, modeling procedures and cross section data.

Continue to evaluate physics data from late-in-life operation of the advanced fleet reactor prototype core to validate performance predictions for S6W.

FY 2004 Implement advanced solution strategies to improve reactor physics computation efficiency for supercomputers and distributed computing environment.

Develop physics data required to support the conceptual design phase for TTC.

Continue physics analyses needed to establish detailed CVN 21 operating limits and control system characteristics.

Continue to measure and test new cross-section data derived from linear accelerator experiments to reduce uncertainties in nuclear design calculations for emergent core concepts.

Continue to evaluate physics data from operation of prototype cores to validate performance predictions for fleet cores.

FY 2005 Develop physics data required to support the reference design phase for TTC.

Evaluate physics data from VIRGINIA-class initial criticality and physics acceptance tests.

Perform nuclear design and analysis to develop TTC core design and to support initial manufacturing development.

Perform reference design analyses for the NGR core to accept the use of low-enriched (93%) fuel.

Continue to evaluate physics data from operation of prototype cores to validate performance predictions for fleet cores.

Continue to measure and test new cross-section data derived from linear accelerator experiments to reduce uncertainties in nuclear design calculations for emergent core concepts.

	FY 2003	FY 2004	FY 2005
C. Conduct reactor safety and shielding analyses for nuclear reactor plants to ensure containment of radiation and proper protection of personnel	**13,800**	**13,700**	**13,700**

Naval Reactors conducts reactor safety analyses of all plants and new core designs to ensure that their operation poses no threat to operators or the public. Safety assessments are conducted for specific reactor plant designs to identify any potential safety vulnerabilities and assess the likelihood of a core-damaging casualty. Additionally, commercial nuclear power activities are monitored for applicability to NR plants.

Shielding analyses are also conducted to ensure effective attenuation of radiation and continued safe operation. Alternative shield and plant materials and fabrication methods are sought to improve shield effectiveness, while improving reactor plant affordability, reducing weight, and eliminating the use of hazardous materials such as lead. Shielding analysis method improvements permit a more accurate prediction of radiation shielding effectiveness, as well as the extent of radiation received by personnel, reactor components, and materials. As a result, shielding is better optimized to reduce radiation exposure to personnel and equipment during reactor plant servicing and operation and during the handling and shipment of spent nuclear fuel and other highly radioactive materials. Naval Reactors is working to reduce the weight and resultant cost of installed shielding without impacting radiation exposure to personnel.

Verifiable Supporting Activities:

FY 2003 Determine the scope of thermal/hydraulic tests necessary to support A1B reactor safety modeling and analysis.

Evaluate improvements to neutron and gamma transport codes to support advanced shield designs that reduce shield weight and cost.

Complete the NRC/ACRS review of the next generation reactor and provide technical support as necessary.

Complete radiation analyses for final design of A1B reactor plant equipment.

(dollars in thousands)

FY 2004 Develop new shield materials for advanced plant design and develop and install new shield design software.

Implement improvements to neutron and gamma transport codes to support advanced shield designs and the more stringent TTC energy density in a cost-effective manner.

Perform penetration shield design studies and support validation of the shipyard CVN 21 penetration shield analysis.

Initiate detailed design of hardware to perform technical/hydraulic tests necessary to support A1B reactor safety modeling and analysis.

Initiate containment test program in support of A1B reactor plant safety analyses.

FY 2005 Complete the A1B penetration shield design. Additionally, evaluate alternate bulkhead configurations for weight and cost reductions via utilization of advanced materials.

Perform safety analyses for the A1B Safety Analysis Report and develop uncertainty methodology for A1B Best-Estimate Loss-Of-Coolant-Casualty analysis.

Continue design studies and validation of the shipyard A1B penetration shield analysis.

Evaluate shielding impact of propulsion plant design changes for CVN 21 follow-ship.

Initiate procurement of hardware for thermal/hydraulic tests to support A1B reactor safety modeling and analysis.

III. Accomplish planned core and reactor component/system design and technology development efforts to support the Navy's acoustic requirements.

	FY 2003	FY 2004	FY 2005
A. Develop and qualify improved core and reactor component thermal and hydraulic designs	**16,100**	**16,000**	**16,000**

The acoustic signature of a reactor is driven principally by the flow of water through the core. Reductions in the flow, and corresponding improvements in acoustic performance, are limited by the necessity to safely maintain reactor power, which requires a flow of water through the core to dissipate heat. Naval Reactors continues to improve core performance and quieting with advancements in thermal and hydraulic design which enable greater power per unit flow, allowing flow to be reduced while safely maintaining power.

Reactor Technology and Analysis	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Work in this area focuses on developing more advanced calculation methods and software used in thermal-hydraulic analytical models and codes. These improved tools will enable a more realistic approximation of flow requirements. This work is helping to deliver more balanced reactor designs with reduced reliance on expensive tests in reactor design.

Verifiable Supporting Activities:

FY 2003 Extend thermal-hydraulic analysis methodology to apply advanced codes to transient thermal-hydraulic analyses to reduce reliance on complex and expensive transient tests.

Update and complete additional testing of advanced code analysis that solves basic physical equations for flow and heat transfer.

Initiate development of advanced Computational Fluid Dynamics tools for prediction of broad band noise while continuing testing for development of thermal criteria.

FY 2004 Extend thermal-hydraulic analysis methodology to apply advanced codes to flow oscillation thermal-hydraulic analyses of A1B that are needed to enable a simplified, lower cost plant concept.

Develop additional advanced thermal-hydraulic analysis tools to reduce reliance on expensive testing

Perform testing to assess capability of Computational Fluid Dynamics tools for prediction of broad band noise.

FY 2005 Initiate work to extend advanced code and methodology to evaluate multi-channel analysis capability to improve core and component acoustic performance and core thermal performance.

Apply Computational Fluid Dynamics tools to predict advanced reactor design test data and to predict fundamental broad band noise data.

Evaluate flow oscillation and transient data to support A1B design basis.

Reactor Technology and Analysis	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

IV. Ensure no personnel exceed Federal limits for radiation exposure and no significant findings result from environmental inspections by state and federal regulators.

A. Conduct radiological control, environmental, and safety operations necessary to protect laboratory employees, minimize release of hazardous effluents to the environment, and comply with all applicable regulations	**43,000**	**42,700**	**42,700**

Proper control of radiological materials is paramount to the health and safety of workers, the public, and the environment. Naval Reactors enforces strict compliance with requirements for the management and disposal of radioactive, hazardous, and mixed waste. Additional procedures are in place to ensure full compliance with evolving environmental, health, and safety requirements. The principal focus of this environmental work is to prevent the creation of environmental hazards by minimizing wastes and preventing pollution. Areas where historical operations were conducted are evaluated to assess environmental impacts and determine the extent of remedial actions. Training is conducted to ensure radiological safety and environmental requirements are understood. Audits are routinely conducted to assess the adequacy of facilities and equipment, employee training, and effective enforcement of existing controls. Emergency response capabilities are in place to control or mitigate any problems, while personnel and affected work areas receive routine radiological monitoring to ensure exposure is within minimal limits. Environmental, safety, and industrial hygiene monitoring is performed to confirm operations do not impact Program sites or the surrounding communities.

Verifiable Supporting Activities:

All Years Survey and document radiological conditions; train personnel for all phases of radiological work and environmental work.

Maintain strict accountability methods and fuel handling for nuclear fuel.

Ensure compliance with all safety and environmental regulations; train personnel to comply with latest standards and practices.

Minimize the production and safely dispose of all waste in accordance with applicable regulations.

Characterize historical operations areas and determine appropriate remedial actions.

Audit compliance to all regulations to ensure effectiveness of controls.

Total, Reactor Technology and Analysis	**228,600**	**233,615**	**232,100**

Detailed Justification

Materials Development and Verification	FY 2003	FY 2004	FY 2005

(dollars in thousands)

Mission Supporting Goals/Objectives:

Materials Development & Verification work ensures shipboard reactor plants meet Navy goals for extended warship operation by developing materials that will withstand the rigors of the harsh naval reactor plant environment—irradiation, high temperature, high pressure, and corrosion—for fifty-plus years. Submarine and aircraft carrier reactor plants are also unique in that they must operate under rapidly changing conditions as the ships maneuver and change speed.

Examining or replacing materials in an operational reactor plant is especially difficult because of system complexity and personnel radiation exposure concerns; thus, it is imperative that materials be qualified prior to Fleet use. To support reactor plant material needs, materials exhibiting desired characteristics are identified, developed, and subjected to long-term, strenuous testing and verification to ensure they will meet demands. These materials are also continuously reassessed based on evolving knowledge, and analytical and testing techniques. Test data is collected from both destructive and non-destructive surveys of prototypical specimens and materials removed from service. This information is used to develop predictive models. The ability of these models to reliably predict material performance is vital to operating plant safety and is key to qualifying materials for longer lifetimes.

An important objective of this work is to drive the costs of materials and processes to as low a level as possible, without compromising the safe operation of naval reactors.

Work in this category is divided into three areas: core and reactor structural materials, plant materials, and irradiation testing. The first two areas concern the different challenges and demands placed on materials based on their location and function. For example, fuel materials used in the reactor core must maintain high integrity to retain radioactive fission products under intense heat and irradiation during operating lifetime, and they must continue to maintain that integrity over thousands of years when eventually they are placed into a long-term spent fuel repository. The materials used in plant pressure-boundary components must maintain the high integrity of the primary coolant boundary under high stress in a corrosive environment. Irradiation testing of specimens is performed at the Advanced Test Reactor (ATR) located at the Idaho National Engineering and Environmental Laboratory (INEEL). The specimens are subsequently examined at the Naval Reactors' Expended Core Facility in Idaho and the Radioactive Materials Laboratory (RML) at the Knolls Atomic Power Laboratory to obtain data that is used to support both core and plant materials development.

Materials Development & Verification provides the high performance materials necessary to ensure naval nuclear reactor plants meet Navy goals for extended warship operation and greater power capabilities in the most economical manner possible.

Materials Development and Verification	(dollars in thousands) FY 2003	FY 2004	FY 2005
I. Conduct planned development, testing, examination and evaluation of nuclear fuel systems, materials, and manufacturing and inspection methods to ensure naval nuclear reactors are able to meet Navy goals for extended warship operation.			
A. Develop improved nuclear fuel, core and reactor structural materials, which extend core lifetimes up to the life of the ship, and evaluate irradiation tests of new and existing materials to verify acceptable lifetime performance and to improve analytical capabilities	**48,800**	**48,000**	**52,800**

Materials used in a reactor core as fuel, poison, cladding, and structural pieces must be capable of maintaining their physical integrity in an operating reactor environment which subjects them to the harmful effects of irradiation, pressure, corrosion, and heat. These materials are required to withstand the harsh environment of an operating reactor for decades. Naval Reactors is pursuing the development and testing of economically attractive materials with improved physical or nuclear characteristics to support core life expectations of more than 30 years. Improvements in material characteristics offer the potential for increased core lifetime, reductions in analytical conservatism, and cost savings.

Quality control is an integral part of all materials work, and manufacturing processes are developed and refined to ensure materials are produced efficiently and to stringent specifications. The ability to qualify materials for specific core applications is dependent upon fabrication, welding and other process development, as well as testing and development of predictive models to cover design applications. For example, new welding materials, combined with potentially more efficient cost-saving processes, are being evaluated for application to naval reactor manufacturing and construction. Where appropriate, manufacturing and other process developments are qualified and released for vendor use.

Materials used in long life core designs must be qualified in advance by collecting data on their performance during tests, examining their condition after testing and at end of use, and assembling the collected data into sound predictive models.

Verifiable Supporting Activities:

Materials work supporting long life core concepts, by nature, involves extended testing conducted over many years. The verifiable supporting activities described below provide examples of evaluations and tests performed each year thus representing outcomes within the continuing general scope of work.

FY 2003 Prepare for operations of improved, newly- installed fuel fabrication process.

Develop advanced semiconductor materials for thermophotovoltaic (TPV) direct energy conversion and obtain performance data of materials to improve efficiency and reduce cost of cell, module, and system designs.

Materials Development and Verification	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Continue expended core examinations to improve understanding of zircaloy corrosion in naval cores and provide improved predictive capability.

Continue developing and implementing improved, cost effective joining techniques and processes for advanced materials, including fiber optic laser welding.

Continue long term evaluations of high-temperature, high-depletion fuel.

FY 2004 Evaluate the high temperature properties of new molybdenum alloys.

Conduct corrosion exams of USS OHIO fuel elements to validate performance of the OHIO-class submarine core.

Continue expended core examinations to improve understanding of zircaloy corrosion in naval cores and provide improved predictive capability.

Continue developing and implementing improved, cost effective joining techniques and processes for advanced materials, including fiber optic laser welding.

Continue testing, evaluating, and development of new high temperature fuel, and poison compatible with high temperature fuel.

FY 2005 Initiate operations in Fuel Development Laboratory including fuel fabrication, process and advanced element fabrication lines.

Examine and report on corrosion testing findings from Lawrence Livermore National Laboratory testing after four years of exposure. This testing supports the eventual disposal of naval spent cores in a geological repository.

Continue to provide design and field support for ECF exam equipment, including development of equipment technical manuals, user manuals, procedures, upgrades to equipment and resolution of trouble records in support of OHIO fuel examinations.

Support materials non-destructive testing research and development needs for new design equipment and major equipment modifications.

Initiate irradiation testing of high temperature molybdenum pressurized water reactor (PWR) elements in ATR.

Evaluate the pursuit of developing high temperature fuel technology for an advanced PWR application.

Materials Development and Verification	(dollars in thousands) FY 2003	FY 2004	FY 2005
B. Test and evaluate plant materials to characterize the long-term effects of the harsh operating environment and qualify improved materials and processes to ensure endurance requirements will be met………………………	**32,100**	**31,288**	**34,700**

The strength and integrity of materials used throughout the reactor plant are critical as degradation can lead to reduced performance, shorter lifetime, increased maintenance, or component failure. Consequently, Naval Reactors focuses on developing and qualifying high integrity, corrosion resistant materials that will provide performance and sufficient lifetimes to support increasingly longer lived nuclear cores. One of the leading concerns in material degradation is stress corrosion cracking. Stress corrosion cracking (SCC) is the damage potentially occurring to materials carrying high tensile loads exposed to fluids, radiation, and/or high temperatures. Other plant material concerns include embrittlement resulting from irradiation and the presence of cobalt corrosion and wear products, which increase the radiation level in the reactor compartment during maintenance operations. Development and qualification of low or non-cobalt materials are underway.

Naval Reactors employs various methods to test, evaluate, and qualify improved plant materials. Testing and evaluating plant materials provides needed science based performance measures, the ability to predict component performance, and a foundation for advanced material improvements. In addition to permitting development of cost effective remedial actions for existing Fleet problems, testing and evaluating plant materials supports advanced technologies for plants with life-of-the-ship reliability and for future high performance components. Materials that have been in service are examined to provide critical operating data on material performance and reliability. Non-destructive testing is generally less expensive and allows repeated examination of materials, as well as analysis of the material condition of components still in service; however, some key data on the strength and vulnerabilities of materials can only be obtained through destructive means. Requirements in FY 2005 increase to support SCC testing and various materials.

Verifiable Supporting Activities:

Because understanding the long term behavior of materials and phenomenon such as stress corrosion cracking (SCC) is an incremental learning process, the verifiable supporting activities described below represent milestones within the continuing overall effort.

FY 2003 Continue testing of nickel base alloys (wrought and weld metal) to verify hypotheses of SCC mechanisms for use in an advanced model for component stress corrosion cracking incorporating temperature, stress, and environmental variables to enable lifetime predictions of advanced component SCC performance.

Support studies of weld parameter changes with the objective of reducing weld residual stresses.

Materials Development and Verification	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Conduct corrosion and cracking tests on new, potentially more robust reactor plant materials using in-situ monitoring techniques.

Continue testing and qualifying improved, wear-resistant, low cobalt materials and evaluate their application to CVN 21 and future plant types.

FY 2004 Develop joint advanced SCC modeling to develop better tools for predicting material reactions to operating plant environment. The improved predictions can potentially decrease the number of required inspections and increase the time between required inspections.

Evaluate results from post-service exam of EISENHOWER core fasteners to support fleet applications and SCC model refinement.

Conduct testing to quantify the next generation reactor vessel material margin to ensure material is more resistant to brittle fracture.

Complete development and evaluation of low cobalt valve coating materials, which reduce both wear of plant machinery and radiation emission.

Initiate preparations for a new Low Level Examination Facility (LLEF) to support irradiated plant materials and component test evaluations.

FY 2005 Continue experimental programs on nickel base alloys and incorporate understanding of environmental, material, and stress effects into the joint advanced Stress Corrosion Cracking growth model. The improved predictions can potentially decrease the number of required inspections and increase the time between required inspections.

Develop fundamental model to test stainless steel behavior for environmental cracking.

Implement non-destructive test methods to replace destructive exams in core construction.

Test thermal embrittlement of pressure vessel steel to analyze integrity of pressure vessel steel.

Complete testing of irradiated fastener material to validate penalty factors on SCC and low temperature fractures. Focused tests will address core and valve fastener performance questions beyond the current D2W assessments.

Materials Development and Verification	(dollars in thousands) FY 2003	FY 2004	FY 2005
C. Conduct irradiation testing and perform detailed examinations to provide data for material performance characterization and prediction……………………………………….....	**55,059**	**57,600**	**63,300**

Exposing reactor materials to the harsh characteristics of irradiation compounds the demands caused by other environmental factors. The Advanced Test Reactor (ATR), located at the Idaho National Engineering and Environmental Laboratory, produces very high neutron flux, which allows the effects of many years of operation in other reactor environments to be simulated in as short as one-tenth the time. Subsequent evaluations of test specimens in the Expended Core Facility and the Radioactive Materials Laboratory facilities are the main source of data on the performance of reactor fuel, poison, and structural materials under irradiated conditions.

Operation of the facility is partly funded in the Evaluation and Servicing budget category Work in the Materials Development and Verification category includes fabricating test specimens for insertion into the ATR, designing irradiation test trains to expose materials to selected reactor conditions, and conducting interim and post-irradiation detailed examinations to analyze how the material withstood reactor operating conditions. Test trains are specially engineered structures that hold material specimens in place during irradiation, and are periodically inserted and withdrawn allowing acquisition of data from a wide variety of materials and configurations.

One of the advantages of the ATR is the precision with which the power level (or neutron flux) can be adjusted at the various test positions. An individual test train's internal arrangement and location in the ATR determines exposure to specific conditions. Requirements in FY 2005 support an increase in the number of test train irradiations, examinations, and shipments between ATR and NRF.

Naval Reactors continues to develop enhanced systems for high temperature irradiation testing with precise temperature control and environmental monitoring in the ATR

Verifiable Supporting Activities:

Testing and collection of data from these tests is an ongoing, often long-term activity. The verifiable supporting activities reflect significant testing work. These activities should be viewed as a part of the overall continuing effort.

FY 2003 Design and analyze an additional Multiple Irradiation Capsule Experiment (MICE) test train.

Increase the MICE work scope; the focus will be on improved real time neutron flux monitoring, the feasibility of obtaining accurate in-pile dimensional, thermal conductivity, and corrosion film measurements.

Develop and demonstrate advanced techniques for monitoring in-pile test specimens.

Materials Development and Verification	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Continue transient testing on alternate model fuel elements.

Continue irradiation of vendor-produced specimen of advanced fuel to qualify high integrity fuel for advanced reactor cores.

Continue long-term examination of irradiation tests to improve understanding of zircaloy corrosion and oxide blistering.

Remove RML in-cell waste to allow for increased evaluation capability.

FY 2004 Continue to establish the processes to qualify new fuel and cladding materials and manufacturing methods for advanced concepts core designs.

Continue MICE testing and manufacture irradiation test specimens.

Obtain data on irradiated fuel, poison, clad structural materials for use on current and advanced cores.

Continue transient testing on alternate model fuel elements.

FY 2005 Continue studies of fuel and cladding performance. These advanced examination techniques will be developed and deployed for high temperature fuel and structural materials.

Provide technical work documents and direction to assemble, disassemble, examine and ship irradiated tests between ATR and NRF.

Implement tests train cask containers, which are used to ship irradiated test specimens between ATR and NRF.

Continue to obtain data on irradiated fuel, poison, and clad and structural materials for use on current and advanced core.

Utilize assembly/disassembly table at ATR to handle test trains without need for transportation of table to ECF.

Total, Materials Development and Verification ……..	**135,969**	**136,888**	**150,800**

Detailed Program Justification

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Evaluation and Servicing work encompasses the operation, maintenance, and servicing of land-based prototype naval nuclear propulsion plants and the Advanced Test Reactor (ATR). It also includes the enhancement of Fleet reactor reliability and longevity through testing and examination of reactor materials, components, and new designs under prototypical operating conditions. Other important work funded by Evaluation and Servicing is the development of a spent fuel dry storage facility that will be integral to moving spent nuclear fuel from water pit storage to more environmentally benign dry storage at the Naval Reactors Facility (NRF), and remediation and environmental work at all Naval Reactors sites.

Evaluation and Servicing supports the performance measures for ensuring maximum availability of prototype plants in order to test and train safely; to responsibly inactivate already shutdown prototype plants; to operate test facilities to support Navy goals for extended warship operation, and to maintain excellence in radiological and environmental control.

Keeping the prototype plants, the Advanced Test Reactor (ATR), and Idaho Expended Core Facility (ECF) running efficiently is essential, as information obtained from testing provides valuable feedback for designing new cores and supporting operating Fleet reactor plants. Testing of materials, components, cores, and systems in these reactor plants provides important technical data and experience under actual operating conditions, thereby avoiding potential costly delays when designs are later inserted into the operating Fleet.

The accumulation of operational data from the prototype and Fleet operating plants, expended core examinations, and increases in the capability of computer modeling have enabled Naval Reactors to shut down six of the Program's eight prototype plants resulting in substantial cost savings. Work is aimed at dismantling and laying up the shutdown plants to place them in an environmentally benign state.

The Evaluation and Servicing category also funds ongoing cleanup of facilities at all Naval Reactors sites to reduce hazards to personnel, and reduce potential liabilities due to aging facilities, changing conditions or accidental releases.

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

I. Maintain a utilization factor of at least 90% for prototype plants to ensure their availability for scheduled testing, training, and servicing needs, and provide for development of servicing equipment and testing of plant components, materials and procedures.

A. Operate land-based test reactor plants to provide for prototypical testing, core depletion analysis, and reactor plant operator training	**40,200**	**42,000**	**42,000**

Naval Reactors operates the MARF and S8G prototypes on an around-the-clock basis to test and evaluate new/improved equipment, components, materials and operating procedures. Each prototype provides for testing under actual operating conditions far superior to a laboratory environment. A major objective is to aggressively deplete the advanced fleet reactor in S8G to gather data necessary to validate the design methods currently in use in both the SEAWOLF and VIRGINIA-class submarines. Additionally, the data collected is being used in the development of the CVN 21 aircraft carrier reactor as well as the next-generation submarine reactor core.

The MARF prototype is depleting the developmental materials core at varying power levels, and periodic physics tests are being performed to determine how the nuclear fuel reacts with an advanced poison material being tested in that core. These tests are conducted multiple times over the life of the core to verify predicted behaviors as the fuel depletes.

Naval Reactors performs routine preventive and corrective maintenance on the MARF and S8G prototypes, while also making necessary improvements, to ensure the plants remain in compliance with strict safety and reliability standards. Work necessary for safe, effective prototype operation includes: operating support systems essential for reactor plant operations; monitoring plant and equipment performance to ensure problems are promptly identified and resolved; performing routine radiological monitoring of plant operations and personnel radiation exposure; maintaining proper plant and support system chemistry control; replacing plant components as they age to ensure continued, reliable plant operations; and maintaining technical manuals to reflect changes in operating and test procedures.

Verifiable Supporting Activities:

FY 2003 Meet depletion objectives for MARF and S8G cores.

Conduct the fifth MARF low power physics test and various S8G high power physics tests and document results.

Upgrade site and prototype plant infrastructure including Site Service Water System modifications.

Evaluation and Servicing

FY 2003	FY 2004	FY 2005

FY 2004 Meet depletion objectives for MARF and S8G cores.

Complete Cooling Tower Maintenance in conjunction with the S8G Selected Restricted Availability (SRA).

Complete periodic integrity testing to verify continued satisfactory performance of the S8G prototype containment systems.

Conduct the seventh MARF high power physics test and various S8G high power physics tests and document results.

Test automated reactor coolant chemistry process at the S8G prototype in support of future Fleet usage. This will allow for more consistent reactor coolant chemistry, as automated adjustments are more precise than technician-measured, manual additions.

Test alternate power conversion device at MARF. When successful, this will replace motor generators in operating power plants, making power supply more reliable and easier to maintain.

FY 2005 Meet depletion objectives for MARF and S8G cores.

Perform steam generator inspection, and conduct periodic hull integrity test on the MARF prototype as part of planned shutdown periods. .

Conduct the sixth MARF low power physics test.

Perform Integrated Condition Assessment System (ICAS) testing in S8G prototype to support integration of ICAS with other enhancements thereby demonstrating automated techniques in order to reduce log-keeping burden on watchstanders while improving utility of logged data for trend analysis and maintenance.

Continue testing automated reactor coolant chemistry analysis equipment at the S8G prototype in support of future Fleet usage. This testing supports an FY05 delivery to the shipyard to support first installation in CVN 77.

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
B. Service land-based test reactor plants to ensure they continue to operate safely and efficiently, and develop equipment and procedures to provide for safe and efficient servicing of nuclear reactor plants …………..	**17,100**	**16,400**	**16,400**

In order to ensure continued safe and reliable operation of its prototype plants, Naval Reactors performs major servicing efforts according to strict timelines. A major non-refueling overhaul of the S8G prototype plant will be initiated in FY 2004 and completed in FY 2005, which includes a major inspection of key primary loop components, welds and joints. An extended shutdown of the MARF prototype plant will be completed in FY 2005, which includes a major inspection of key primary loop components. These inspections maintain the continued integrity and structural adequacy of the primary plant components and help to maintain the highest safety and operational efficiency standards.

Naval Reactors ensures that the efforts that coincide with defueling and refueling operations are considered as part of design and development of new reactor cores. Work in FY05 will focus on continuing work on the A1B reactor servicing design and developing these designs to enhance reactor fueling, maintenance and defueling capability. In addition, Naval Reactors is progressing well on the next-generation reactor servicing design to reduce servicing costs. Development of all-power-unit loading, maintenance and defueling equipment, all fueling and defueling software, planning documents, and analyses required for shipment and installation of the next-generation reactor power unit, as well as shipment and disposal of recoverable irradiated fuel and irradiated core components are all vital efforts in servicing design. This same work also is continuing for the CVN 21 reactor to ensure servicing capability through simplified operations to reduce overall CVN 21 costs.

Verifiable Supporting Activities:

FY 2003 Support A1B reactor equipment activities and evaluate reactor equipment designs to enhance reactor fueling, maintenance, and defueling capability.

Continue design work on next-generation submarine reactor maintenance software and hardware.

FY 2004 Develop A1B designs for reactor head area seal servicing to meet new core closure specifications, to include new designs for the control rod drive mechanism weld and cutting machines.

Begin a major non-refueling overhaul of the S8G prototype, including overhaul of the S8G main seawater valves, refurbishment of primary and secondary plant equipment, execution of component/weld inspections, and major upgrades to the hull insulation and weather protection system.

Perform a resin discharge at the MARF prototype.

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Continue development of detailed designs for CVN 21 reactor servicing equipment.

Continue next-generation submarine reactor maintenance hardware, continue development of maintenance capability software.

FY 2005 Continue development of detailed designs for A1B reactor servicing equipment to enhance reactor fueling, maintenance, and defueling capability.

Continue development of A1B designs for reactor head area seal servicing to meet new core closure specifications for core construction. (The new designs include control rod drive mechanism weld and cutting machines).

Complete a major non-refueling overhaul of the S8G prototype (including overhaul of the S8G main seawater valves and execution of component/weld inspections of the S8G plant).

Design new shipping containers to support refueling/defueling of NIMITZ-class carriers. This new container is needed to support the dramatically increased refueling needs for NIMITZ-class carriers.

Complete next-generation submarine reactor maintenance hardware and software design.

Perform an extended shutdown of the MARF prototype (including major inspection of steam generators).

	FY 2003	FY 2004	FY 2005
C. Operate and service the Advanced Test Reactor to provide for materials irradiations testing …………………………………………..	**17,896**	**18,000**	**18,000**

As the principal customer of the Advanced Test Reactor (ATR), Naval Reactors funds operation and maintenance of the reactor to support materials irradiations testing. This is the only facility in the nation capable of performing these tests. The ATR provides the ability to irradiate six train-type experiments with various flux conditions simultaneously in both the pressurized water or flowing gas loops. Actual testing is funded in the Materials Development and Verification category.

The ATR is the source of test data on the performance of reactor fuel, poison, and structural materials under irradiated conditions. The irradiation test program supports operating naval reactor plants, material selections made for the next-generation reactor, and database development that allows Naval Reactors to better understand emergent problems with existing reactors and to make informed material selections for new reactor designs.

Verifiable Supporting Activities:

All years meet operating efficiency goals.

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
II. Meet cost and schedule goals to safely and responsibly inactivate shutdown of land-based reactor plants in support of the Department's environmental clean-up goals.			
A. Continue efforts at the Windsor site in Connecticut to release applicable areas for unrestricted use ……………………………….	**500**	**100**	**0**

The S1C plant is defueled; inactivation is complete; and all facilities have been removed from the site. Completion of process to satisfy the EPA and the State of Connecticut such that the site may be released for unrestricted future use is expected in FY 2004. Required resources decrease simultaneously as documentation of inactivation work is finalized. The site will then be released for unrestricted future use.

Verifiable Supporting Activities:

FY 2003 Continue site closeout and release process.

Continue efforts required obtaining EPA and the State agreement on unrestricted release of property.

FY 2004 Complete site closeout and release process.

Release land for unrestricted future use.

FY 2005 None.

B. Continue inactivation efforts at the Kesselring site in New York to eliminate surplus facilities, remediate and dismantle plant facilities, and release applicable areas ……….	**12,700**	**15,200**	**15,200**

The S3G and D1G plants at the Kesselring site in New York are defueled. In 1997, an Environmental Impact Statement (EIS) and Record of Decision recommending prompt dismantlement of the S3G and D1G reactor compartments were issued. The EIS had public, state, and local government support. The S3G engine room has been completely dismantled. Ongoing site/reactor plant-related remediation work is planned for FY05 and future years. This work will reduce radiological and environmental hazard liabilities associated with historic prototype operations; however, such work is limited by funding constraints.

Verifiable Supporting Activities:

FY 2003 Complete removal, and ship out D1G pressure vessel for disposal.

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Continue S3G and D1G plant disassembly and disposal in accordance with the EIS Record of Decision and consistent with available funding.

FY 2004 Remove S3G primary shield tank.

Continue S3G and D1G plant disassembly and disposal in accordance with the EIS Record of Decision and consistent with available funding.

FY 2005 Continue S3G reactor compartment dismantlement.

Continue D1G reactor compartment dismantlement.

C. Continue inactivation efforts in Idaho to eliminate surplus facilities, remediate and dismantle plant facilities, and release applicable areas ………………………………..	**1,800**	**400**	**400**

All fuel has been removed from the prototype plants at the Naval Reactors Facility (NRF). The prototype plants are now in a safe lay-up condition, with all plants being maintained in a low-maintenance, environmentally benign state. Based on progress to date, Program priorities, and budget constraints, minimal site/reactor plant-related remediation effort is planned for FY 2005 and future years, with additional work to be performed, as funding becomes available.

Verifiable Supporting Activities:

FY 2003 Continue preparations for the current characterization and demolition of NRF buildings no longer needed.

FY 2004 Maintain plants in environmentally benign lay-up.

Demolition of NRF buildings no longer needed.

FY 2005 Maintain plants in environmentally benign condition.

Demolition of NRF buildings no longer needed.

	(dollars in thousands)		
Evaluation and Servicing	FY 2003	FY 2004	FY 2005

III. Maintain outstanding environmental performance by ensuring that no personnel exceed Federal limits for radiation exposure and ensure operations have no adverse impact on human health or the quality of the environment.

A. Conduct ongoing cleanup of site facilities to reduce potential hazards to personnel and reduce potential liabilities due to changing conditions or accidental releases ……………...	**30,589**	**40,003**	**31,910**

Operation of test, examination, and manufacturing facilities has involved the use of hazardous materials. Decontamination and unconditional release of previously contaminated facilities minimizes the potential of the environmental, health and safety impact of those facilities, with the benefit of making previous site areas available for reuse. This work reduces the potential for materials such as asbestos, heavy metals, other chemicals, or radioactivity to enter into the environment. To validate the effectiveness of remediation work, environmental monitoring and control efforts are in place to ensure compliance with all regulations at all Naval Reactors' sites.

Remediation is achieved through a deliberate multi-step process which may involve facility structures and equipment being cleaned, physically abraded, or removed according to strict engineering controls that protect personnel and the environment, and that minimize the amount of waste generated. Resultant wastes are packaged and disposed of off-site according to applicable requirements. Facilities are surveyed and sampled to verify that contamination has been removed.

Facilities and equipment are characterized to determine the extent and nature of cleanup needed. The results of these characterizations are analyzed and the work prioritized based on regulatory requirements and resources available to perform the work. As such, the order in which the following verifiable supporting activities are performed is subject to change based on this prioritization process.

Verifiable Supporting Activities:

FY 2003 Remove highly contaminated equipment from the obsolete fuel-processing facility in the L-Building at the Bettis-Pittsburgh site.

Sample, characterize, and remediate or remove, as necessary, radiological piping, tanks, sumps, pits, and other potential sources of environmental release and personnel exposure at the Bettis-Pittsburgh and KAPL-Knolls sites.

Provide engineering direction and subcontract preparation, placement, and execution for the repair and maintenance of the prototype buildings. Additionally, conduct remedial actions at NRF based on the Record of Decision.

Maintain lay-up support systems in working condition and perform environmental monitoring at the NRF site to ensure that the plants remain in a safe, environmentally benign state.

(dollars in thousands)

Evaluation and Servicing	FY 2003	FY 2004	FY 2005

Continue decontamination and removal of obsolete systems at ECF.

Continue decontamination and stabilization of selected Knolls site areas and removal of old test reactor facilities to reduce potential environmental liabilities.

FY 2004 Continue the removal of radiological legacy waste from Radioactive Materials Laboratory at KAPL-Knolls site.

Remove regulated materials from various buildings at KAPL-Knolls site.

Conduct remediation of obsolete facilities to reduce potential environmental liabilities at all program sites, such as the obsolete fuel facility at the Bettis-Pittsburgh site.

Develop the preliminary design efforts for establishing the infrastructure associated with the deconstruction of the Materials Evaluation Laboratory, Hot Waste Building, N-Building W4R and W5R laboratories, and piping servicing these facilities at Bettis-Pittsburgh.

Sample, characterize, and remediate or remove, as necessary, radiological piping, tanks, sumps, pits and other potential sources of environmental release and personnel exposure at the Bettis-Pittsburgh and KAPL-Knolls sites.

Continue waste processing in the Waste Reduction Facility.

Continue Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) remediation work at NRF site.

Continue environmental sampling and remediations at the KAPL-Knolls site.

FY 2005 Complete CERCLA remediation work at NRF.

Continue decontamination and disposition of the A1W Quench Tanks at NRF.

Plan decontamination of Water Pit #1 at NRF.

Plan for the dismantlement and disposal of Building 29, at the Kesselring Site, which includes three Solid Waste Management Units. Building 29 is an inactive wastewater collection system formally used by the S3G Prototype.

Perform decontamination and decommissioning of inactive facilities at all sites, including the obsolete fuel facility at Bettis-Pittsburgh, the Equipment Pit at NRF, and the Radioactive Materials Laboratory at KAPL-Knolls.

Plan and prepare for future deconstruction of the Materials Evaluation Laboratory, Hot Waste Building, N-Building W4R and W5R laboratories, and piping servicing of these facilities at Bettis-Pittsburgh.

Gather and evaluate sample chemical and radiological data at all sites. These evaluations are in compliance with Naval Reactors Program and RCRA requirements.

Perform RCRA remediation at Knolls, Kesselring and Bettis.

Support DOE Oakland Office preparations for the remediation of the former fissionable materials reprocessing facility, Separations Process Research Unit (SPRU).

IV. Conduct planned development, testing, examination and evaluation of nuclear fuel systems, materials, and manufacturing and inspection methods to ensure naval nuclear reactors are able to meet Navy goals for extended warship operation.

A. Examine removed fuel cells at end-of-life and perform non-destructive examinations of irradiated test specimens to confirm predicted performance and validate design methods …..	**31,190**	**37,590**	**48,090**

This effort concentrates on the examination of expended reactor cores and irradiated test specimens to provide data necessary for further operation of nuclear reactors in the fleet and future generation of nuclear reactors. The results of these examinations are used to reduce uncertainties in behavior of cores and components, to produce improvements in existing ship performance, and to extend reliable operational life. Predictive and analytical tools are updated based on differences between calculations and observed performance and are used to ensure the safety and improve the performance of reactor designs. This effort also provides for the development of new servicing systems required to temporarily store naval fuel at the Expended Core Facility (ECF) in Idaho and the eventual transfer of fuel to a permanent geologic repository. Current development efforts include the development of spent fuel dry storage capability, the conversion of ECF operations to be in accordance with the Naval Reactors Program standards and documentation requirements, and development of the systems required to safely transport and dispose of spent naval fuel in the permanent geologic repository.

Verifiable Supporting Activities:

FY2003 Provide waste disposal and shipping support for NRF.

Assemble, disassemble, and ship approximately 24 irradiated test assemblies between NRF and ATR.

Evaluation and Servicing	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005

Perform examinations of A1G/A4W and D2W core components.

Perform design and analysis of new equipment to establish production dry storage capability for spent naval fuel. This includes most of the major equipment designs, such as shielded basket transfer container, shield door, etc.

Initiate spent fuel dry storage at NRF.

FY 2004 Provide support for the establishment of production dry storage capabilities for spent naval fuel by evaluating materials and fuel elements to ensure they do not release fission products under environmental conditions found in the repository.

Provide general project support to prepare for and execute ECF construction projects.

Perform nuclear criticality and safety analyses to ensure configurations of moving and stored fuel elements meet safety standards.

Provide support for shipping of all hazardous and radioactive waste from NRF.

Perform design and analysis of remaining equipment to support startup of the production dry storage system at NRF. Perform design and analysis of equipment used for continued dry storage operations (e.g. baskets, grapples and control rod attachment equipment).

Perform design and analysis of new equipment to support initial shipments from INTEC to NRF for dry storage, such as baskets, grapples and supplemental nuclear poison equipment.

Perform design and analysis of new equipment for shipment of naval spent fuel to the geological repository. This includes transportation casks and cask lifting equipment.

FY 2005 Perform design and analysis of equipment used for continued dry storage operations (e.g. baskets, grapples and control rod attachment equipment).

Perform design and analysis of new equipment to support continued shipments from INTEC to NRF for dry storage, such as baskets, grapples and supplemental nuclear poison equipment.

Perform design and analysis of equipment to be used to ship spent fuel canisters to the national repository (e.g. transportation cask, cask-lifting equipment).

Design new underwater cutting equipment to support the dry storage of naval spent fuel.

Evaluation and Servicing	(dollars in thousands) FY 2003	FY 2004	FY 2005

Assemble, disassemble, and ship approximately 25 irradiated test assemblies between NRF and ATR.

Continue examination of S8G core components and commence fastener examinations.

Total, Evaluation and Servicing ……………………...	**151,975**	**169,693**	**172,000**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Plant Technology**	
I. A. Requirements increase to support the design for TTC	+ 12,100
I. B. Requirements increase as efforts are intensified to develop I&C equipment specifications for CVN 21 and TTC	+ 13,000
I.C. Requirements decrease because reactor plant component testing completed in FY 2004	- 225
▪ **Reactor Technology and Analysis**	
I. A. Funding level reflects increased A1B core manufacturing development	+ 2,885
I. B. Funding level reflects decreased TTC core manufacturing development	- 4,400
▪ **Materials Development and Verification**	
I. A. Requirements reflect an increase to support work at NRF	+ 4,800
I. B. Requirements reflect an increase in SCC testing and various materials	+ 3,412
I.C. Requirements reflect an increase due to increase number of Test Train irradiations, examinations, and shipments between ATR and NRF	+ 5,700
▪ **Evaluation and Servicing**	
II. A. Decrease due to completion of all site remediation.	- 100
III. A. Decrease due to delayed remediation efforts at Program facilities	- 8,093
IV. A. Increase due increased efforts to support moving from wet storage to dry storage at NRF	+ 10,500
▪ **Facility Operations**	+ 2,796
Total Funding Change	**+ 42,375**

Capital Operating Expenses & Construction Summary

Capital Operating Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
General Plant Projects	15,690	12,900	17,400	+ 4,500	+ 34.9%
Capital Equipment	25,796	35,115	33,411	- 1,704	- 4.9%
Total, Capital Operating Expenses ..	41,486	48,015	50,811	+ 2,796	+ 5.8%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Appropriations	FY 2003	FY 2004	FY 2005	Unappropriated Balances
Naval Reactors						
90-N-102 Core Facility Dry Cell	109,379	88,211	1,987	18,192	989	0
01-D-200 Major Office Replacement Building.................	12,383	10,297	2,086	0	0	0
03-D-201 Cleanroom Technology Facility..................	7,451	0	7,153	298	0	0
05-D-900 Materials Development Facility..................	17,400	0	0	0	6,200	11,200
Total, Construction..........		98,508	11,226	18,490	7,189	11,200

Major Items of Equipment *(TEC $2 million or greater)*

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior-Year Appropriations	FY 2003	FY 2004	FY 2005	Acceptance Date
Network Upgrade	2,800	0	0	1,000	1,000	FY 2006
Low Level Exam Equipment	5,100	0	0	320	3,970	FY 2006
Scalable Parallel Supercomputer	2,000	0	2,000	0	0	FY 2003
Scalable Parallel Supercomputer	8,000	0	0	8,000	0	FY 2004
High Performance Technical Computing System	8,200	0	0	0	8,200	FY 2005
Network Convergence	3,000	0	0	0	800	FY 2006
Total, Major Items of Equipment		0	2,000	9,320	13,970	

Program Direction

Funding Profile by Category

(dollars in thousands/whole FTE's)

	FY 2003 Comp Approp	FY 2004 Comp Request	FY 2005 Request	$ Change	% Change
Program Direction					
Headquarters					
Salary and Benefits	8,525	8,992	10,200	+ 1,208	+ 13.4%
Travel	530	550	560	+ 10	+ 1.8%
Support Services	0	0	0	0	0.0%
Other Related Expenses	903	2,067	2,990	+ 923	+ 44.7%
Total, Headquarters	9,958	11,609	13,750	+ 2,141	+ 18.4%
Full Time Equivalents	57	60	70	+ 10	+ 16.7%
Pittsburgh Naval Reactors					
Salary and Benefits	6,655	7,029	7,434	+ 405	+ 5.8%
Travel	130	135	142	+ 7	+ 5.2%
Support Services	0	0	0	0	0.0%
Other Related Expenses	970	1067	1,172	+ 105	+ 9.8%
Total, Pittsburgh Naval Reactors	7,755	8,231	8,748	+ 517	+ 6.3%
Full Time Equivalents	70	70	70	0	0.0%
Schenectady Naval Reactors					
Salary and Benefits	5,625	6,065	6,337	+ 272	+ 4.5%
Travel	95	106	108	+ 2	+ 1.9%
Support Services	0	0	0	+ 0	0.0%
Other Related Expenses	610	541	557	+ 16	+ 3.0%
Total, Schenectady Naval Reactors	6,330	6,712	7,002	+ 290	+ 4.3%
Full Time Equivalents	64	64	64	0	0.0%
Total Naval Reactors Program					
Salary and Benefits	20,805	22,086	23,971	+ 1,885	+ 8.5%
Travel	755	791	810	+ 19	+ 2.4%
Support Services	0	0	0	0	0.0%
Other Related Expenses	2,483	3,675	4,719	+ 1,044	+ 28.4%
Total, Program Direction	24,043 [a]	26,552 [b]	29,500	+ 2,948	+ 11.1%
Full Time Equivalents	191	194	204	+ 10	+ 5.2%

[a] This reflects a $157,000 rescission.
[b] This reflects a $148,000 rescission.

Description

Due to the critical nature of nuclear reactor work, Naval Reactors is a centrally managed organization. This places a heavy burden on the Federal employees who oversee and set policies/procedures for developing new reactor plants, operating existing nuclear plants, facilities supporting these plants, contractors, and the Bettis and Knolls Atomic Power Laboratories. In addition, these employees interface with other DOE offices and local, state, and Federal regulatory agencies.

The FY 2005 request includes requirements to support a full time equivalent increase of ten personnel to the Naval Reactors Program.

Detailed Justification

	(dollars in thousands)		
Program Direction	FY 2003	FY 2004	FY 2005
Salaries and Benefits	**20,805**	**22,086**	**23,971**

Federal Staff continue to direct technical work and provide management/oversight of laboratories and facilities to ensure safe and reliable operation of Naval nuclear plants. The change is due to projected salary adjustments in accordance with allowable inflation and achieving FTE target in FY05.

Travel	**755**	**791**	**810**

Travel includes funding for the transportation of Government employees, their per diem allowances while in authorized travel status and other expenses incidental to travel. FY 2005 funding supports travel required for the management and oversight of the Naval Reactors Program, in addition to inflationary growth between FY 2005 and FY 2004.

Support Services	**0**	**0**	**0**

Naval Reactors does not use Support Services contractors.

Other Related Expenses	**2,483**	**3,675**	**4,719**

Includes provision of funds for the Working Capital Fund, based on guideline estimates provided by the Working Capital Fund Manager. Funding also supports goods and services such as training and ADP maintenance, and includes labor costs for Bettis contractor services and ADP requirements for NR Headquarters' internal classified local area network.

Total, Program Direction	**24,043**[a]	**26,552**[b]	**29,500**

Explanation of Funding Changes

	FY 2005 vs. FY 2004 ($000)
▪ **Salaries and Benefits** The change is due to salary adjustments in accordance with allowable inflation and achieving FTE target in FY 2005	+ 1,885
▪ **Travel** The change is due to adjustments in accordance with allowable inflation	+ 19
▪ **Other Related Expenses** The change is due to increases in the number of personnel supported by headquarters and adjustments in accordance with allowable inflation	+1,044
Total Funding Change, Program Direction	**+ 2,948**

Other Related Expenses

(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Training	137	160	185	+ 25	+ 15.6%
Working Capital Fund and Rent	560	570	580	+ 10	+ 1.8%
Software Procurement/Maintenance Activities/ Capital Acquisitions	860	1,234	1,644	+ 410	+ 33.2%
Other	926	1,711	2,310	+ 599	+ 35.0%
Total, Budget Authority	2,483	3,675	4,719	+ 1,044	+ 28.4%

05-D-900, Materials Development Facility Building, Schenectady, New York

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2005 Budget Request	1Q2005	4Q2005	4Q2005	4Q2008	17,400	20,350

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
2005	6,200	6,200	2,500
2006	9,900	9,900	8,000
2007	1,300	1,300	6,400
2008	0	0	500

3. Project Description, Justification and Scope

A replacement industrial facility building is planned for construction at Knolls Atomic Power Laboratory (KAPL) to consolidate non-irradiated material development fabrication and characterization activities, which are currently located in five separate buildings, and to reduce life cycle cost. A detailed study found constructing a new building vice renovation and expansion of the existing buildings, which date back to the 1950's, is a more cost-effective method of maintaining these critical Program capabilities and over the next 30 years will yield a projected 22% life cycle cost savings. Due to historical radiological and hazardous materials contamination, existing facilities require decontamination prior to eventual demolition, which will reduce historical contamination liability.

The building will provide state-of-the-art industrial space and will be constructed to the latest energy efficiency and safety standards and will make use of low maintenance materials to minimize future cost. The building will be a two-story structure providing high bay, medium bay, laboratory space, and an open office layout to provide professional spaces for the technical and administrative personnel. The building's electrical and mechanical needs will be provided by a new double-ended load center and a 400-ton chiller to be located in the adjacent office building. The project will also purchase new equipment; however most of the equipment will be moved into the facility from existing facilities. KAPL has evaluated several alternatives including construction of a smaller building and a one-story building. All of these alternatives have higher life cycle costs and do not meet laboratory needs.

FY 2005 construction funds will be used for site preparation work, including demolition of existing facilities, modifications to existing site utilities, and final design of the building.

FY 2006 construction funds will be used to construct the building.

FY 2007 construction funds will be used to complete outfitting of the building.

This new facility will provide sufficient industrial space to house the Materials Fabrication Facility, the Component Fabrication Facilities, the Materials Characterization Laboratory, and the Science Autoclave Facility and will consolidate materials/fabrication laboratory efforts into one facility.

4. Details of Cost Estimate[a]

(Dollars in thousands)

	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs (Design drawings and Specifications)...............	730	0
Design Management costs (1.0% of TEC)	180	0
Project Management costs (0.1% of TEC)	25	0
Total, Engineering design inspection and administration of construction costs (5.4% of TEC)............	935	0
Construction Phase		
Buildings	8,700	0
Utilities (Electrical/Civil)	3,970	0
Standard Equipment (Modular Furniture/Office Equipment)	555	0
Removal less salvage	375	0
Inspection, design and project liaison, testing, checkout and acceptance................	335	0
Construction Management (5.1% of TEC)...	895	0
Project Management (0.5% of TEC)...	95	0
Total, Construction Costs	14,925	0
Contingencies		
Design Phase...	70	0
Construction Phase (8.4% of TEC)	1,470	0
Total, Contingencies (8.9% of TEC)...	1,540	0
Total, Line Item Cost (TEC)	17,400	0

5. Method of Performance

Contracting arrangements are as follows:

Building design/construction will be accomplished via one fixed price (design/build) contract awarded on the basis of competitive proposals (price to be the major factor). Utility installations, demolition security/roadway work, and major equipment installations will be performed using conventional competitive contracting methods.

[a] The cost estimate is based on conceptual design estimates.

6. Schedule of Project Funding

	Prior Years	FY 2004	FY 2005	FY 2006	Outyears	Total
Project Costs						
Facility Costs						
Design	0	0	200	735	0	935
Construction	0	0	2,300	7,265	6,900	16,465
Total, Line Item TEC	0	0	2,500	8,000	6,900	17,400
Preliminary Engineering Design Cost	0	393	7	0	0	400
Other Project Costs	0	0	50	131	919	1,100
Conceptual Design Cost	300	50	0	0	0	350
Decontamination and Decommissioning	0	90	810	200	0	1,100
Total, Other Project Costs	300	533	867	331	919	2,950
Total Project Cost (TPC)	300	533	3,367	8,331	7,819	20,350

7. Related Annual Funding Requirements

(dollars in thousands)

	Current Estimate	Previous Estimate
Annual facility operating costs [a]	861	861
Utility costs (estimate based on FY 2002 rate structure)[b]	729	729
Total related annual funding	1,590	1,590
Total operating costs (operating FY 2008 through FY 2038)	67,383	67,383

[a] Includes personnel and M& R cost (exclusive of utility cost) for operation, maintenance, and repair of the MDF.

[b] Including utility cost for operation of the MDF which will begin in FY 2008.

90-N-102, Expended Core Facility Dry Cell, Naval Reactors Facility, Idaho

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost ($000)	Total Project Cost ($000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 1990 Budget Request *(Preliminary Estimate)*..........	1Q 1990	3Q 1991	3Q 1991	4Q 1995	48,800	49,936
FY 1996 Budget Request[a]	1Q 1990	4Q 1991	2Q 1993	4Q 1998	48,646	51,027
FY 1998 Budget Request[b]	1Q 1990	2Q 1999	2Q 1993	4Q 2001	62,046	79,604
FY 1999 Budget Request[c]	1Q 1990	2Q 2000	2Q 1993	4Q 2002	84,946	96,117
FY 2000 Budget Request[d]	1Q 1990	2Q 2000	2Q 1993	4Q 2002	86,846	98,694
FY 2002 Budget Request[e]	1Q 1990	2Q 2000	2Q 1993	4Q 2002	88,246	99,907
FY 2003 Budget Request[f].....	1Q 1990	2Q 2000	2Q 1993	2Q 2006	109,500	120,883
FY 2004 Budget Request[g]	1Q 1990	2Q 2000	2Q 1993	2Q 2006	109,379	120,826
FY 2005 Budget Request[h]	1Q 1990	4Q 2004	2Q 1993	1Q 2007	109,379	120,826

[a] Reflects changes due to a June 1993 Court Injunction which placed the Dry Cell Project on hold, until an agreement was reached between the Department of Energy and State of Idaho in October, 1995.

[b] Added the East End Modification to accommodate Dry Fuel Storage.

[c] Added the West End Modification to accommodate return of spent fuel from the Idaho Nuclear Technology and Engineering Center (INTEC) to the Expended Core Facility.

[d] Included additional funding to perform design and facility modifications to accommodate the potential use of a larger fuel module within the Dry Cell.

[e]Realigned contingency based on 45% completion of the West End Modification Title II Design. In addition, the TEC and schedule reflect completion of the West End Modification Title I Design.

[f]Reflects work scope changes necessary to address radiological contamination control and facility throughput issues.

[g]Reflects Congressional FY03 rescission of $13,000 and FY04 rescission of $108,000.

[h]Reflects updated project completion date based on further definition of the design changes needed to address radiological contamination and facility throughput issues.

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Design/Construction			
1990	3,546	3,546	1,564
1991	4,000	4,000	3,129
1992	15,000	15,000	4,238
1993	13,600	13,600	10,078
1994	0	0	2,410
1995	0	0	555
1996	3,000	3,000	7,557
1997	8,000	8,000	13,908
1998	3,100	3,100	5,559
1999	5,800	5,800	2,825
2000	12,000	12,000	11,661
2001	15,965	15,965	8,064
2002	4,200	4,200	942
2003	1,987	1,987	1,297
2004	18,192	18,192	4,785
2005	989	989	11,097
2006	0	0	14,162
2007	0	0	5,548

3. Project Description, Justification and Scope

When all phases are completed, the Expended Core Facility (ECF) Dry Cell Project will consist of shielded fuel handling, dry storage loading facilities, an area for overpack assembly, an interim storage pad, and two dry storage container loading stations.

Two independent basket-loading areas will be installed in the ECF water pits. Features of the loading facility include the water pit to dry cell delivery system, a shielded basket transfer system, two basket loading stations and two prepared fuel loading stations. The revised systems will use proven fuel handling practices that are consistent with those used throughout the Naval Reactors Program. The complete facility will have a design life of at least 40 years.

The Dry Cell Project consists of three separate tasks: the Dry Cell, the East End Modification, and the West End Modification. The Dry Cell task provides work areas and equipment needed to more efficiently handle expended nuclear cores. This task is being modified due to concerns for the ability to repair the highly radiologically contaminated in-cell equipment, lack of redundancy in the process and the resulting impact on throughput. Spent Naval Nuclear Fuel will be loaded into Spent Fuel Canister (SFC) baskets in the ECF water pits. Two basket-loading areas will be installed in the ECF water pits. Loaded baskets will be transferred in a shielded basket transfer container to one of two prepared fuel loading stations and loaded into a SFC.

The East End Modification task provides facilities and equipment for loading dry storage containers. An interim storage pad will be provided for in-process handling, staging, and interim storage of Naval spent nuclear fuel. An area for assembly of overpacks will be constructed adjacent to the interim storage pad. The overpack assembly area and interim storage pad will add an additional 35,000 square foot structure separate from the existing ECF building. This task is approximately 61 percent[a] complete.

The West End Modification task is for the design and fabrication of the equipment and facilities for the second prepared fuel-loading station, and for receiving fuel returned from INTEC that will also be loaded into SFCs. The West End Modification will provide sufficient crane capacity and rail shipping capability to allow future loading of the SFC Shipping Cask for shipment to a permanent repository. The West End Modification task will result in an approximately 21,000 square foot addition to the existing ECF building. This task is approximately 24 percent complete.

A two loading station arrangement will allow processing fuel returned from INTEC in the West End Loading Station while concurrently processing spent fuel received directly from the fleet for dry storage in the east loading station. The increased capacity of the overall Dry Cell will facilitate a more rapid return of spent fuel from INTEC. In addition, the arrangement allows future packaging of special case waste through one of the loading stations without interruption of dry storage container loading.

An independent review of the final design identified potential adverse fuel handling and throughput issues. The review team found that while the planned process which included dry processing and dry storage lines is viable, concerns arose regarding sustaining the long-term spent fuel throughput needed to meet the court-enforceable obligation to move all spent fuel from wet storage to dry storage by 2023. This throughput concern is driven by potential single point failures and radiological vulnerabilities that would be extremely difficult to overcome. The project is being modified to incorporate shielded fuel handling and a new dry storage overpack loading station. These improvements will increase fuel handling capability, facility accessibility from a radiological viewpoint, equipment maintenance, and will ensure the Program can meet the required throughput over the next two decades.

The project is scheduled to complete in February 2007. Through FY 2003, 67% of the project is completed.

[a] Adjusted from 96 percent based additional funds received in FY03 to accommodate work scope changes indicated in section 1.

4. Details of Cost Estimate[a]

	(dollars in thousands) Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design cost ($5,663,000 for Design Drawings and Specification)	15,387	15,387
Design Management costs (2.8 % of TEC)	3,059	3,059
Project Management costs (2.7 % of TEC)	2,945	2,850
Total, Engineering design, inspection, and administration of construction costs (19.5% of TEC)	21,391	21,296
Construction Phase		
Buildings	54,906	43,014
Special Equipment	11,883	19,926
Standard Equipment	5,727	5,727
Inspection, design and project liaison, testing, checkout, and acceptance	9,232	9,232
Project Management (3.1% of TEC)	3,432	2,850
Total, Construction Costs	85,180	80,749
Contingencies		
Design Phase (0.5% of TEC)	559	1,491
Construction Phase (2.1% of TEC)	2,249	5,964
Total, Contingencies (2.7% of TEC)	2,808	7,455
Total, Line Item Costs (TEC)	109,379	109,500

The cost estimate is based on the Dry Cell task being complete, the East End Modification task Title II design being complete and the West End Modification task Title II design being complete.

5. Method of Performance

Contracting arrangements are as follows:

a. Construction design will be performed under an Engineering Services Subcontract. Equipment will be designed by the prime contractors.

b. Construction and procurement will be accomplished by fixed price contracts awarded on the basis of competitive bidding.

[a] The annual escalation rates assumed for FY 2004, FY 2005, FY 2006 and FY 2007 are 2.5%, 2.9%, 2.8% and 2.6%, respectively.

c. Title III Support: By Engineering Services Subcontractor under operating contractor surveillance.

6. Schedule of Project Funding

	Prior Years	FY 2003	FY 2004	FY 2005	Outyears	Total
Project Costs						
Facility Costs						
Design	19,196	438	1,158	1,158	0	21,950
Construction	53,294	859	3,627	9,939	19,710	87,429
Total, Line Item TEC	72,490	1,297	4,785	11,097	19,710	109,379
Operating expense funded equipment[a]	4,351	0	0	0	0	4,351
Total Facility Costs	76,841	1,297	4,785	11,097	19,710	113,730
Other Project Costs						
Conceptual Design Cost	1,601	175	0	0	0	1,776
Decontamination & Decommissioning[b]	1,184	0	0	0	0	1,184
NEPA Documentation Costs	2,500	0	0	0	0	2,500
Other project-related costs[c]	1,286	50	50	100	150	1,636
Total, Other Project Costs	6,571	225	50	100	150	7,096
Total Project Cost (TPC)	83,412	1,522	4,835	11,197	19,860	120,826

[a] Includes costs for adaptation of existing storage overpacks for the selected Naval Spent Fuel Canisters (NSFCs); development of container welding systems; and procurement of weld mockups and two sets of NSFCs and overpacks for facility and system testing and checkout. Prior Years figures include costs of $50,000 and $100,000 respectively for the design and fabrication of the temporary west shield wall.

[b] Prior Years figures include costs for removal of the spray pond and Butler Buildings 10 and 10A.

[c] Includes costs for procurement of several prototype items to support equipment design and confirm system operations, for facility startup, and for operator training.

7. Related Annual Funding Requirements

	(dollars in thousands) Current Estimate	Previous Estimate
Annual facility operating costs[a] …………………………………………………	4,506	4,506
Annual facility maintenance and repair costs ……………………………………	0	0
Programmatic operating expenses directly related to the facility ……………	0	0
Utility costs[b] ………………………………………………………………………	574	574
Total related annual funding…………………………………………………………	5,080	5,080
Total operating costs (operating FY2002 through FY2042) ………………………	203,200	203,200

a Includes personnel, materials, and capital equipment costs for operation, maintenance, and repair.

[b] Includes electrical power, steam heat, and maintenance items such as utility lines, valves, and pumps.

Site Funding Summary

	($ in Thousands)		
	FY 2003 Comparable	FY 2004 Comparable	FY 2005 Request
Ames Laboratory	180	250	250
Argonne National Laboratory	24,727	19,153	22,411
Atomic Energy of Canada Ltd	2,360	1,215	1,215
Bettis Atomic Power Laboratory	351,600	396,234	401,150
Brookhaven National Laboratory	25,446	44,537	34,911
Chicago Operations Office	207,893	426,631	469,745
General Atomics	10,809	11,034	13,255
Headquarters	501,289	688,233	771,103
Idaho National Engineering Laboratory	59,517	58,024	57,981
Idaho Operations Office	1,436	1,130	1,426
Kansas City Plant	390,330	403,834	379,461
Kansas City Site Office	6,201	6,59	6,012
Knolls Atomic Power Laboratory	269,500	282,028	308,250
Lawrence Berkley National Laboratory	5,179	4,037	4,091
Lawrence Livermore National Laboratory	1,048,657	1,004,123	1,033,658
Livermore Site Office	12,844	16,072	16,489
Los Alamos National Laboratory	1,409,994	1,415,577	1,519,169
Los Alamos Site Office	11,964	14,558	15,865
NNSA Service Center	487,968	467,215	414,408
National Engineering Technology Laboratory	1,674	0	0
National Renewable Energy Laboratory	1,681	1,747	1,759
Naval Research Laboratory	22,327	13,317	11,049
Nevada Test Site	274,688	285,419	283,929
Nevada Site Office	104,087	92,500	70,572
New Brunswick Laboratory	1,477	1,083	1,135
ORISE	7,783	8,821	7,134
OSTI	145	135	134
Oak Ridge National Laboratory	110,646	95,758	144,372
Oak Ridge Operations	3,086	4,000	5,940
Pacific Northwest National Laboratory	132,491	85,564	74,535
Pantex Plant	412,996	431,119	473,768
Pantex Site Office	9,944	10,768	11,591
Pittsburgh Naval Reactors Office	7,755	8,231	8,748
Richland Operations Office	716	820	1347
Rocky Flats Office	800	0	0
Sandia National Laboratories	1,306,814	1,376,657	1,312,010
Sandia Site Office	8,635	12,056	12,518
Savannah River Operations Office	13,994	26,549	32,384
Savannah River Site	305,289	303,322	294,446
Savannah River Site Office	3,548	3,148	2,925
Schenectady Naval Reactors Office	6,330	6,712	7,002
University of Rochester/LLE	46,762	62,618	45,469
Y-12 National Security Complex	734,311	728,184	787,963
Y-12 Site Office	9,641	16,349	11,674
Adjustments	-143,499	-176,184	-30,000
TOTAL, NNSA	**8,216,900**	**8,665,801**	**9,048,700**

BETTIS ATOMIC POWER LABORATORY

INTRODUCTION:

Bettis Laboratory is a research and development laboratory operated by Bechtel Bettis, Inc., for the Naval Nuclear Propulsion Program, a joint Department of the Navy-Department of Energy (DOE) organization. The Pittsburgh Naval Reactors Office oversees Bettis operations. Bettis is primarily involved with the design, development, and operational follow of nuclear propulsion plants for naval vessels. The Program ensures the safe operation of reactor plants in nuclear-powered submarines and aircraft carriers (constituting 40 percent of the Navy's combatants), and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements. The initial efforts of Bettis Laboratory led to the development of the power plant for USS NAUTILUS (SSN 571), the world's first nuclear-powered submarine. The Bettis Atomic Power Laboratory is situated on nearly 202 acres of the former Bettis Airfield in West Mifflin, Pennsylvania, about 7.5 miles southeast of Pittsburgh, Pennsylvania.

HISTORY:

On December 10, 1948, the Atomic Energy Commission (AEC) awarded a contract to Westinghouse Atomic Power Division to design and develop a prototype nuclear power plant for submarine propulsion. Under this contract, the AEC agreed to furnish funds for the construction of a Government-owned/contractor-operated research and development laboratory. Westinghouse purchased the Bettis Airport on January 27, 1949, as the site for its newly formed Atomic Power Division to work on that contract. Bechtel National, Inc., replaced Westinghouse Electric Corporation as the operating contractor on February 1, 1999.

Since USS NAUTILUS, Bettis has worked on many aspects of the development of the nuclear navy. Advanced technology for submarine and surface ship nuclear propulsion plants has constituted a major portion of the work program. Bettis's work on the prototype nuclear propulsion plant for a surface ship, and successful operation of the prototype at the Naval Reactors Facility in Idaho Falls, Idaho, led to the development of the first nuclear-powered surface ship, the cruiser USS LONG BEACH (CGN 9), and the first nuclear-powered aircraft carrier, USS ENTERPRISE (CVN 65). Bettis currently provides design and engineering support for many of the Navy's operating propulsion plants, (including the propulsion plants in the NIMITZ-class aircraft carriers and in the new SEAWOLF-class attack submarines), and is developing new technologies and designs for the Navy's future ships, such as the VIRGINIA-class submarines and the CVN 21-class aircraft carriers.

Bettis has also played a role in developing land-based nuclear reactor plants. Under Naval Reactors, Bettis worked on the design and development of the first United States full-scale nuclear power plant for civilian use, the Shippingport Atomic Power Station. Shippingport was also the site of the first Light Water Breeder Reactor, which operated from 1977 to October 1982. This advanced reactor system was developed to enhance the use of fuel in light water reactors. The technology developed for the Shippingport program has been made available to Industry for commercial application.

In addition, Bettis has lead responsibility for the overall program for training Navy personnel in nuclear plant operations, including training at the Naval Nuclear Power Training Command, Charleston, South Carolina; the Moored Training Ships; and Fleet training. Bettis also maintains engineering field offices at numerous shipyards and core contractor facilities and operates the Expended Core Facility at the Naval Reactors Facility near Idaho Falls, Idaho.

The broad spectrum of Bettis' activities has included work on core and component technology and design, thermal and hydraulic systems, materials, and nuclear physics.

MANAGEMENT:

NNSA Management:

Pittsburgh Naval Reactors Office

Management and Operation Contractor:

Bechtel Bettis, Inc. was awarded a new 5-year contract for the management and operation of the laboratory. This contract began on February 1, 1999 and has the option to extend the contract for another 5 years.

(dollars in millions)

Bettis Funding	FY 2003	FY 2004	FY 2005
Naval Reactors Development			
Operating Expenses	342.6	377.7	400.2
Major Construction Projects	9.0	18.5	1.0
Total, Bettis	351.6	396.2	401.2

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY

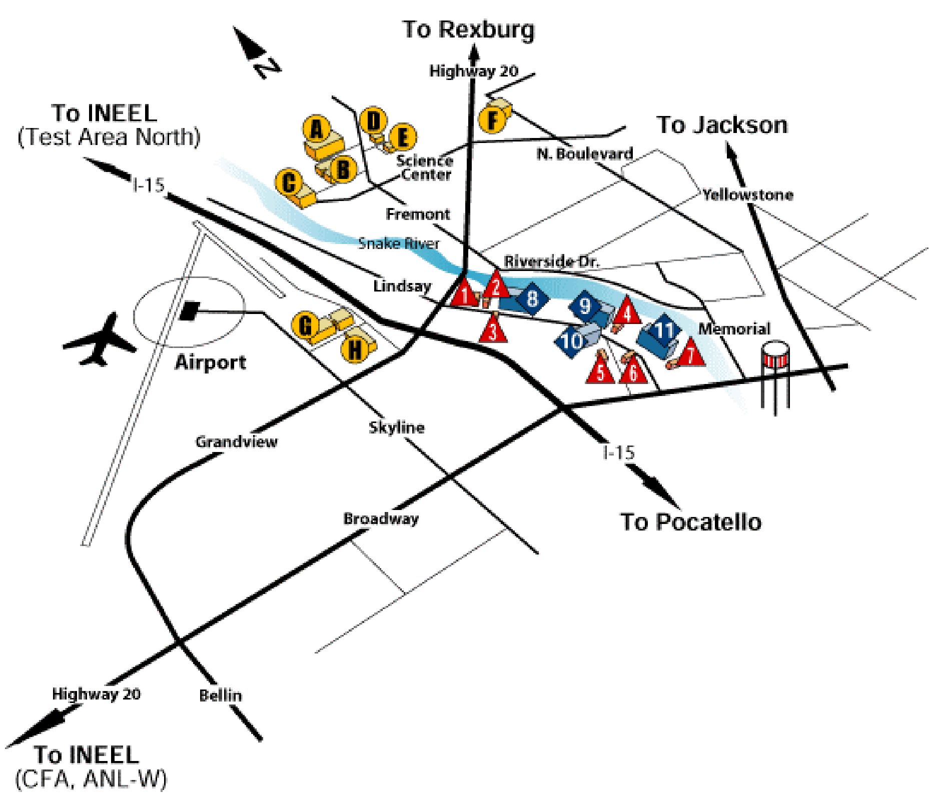
INTRODUCTION:

The Idaho National Engineering and Environmental Laboratory (INEEL), located in Eastern Idaho, consists of an 890-square mile reservation located 32 miles west of Idaho Falls, Idaho. Research facilities and office buildings are also located in Idaho Falls. The Laboratory employs about 8,000 people at these two locations.

HISTORY:

Background. Established in 1949 as the National Reactor Testing Station, the INEEL was once the site of the world's largest concentration of nuclear reactors. Fifty-two test reactors - most of them first-of-a-kind - were built and operated, including the Navy's first prototype nuclear propulsion plant. Of these, three are still operating. The Advanced Test Reactor at the INEEL Test Reactor Area is used for materials testing and the production of medical and industrial isotopes. The other two operations reactors are the Advanced Test Reactor Criticality Facility, which is a full-scale, low-power version of the Advanced Test Reactor designed to provide physics data, and the Neutron Radiography Reactor at Argonne National Laboratory-West (located at INEEL).

In 1951, the INEEL achieved one of the most significant scientific accomplishments of the century - the first use of nuclear fission to produce a usable quantity of electricity. This occurred at the Experimental Breeder Reactor No. 1. EBR-I is now a Registered National Historic Landmark open to the public.



MANAGEMENT:

NNSA Management:

The University of Chicago operates Argonne National Laboratory West and reports to DOE's Chicago Operations Office. Bechtel Bettis, Inc. operates the Naval Reactors Facility that reports to DOE's Pittsburgh Naval Operations Office.

Management and Operation Contractor:

The INEEL is operated for the DOE by Bechtel BWXT Idaho, LLC. Members of the LLC are Bechtel National, Inc., BWX Technologies Co and INRA. INRA is a consortium of eight regional universities, each of which brings unique educational, management, research and scientific assets into collaboration and partnership with the INEEL. The DOE field office is the Idaho Operations Office.

FUNDING:

The Environmental Management Program funds slightly over 70% of the work at the INEEL. This includes Waste Management, Environmental Restoration, Spent Nuclear Fuel, High-Level Waste, INTEC, and Validation and Verification. The remaining funding sources consist of Work for Others (WFO), offices of Nuclear Energy, Energy Efficiency and Renewable Energy, Fossil Energy, Office of Science, Nonproliferation and National Security.

(dollars in millions)

INEEL Funding	FY 2003	FY 2004	FY 2005
Weapons Activities	1.8	2.0	
Defense Nuclear Nonproliferation................................	2.9	1.7	2.0
Naval Reactors Development O&M			
Advance Test Reactor	54.9	54.4	56.0
Total, NNSA	59.6	58.1	58.0

Defense Nuclear Nonproliferation (DNN)

The Idaho National Engineering and Environmental Laboratory supports four DNN programs: Nonproliferation & Verification Research and Development (R&D) for development of counter nuclear smuggling detection technologies using accelerator systems for U.S. International Border; Nonproliferation and International Security providing technical support for export control activities; International Materials Protection and Cooperation safety and vulnerability analysis activities; and Russian Transition Initiatives to provide technical support for the Initiatives for Proliferation Prevention program and export control activities.

Naval Reactors Development

The Advanced Test Reactor (ATR) is the product of an evolution in nuclear test reactors. Located at the Test Reactor Area at the Idaho National Engineering and Environmental Laboratory, the ATR was originally commissioned in 1967 with the primary mission of materials and fuels testing for the Naval Reactors Program. It is the highest power research reactor operating in the United States. Its large test volumes make it attractive for irradiations of materials and components. Though it has been operating for many years, the ATR is expected to remain operational until at least the year 2050.

The ATR is designed to evaluate the effects of intense radiation on material samples, especially nuclear fuels. The principal customer for the reactor over most of its lifetime has been Naval Reactors. Other uses include isotope production for medical, industrial, environmental, agricultural and research applications. The ATR has provided a large fraction of the Ir-192 used in U.S. commercial radiography sources and high specific activity Co-60 for medical applications. Irradiation services are provided for government programs as well as private firms and consortiums.

The ATR produces very high neutron flux, which allows the effects of many years of operation in other reactor environments to be simulated in as short as one-tenth the time. Subsequent evaluations of test specimens in the Naval Reactors Expended Core Facility and the Knolls Atomic Power Laboratory Radioactive Materials Laboratory facilities are the main source of data on the performance of reactor fuel, poison, and structural materials under irradiated conditions.

One of the advantages of the ATR is the precision with which the power level (or neutron flux) can be adjusted at the various test positions. An individual test train's internal arrangement and location in the ATR determines exposure to specific conditions. Naval Reactors continues to develop enhanced systems for high temperature irradiation testing with precise temperature control and environmental monitoring in the ATR.

(dollars in millions)

ATR Funding	FY 2003	FY 2004	FY 2005
Operations	52.7	54.0	54.0
Facilities	2.2	0.7	8.4
Total, ATR	54.90	54.70	62.40

Advanced Test Reactor

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(dollars in millions)

ATR Funding	FY 2003	FY 2004	FY 2005
Operations	52.7	53.7	55.2
Facilities	2.2	0.7	0.8
Total, ATR	54.9	54.4	56.0

KANSAS CITY PLANT

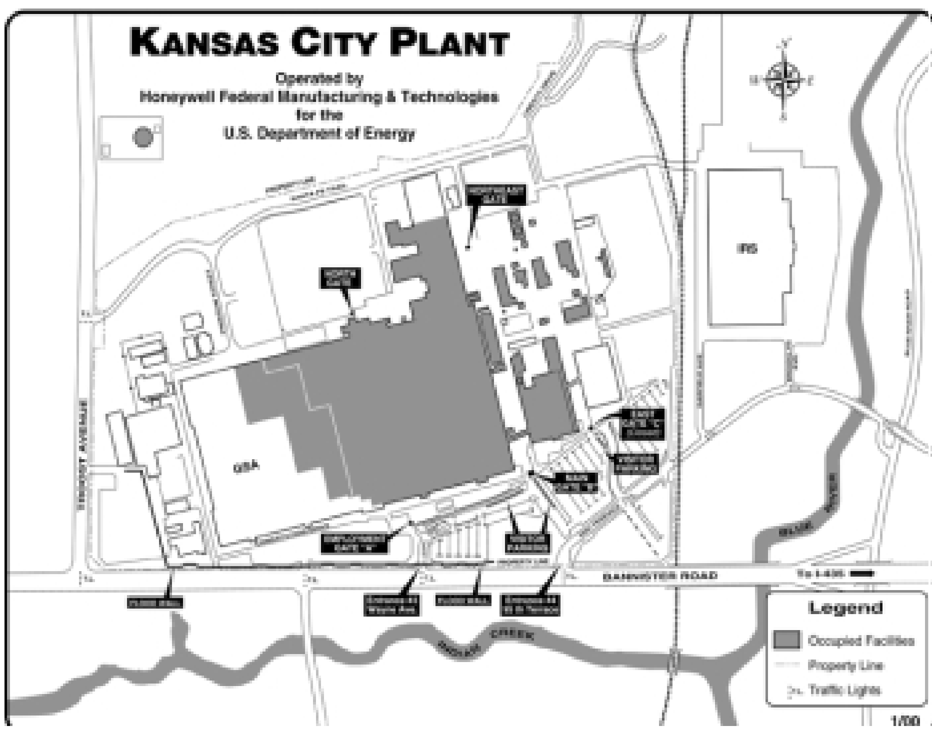
INTRODUCTION:

The Kansas City Plant (KCP) is situated on approximately 122 acres of the 300-acre Bannister Federal Complex located within city limits, 12 miles south of downtown Kansas City, Missouri.

HISTORY:

The Navy constructed the original plant, in 1941, to produce aircraft engines. In 1948, the Atomic Energy Commission obtained a significant portion of the war surplus plant, and selected the Bendix Corporation to produce electrical and mechanical components for nuclear weapons. Bendix managed the plant until 1982, when it was merged with Allied Signal. In 1999, Allied Signal merged with the Honeywell Corporation and renamed the new company Honeywell International. The Honeywell Federal Manufacturing and Technologies Division manages and operates (M&O) the KCP for the National Nuclear Security Administration (NNSA).

The current and future missions are consistent with the Record of Decision for the Stockpile Stewardship and Management Preliminary Environment Impact Statement, December 19, 1996.



MANAGEMENT:

National Nuclear Security Administration Management:

Kansas City Site Office

Management and Operating Contractor:

Honeywell was awarded a new 5-year contract for the management and operation of the plant. This contract began January 1, 2001 and has a value of $1.7 billion over 5 years. After the contract period, DOE has the option to extend the contract for another 5 years.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	175.0	181.0	180.4
Engineering Campaign	6.3	9.3	9.1
Inertial Confinement Fusion Ignition and High Yield Campaign	1.3	0	0
Advanced Simulation and Computing	.5	0	0
Readiness Campaign	33..2	45.9	47.6
Readiness in Technical Base and Facilities	138.2	136.1	107.2
Safeguards and Security	18.7	14.0	17.3
Facilities and Infrastructure Recapitalization Program	12.1	14.0	17.4
Nonproliferation and International Security	.6	.5	.7
Russian Transition Initiatives	.7	.7	.7
Total NNSA	390.3	403.8	379.4

Contractor Employment (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	2,907	2,912	2,865
Other	178	188	255
Total Facility	3,060	3,100	3,120

Congressional Items of Interest

- $5M for Readiness in Technical Base and Facilities to address pension liability issues.

ACTIVITIES:
WEAPONS ACTIVITIES

Directed Stockpile Work (DSW)

FY 2005 activities include preproduction engineering, tooling, and material procurement associated with the W76 and W80 Life Extension Programs (LEPs), and production associated with the B61 Alteration (Alt) 357 LEP First Production Unit (FPU). Enduring Stockpile System production activities include Firing Set, Environmental Sensing Devices, Lightening Arrestor Connector, and Aft Subassembly surveillance rebuilds in addition to lab and flight test sampling. Major reservoir production continues for the W76, B61, and W80 Enduring Stockpile Systems, and reservoir development activities include the W78 and W88 Systems.

Engineering Campaign
In FY 2005, KCP has a primary role in the development of new flight instrumentation techniques that enable the acquisition of detailed information regarding structure and performance of weapons at the highest possible environmental and configuration fidelity. The FY 2005 funding supports High Explosive Radio Telemetry (HERT) III and Engineering Development Telemetry (EDTM) flight tests, and new materials and components aging studies.

Readiness Campaign
In FY 2005, the Nonnuclear Readiness funding level ($25.4M) includes the replacement of test equipment required to accept new production products in support of LEPs, and reflects implementation of as-built/design model archiving and transfer capabilities and automated feature-based manufacturing development, manufacturing, and inspection for production of W76 and W80 components.

Tritium Readiness FY 2005 activities ($3.3M) include the remainder of facility preparation including equipment procurement and installation, as well as engineering and inspection development for the two KCP assigned components of the Tritium Producing Burnable Absorber Rod assembly.

FY 2005 Advanced Design and Production Technologies activities ($18.9M) include developing stronglinks and their associated testing equipment concepts, developing cable tester and other automated inspection methods that will interpret complex data and retain digital data of the acceptance. Classified computing with more applications will be made available to the engineering desktops.

Readiness in Technical Base and Facilities
In addition to the continual support of fundamental services, key activities for FY 2005 include procurement of the $3.1 million Automated Storage and Retrieval System major item of equipment, construction of one General Plant Project (GPP) project and design of 4 GPP projects to position the KCP for future GPP construction activity. Several projects are nearing completion (Replace Boilers and Controls and Structural Upgrades) or are well underway (Stockpile Management Restructuring Initiative). The Gas Transfer Capacity Expansion project is currently in design.

Facilities and Infrastructure Recapitalization Program
Facility and Infrastructure Recapitalization Program projects are replacing and upgrading systems in essential production facilities in support of Limited Life Component production and LEPs for the W-87, B-61, W-76, and W-80 weapons programs. FIRP also has initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction. Long needed roof repairs are underway across the vast and complex roofing system covering the plants DSW activities.

Safeguards and Security
In FY 2005, the KCP will complete a two-year effort to replace aging interior alarm equipment, improve alarm system reliability and maintenance requirements, and increase alarm point capacity. The plant has developed a Design Basis Threat (DBT) Implementation Plan to address new protection requirements for the site. As part of the National Threat Level Alert System, the plant may occasionally have to implement additional compensatory security measures.

DEFENSE NUCLEAR NONPROLIFERATION

Nonproliferation and International Security (NIS)

The KCP supports NIS's commercialization efforts in the former Soviet Union.

KNOLLS ATOMIC POWER LABORATORY

INTRODUCTION:

The Knolls Atomic Power Laboratory (KAPL) is a research and development laboratory operated by KAPL, Inc. (a Lockheed Martin Company) for the Naval Nuclear Propulsion Program, a joint Department of the Navy-Department of Energy organization. The Schenectady Naval Reactors Office oversees KAPL operations. It is KAPL's sole function to support the U.S. Naval Nuclear Propulsion Program through development of advanced reactor plant designs, while providing design agency support of the operating fleet and training nuclear propulsion plant operators. The Program ensures the safe operation of reactor plants in nuclear-powered submarines and aircraft carriers (which constitute 40 percent of the Navy's combatants), and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements. The Knolls Site in Niskayuna is situated on approximately 180 acres of land, while the Kesselring Site in West Milton is situated on approximately 3,905 acres. KAPL field personnel also work at shipyards in New Hampshire, Connecticut, Virginia, Hawaii, and Washington, as well as at the Naval Reactors Facility Site in Idaho.

HISTORY:

The General Electric (GE) company originally operated KAPL. GE received its initial research contract to establish KAPL from the Manhattan Engineering District in May 1946. KAPL's mission was converted to a nuclear propulsion project in 1950. KAPL's initial efforts were spent developing a safe reactor small enough to operate inside a submarine. USS SEAWOLF (SSN 575), launched in 1955, represented the first KAPL-designed reactor plant. Subsequently, KAPL designed reactors for the USS TRITON (SSN 586), USS NARWHAL (SSN 671), the research submarine NR-1, LOS ANGELES and VIRGINIA-class attack submarines and OHIO-class ballistic missile submarine.

KAPL currently maintains, supports, and enhances the mission capability of LOS ANGELES-class submarines and OHIO-class ballistic missile submarines. KAPL also supports Electric Boat and Newport News in the test and construction of the VIRGINIA-class submarines and provides design and engineering support for the future CVN 21-class aircraft carriers.

KAPL's efforts focus on designing the world's most technologically advanced nuclear reactor plants for U.S. Navy submarines. Fundamental research is conducted to develop improved materials, chemistry control systems, and components for naval nuclear propulsion technology.

KAPL uses its theoretical knowledge, sophisticated testing capabilities, and computational power to design new reactor and propulsion systems and components that will be used on existing and future Navy surface ships and submarines. Some additional areas KAPL focuses on are direct energy conversion and advanced composite materials.

In addition, KAPL operates two prototype plants located at the Kesselring Site in West Milton, N.Y. The MARF and S8G prototypes began operating in 1976 and 1978, respectively, and are used primarily for naval nuclear propulsion training. These plants are also used to test reactors, reactor plant systems, and reactor steam and electric plant components. Also located at Kesselring, the S3G and D1G prototypes are undergoing inactivation. S3G and D1G, which started operation in 1958 and 1962, respectively, were used for training and testing until their missions were completed in the 1990s. At that time, the plants were shut down and inactivation was started as part of Naval Reactors' continuing commitment to ensure proper dismantlement and environmental remediation of formerly used facilities.

MANAGEMENT:

NNSA Management:

Schenectady Naval Reactors Office

Management and Operation Contractor:

KAPL was awarded a new 5-year contract for the management and operation of the laboratory. This contract began on July 5, 2000; KAPL has the option to extend the contract for another 5 years.

(dollars in millions)

KAPL Funding	FY 2003	FY 2004	FY 2005
Naval Reactors Development			
Operating Expenses	267.4	283.0	302.1
Major Construction Projects	2.1		6.2
Total, KAPL	269.5	282.0	308.3

Contractor Employment (End of Year)	FY 2003	FY 2004	FY 2005
Naval Reactors	5,560	5,700	5,720
Other	0	0	0
Total Facilities	5,560	5,700	5,720

LAWRENCE LIVERMORE NATIONAL LABORATORY

INTRODUCTION:

Lawrence Livermore National Laboratory (LLNL) is a national security laboratory with responsibility for ensuring the nation's nuclear weapons remain safe, secure, and reliable. LLNL is located on a one-square-mile site in Livermore, California; with a larger (10 square miles) remote explosives testing site (Site 300) situated 18 miles east of the main Livermore site.

LLNL has a primary role in the Department of Energy/National Nuclear Security Administration (NNSA) mission for assuring the safety, security and reliability of the nation's nuclear weapons stockpile and the prevention of the spread and use of nuclear weapons, as well as other weapons of mass destruction and applying technologies to address homeland security needs.

HISTORY:

Established in 1952 to augment the Nation's nuclear weapons design capability, LLNL made major advances in nuclear weapons safety and performance throughout the Cold War. To address national security needs, the Laboratory has pioneered the application of technologies ranging from high-performance computers to advanced lasers, and it has gained multiprogram responsibilities that draw on LLNL's multidisciplinary expertise.

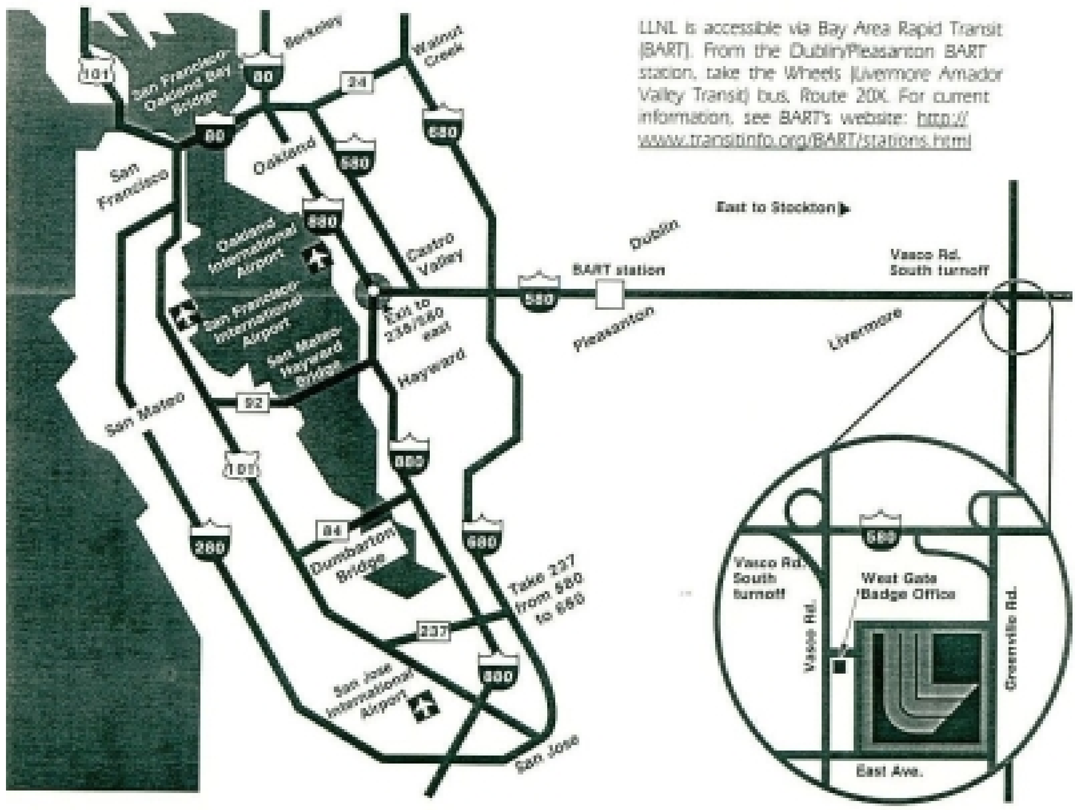
Today, LLNL's special capabilities, required for stockpile stewardship and nonproliferation activities, as well as homeland security, enable the laboratory to meet enduring national needs in conventional defense, energy, environment, biosciences, and basic science as well as enhancing the competencies needed for the national security mission.

San Francisco Airport to LLNL, Livermore
Driving Time: Approx. 1 hour
Distance: 45 miles

Oakland Airport to LLNL, Livermore
Driving Time: Approx. 45 minutes
Distance: 36 miles

San Jose Airport to LLNL, Livermore
Driving Time: Approx. 45 minutes
Distance: 36 miles

LLNL is accessible via Bay Area Rapid Transit (BART). From the Dublin/Pleasanton BART station, take the Wheels (Livermore Amador Valley Transit) bus, Route 20X. For current information, see BART's website: http://www.transitinfo.org/BART/stations.html



MANAGEMENT:

National Nuclear Security Administration Management:

Livermore Site Office

Management and Operating Contractor:

University of California. The current contract expires September 30, 2005.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	Projected FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	99.9	99.8	103.4
Science Campaign	88.2	92.5	97.8
Engineering Campaign	29.2	30.2	30.9
Inertial Confinement Fusion Ignition and High Yield Campaign	346.6	322.1	336.1
Advanced Simulation and Computing Campaign	175.3	166.9	148.7
Pit Manufacturing and Certification Campaign	4.2	10.1	17.5
Readiness Campaign	5.3	6.6	6.5
Readiness in Technical Base and Facilities	80.3	60.3	61.8
Safeguards and Security	92.9	95.1	109.6
Nuclear Weapons Incident Response	11.9	14.7	13.7
Facilities and Infrastructure Recapitalization Program	35.3	29.9	37.2
Fissile Materials Disposition	2.6	3.1	3.6
HEU Transparency Implementation	6.0	5.9	6.5
International Nuclear Materials Protection and Cooperation	21.3	27.3	17.3
Nonproliferation and International Security	11.1	9.4	10.7
Nonproliferation and Verification R&D	37.8	29.9	32.4
TOTAL NNSA	1,048.7	1,004.1	1,033.7

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	5,441	5,317	5,316
Other Department of Energy	1,405	1,413	1,414
Work For Others	1,019	1,170	1,170
Total Facility	7,865	7,900	7,900

Congressional Items of Interest

- None.

ACTIVITIES:
WEAPONS ACTIVITIES
Directed Stockpile Work (DSW)

LLNL is responsible for executing a program to refurbish the W80 Nuclear Explosive Package (NEP). Additionally, LLNL supports the production of the Mechanical Safe and Arm Devices for the W87 Life Extension Program (LEP) and the life of program build. For the W62, B83, W84 and W87, LLNL performs engineering and physics analyses, supported by component, subsystem and system tests, to certify that weapons conform to the requirements of their Military Characteristics (MC) and Stockpile-to-Target (STS).

Congress has recently approved NNSA and DoD plans to conduct a Phase 6.2/2A study for a Robust Nuclear Earth Penetrator weapon. The B83 is one of the two weapons to be considered in this study.

In FY 2005, subsystem tests and a full system test of the proposed design will be completed. Phase 6.2A will be initiated. All the appropriated 6.2/2A documentations for the LLNL designs will be published, including a draft Weapon Design and Cost Report and other project plans that detail how LLNL will manage, execute, and control the activities needed to accomplish Phase 6.3, Engineering Development, through Phase 6.6, Full Scale Production. LLNL is responsible for peer review of the B61 and W76 LEP Secondary, Primary performance, and engineering.

Science Campaign
For the Primary Assessment activity, ($21.3M in FY 2005) LLNL has responsibility for developing the tools and methodology to assess and certify, [via the Quantification of Margins and Uncertainty (QMU)] the safety, reliability and performance of the LLNL-owned stockpiles, including ongoing activities in LEP and Significant Finding Investigations (SFI). As the QMU tools and methodology developed as part of the Primary Assessment Campaign are validated they will be used in assessment work required to support DSW activities at LLNL.

Engineering Campaign
The Enhanced Surety activity at LLNL will develop nuclear explosive related technologies aimed at improving the safety of nuclear weapons in abnormal environments, ($31M in FY 2005).

Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign
The National Ignition Facility (NIF), which will contain the world's largest laser and is one of the core facilities in support of the ICF Campaign, is under construction at the site. In addition to the line item construction activities, in FY 2005, the NIF Laser Demonstration Program will continue as per the planned baseline, and continue to provide additional laser capability. The ignition activities will have a specific emphasis focused on ignition target design and fabrication technology, laser-plasma interaction investigations on NIF, and the development of experimental methods for indirect drive ignition. The support of Stockpile Stewardship Program (SSP) activities will be concentrated on providing specific data for SSP campaigns and activities, as well as developing experimental capabilities and tools to support High Energy Density Physics (HEDP) experiments. Experimental Support Technology activities will include a major emphasis on the development and delivery of ICF/HED experimental support systems, including diagnostic systems, NIF cryogenic target support systems, and fabrication of necessary optics to support experiments, as well as the development of high-energy petawatt laser technology.

Advanced Simulation and Computing (ASCI) Campaign
LLNL is delivering validated physics and engineering models, and scheduling code development to support refurbishments, significant finding resolutions, and evolving future requirements. In addition, it is providing an appropriate computing environment to meet simulation requirements of the Stockpile Stewardship Program (SSP). ASCI Purple, a collaboration of the tri-lab community led by LLNL, represents the technology for delivering a 100-TeraOPS capability to the SSP in 2005, ($145M in FY 2005). The Terascale Simulation Facility, currently under construction at LLNL, will be capable of housing the 100 TeraOps-class computers required to meet the milestones and objectives of the ASCI Campaign, ($3.2M in FY 2005).

BlueGene/L is a next-generation massively parallel computing system designed for R&D in computational science targeted at selected applications of interest to the ASCI tri-laboratory community and its University Alliance partners. A select, but broad set of science-application areas have been identified as an initial focus for execution on BlueGene/L. It is likely that BlueGene/L will undergo acceptance testing in late FY 2005, including full-system runs of Linpack. General use of the system for science calculations will commence after acceptance testing is complete.

Pit Manufacturing and Certification Campaign
LLNL's efforts provide independent technical assessments of the physics performance and engineering response using the latest legacy and ASCI codes; key enabling technologies required to build a modern pit facility including metal processing, casting, and shaping technologies; and requirements and process definitions of technologies required to build pits for LLNL systems.

Readiness Campaign
LLNL centers of excellence in design, modeling, simulation, materials processing, high explosives development, non-destructive evaluation and information technologies enable Advanced Design and Production Technologies efforts that, in turn, are of direct benefit to LEPs such as the W80, Core and Enhanced Surveillance, and evolving Advanced Concepts such as Robust Nuclear Earth Penetrator.

Readiness in Technical Base and Facilities (RTBF)
Stockpile Stewardship Mission Essential Facilities, the subset of direct, programmatic facilities and technical base (i.e. "capabilities"), that is direct-funded through the RTBF program ($54.7M in FY 2005) include the Nuclear Materials Technology Program (NMTP) facilities (Superblock), the hydrotest bunkers and engineering test facilities at Site 300, the LINAC (B194) and light gas guns (B341), the High Explosive Applications Facility (HEAF), and Managing & Operating activities at the Nevada Test Site.

Construction projects currently underway at LLNL ($6.9M in FY 2005) include: Engineering Technology Complex Upgrade, Sensitive Compartmented Information Facility, Isotope Sciences Facility, and Roof Reconstruction, Phase II (Protection of Real Property). Two projects will be initiating design at LLNL in FY 2004: Energetic Materials Processing Center and Tritium Facility Modernization.

Nuclear Weapons Incident Response
For the DOE and the Office of Emergency Response, LLNL assists in operating, exercising, and maintaining DOE's capability to provide assistance to Federal, state and local government agencies for responding to radiological accidents and incidents. LLNL deploys trained, qualified technical and professional personnel and specialized equipment and provide research and development, training, exercises, operations, maintenance and required coordination with other Federal agencies and foreign governments to effectively address current and projected threats.

Facilities and Infrastructure Recapitalization Program
Facilities and Infrastructure Recapitalization Program funded projects include replacement of failing transformers and associated electrical components in mission essential facilities; replacement/upgrades of High Efficiency Particulate Air filter housings, ductwork, Heating, Ventilation, and Air Conditioning systems and associated equipment to ensure reliability and improve worker safety in radiological facilities; replacement of aged/worn-out machine tools, equipment and supporting systems which eliminate approximately 20% downtime, improve precision/quality and permit operators to meet Stockpile Stewardship Program-mandated tolerances for nuclear weapons components. FIRP also has

initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction.

Safeguards and Security

In FY 2005, LLNL will initiate a contract to replace components of the Argus system that are or will soon be obsolete. The laboratory has developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements.

Nonproliferation and Verification Research and Development

LLNL improves geographic models to locate and identify regional seismic events to support nuclear explosion monitoring assessments. LLNL will deliver field-calibrated models of the seismic response for additional, specified regions of interest, and will demonstrate prototype tools for the automation of incorporating newly acquired data into these models. The lab develops and tests gamma and neutron detection materials for future commercial systems to search for and locate special nuclear material; and is a member of an interlaboratory team to investigate methodologies to establish a scientific basis for attribution to determine the origin of fissile materials. Serves as the interlaboratory coordinator on testing optical remote sensing techniques for Weapons of Mass Destruction proliferation detection/characterization; and is a recognized national leader in developing hyperspectral analysis methods for standoff detection of gases and other materials over denied areas.

International Nuclear Materials Protection and Cooperation (MPC&A)

LLNL provides operational experience in nuclear material protection, control and accounting in combination with institutional expertise in nuclear energy, international and domestic safeguards, and the assessment of the proliferation impacts on U.S. national security of foreign nuclear energy programs. The LLNL supports international MPC&A activities at several Russian Navy, Civilian, and MinAtom Weapons Complex sites, supports MPC&A sustainability and infrastructure projects for Ministry of Defense, MinAtom, GAN, Ministry of Transportation, and Russian Shipbuilding Agency, and supports activities for Radiological Threat Reduction Initiatives.

LOS ALAMOS NATIONAL LABORATORY

INTRODUCTION:

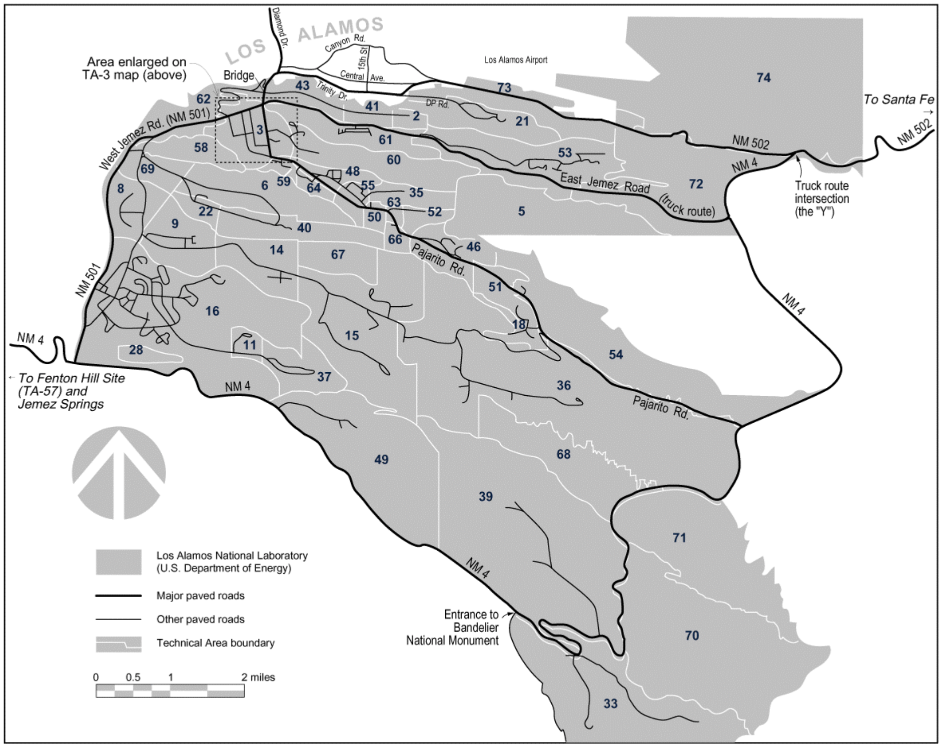
The Los Alamos National Laboratory (LANL) is located on approximately 28,000 acres, adjacent to the town of Los Alamos, New Mexico, which is approximately 25 miles northwest of Santa Fe. It was established as a nuclear weapons design laboratory in 1943, under the leadership of J. Robert Oppenheimer.

HISTORY:

LANL is a multi-program laboratory, supporting research predominantly in national security. The laboratory also supports environmental restoration, waste management, general science programs, homeland security, and work for others. The Deputy Administrator for Defense Programs is both the Cognizant Secretarial Officer, having line-management accountability for LANL, and the Lead Program Secretarial Officer, responsible for landlord activities and overall site integration and operations.

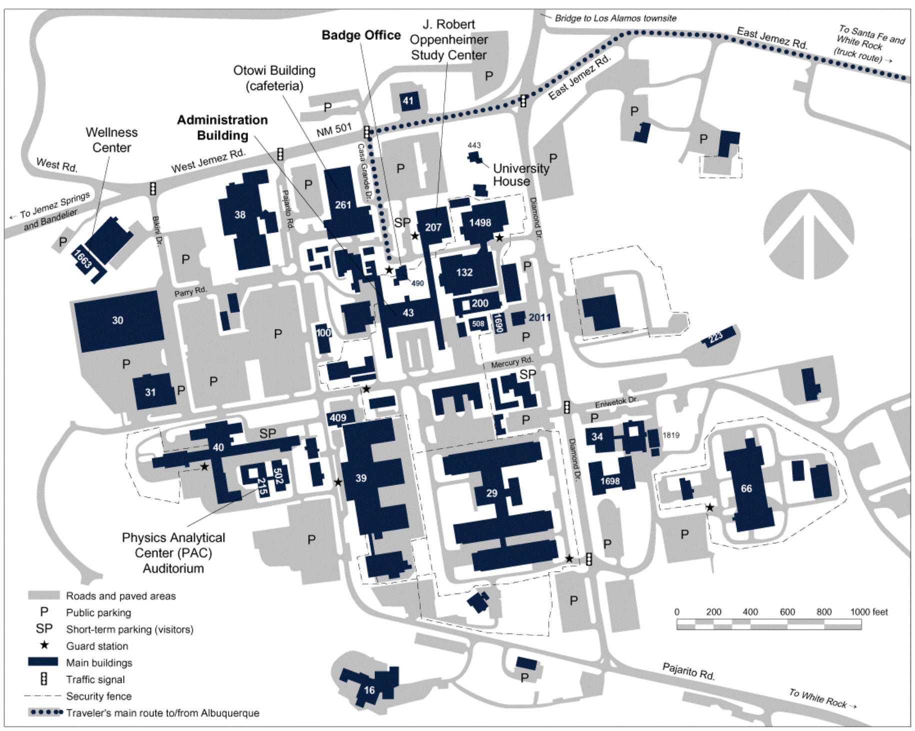
The Record of Decision for a Site-Wide Environmental Impact Statement (SWEIS) for the continued operation of LANL was published September 20, 1999. The decision allows for expanded operations, consistent with the Record of Decision for the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (EIS), issued December 19, 1996, including implementation of pit manufacturing, at the level of twenty pits per year, and expansion of the low-level radioactive waste disposal facility.

The Record of Decision, administered by Department of Energy (DOE) at Los Alamos, for the conveyance and transfer of land tracts to Los Alamos County and to the Department of Interior, in trust for the Pueblo of San Ildefonso, was published March 2000. From a total of 4,120 acres of land to be conveyed or transferred under PL 105-119, the DOE at Los Alamos has conveyed to the County of Los Alamos or transferred to the Department of the Interior, in trust for the Pueblo of San Ildefonso, 2,210 acres of land. The end of FY 2004 will see a transfer of another 720 acres, and 110 acres will be transferred in FY 2005. At this point, the project will be 75% complete.



Technical Areas

TA	Nomenclature
2	Omega Site
3	South Mesa Site
5	Beta Site
6	Two-Mile Mesa South Site
8	Anchor West Site
9	Anchor East Site
11	K-Site
14	Q-Site
15	R-Site
16	S-Site
18	Pajarito Laboratory
21	DP-Site
22	TD-Site
28	Magazine Area A
33	HP-Site
35	Ten Site
36	Kappa Site
37	Magazine Area C
39	Ancho Canyon Site
40	DF-Site
41	W-Site
43	Health Research Laboratory/ DOE Headquarters
46	WA-Site
48	Radiochemistry Site
49	Frijoles Mesa Site
50	Waste Management Site
51	Environmental Research Site
52	Reactor Development Site
53	Los Alamos Neutron Science Center
54	Waste Disposal Site
55	Plutonium Facility
57	Fenton Hill Site
58	Two-Mile Mesa North Site
59	OH-Site
60	Sigma Mesa Site
61	East Jemez Site
62	Northwest Site
63	Pajarito Service Site
64	Central Guard Site
66	Central Technical Support Site
67	Pajarito Mesa Site
68	Water Canyon Site
69	Anchor North Site
71	Southeast Site
72	East Entry Site
73	Airport Site
74	Otowi Site



Technical Area 3 (TA-3)

SM	Building Directory
43	Administration
2011	Advanced Computer Laboratory
490	Badge Office
261	Otowi Building (Cafeteria)
31	Chemical Warehouse
29	CMR Laboratory
1690	CNLS Technical Research Building
508	Computational Physics Building
132	Computer Building
34	Cryogenics Building "B"
1819	Experimental Materials Science Laboratory
41	Fire Station No. 1
30	General Warehouse
207	J. Robert Oppenheimer Study Cent
38	Johnson Controls, Inc. Facilities
1498	Laboratory Data Communications Center
1698	Materials Science Laboratory
409	Occupational Medical Facility
215	Physics Analytical Center
40	Physics Building
100	Public Affairs Office
39	Technical Shops
66	Sigma Building
502	Space Science Laboratory
443	University House
223	Utilities Control Center
16	Ion Beam Facility
1663	Wellness Center

MANAGEMENT:

National Nuclear Security Administration Management:

Los Alamos Site Office

Management and Operating Contractor:

University of California. The current contract will be competed in September 2005.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING Operating and Management	Projected FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	218.1	206.8	210.9
Science Campaign	77.1	62.7	93.2
Engineering Campaign.......................................	19.7	24.4	29.1
Inertial Confinement Fusion Ignition and High Yield Campaign...	27.4	28.9	32.2
Advanced Simulation and Computing Campaign	160.1	144.4	153.2
Pit Manufacturing and Certification Campaign.....	208.6	217.1	220.8
Readiness Campaign...	11.8	8.9	9.6
Readiness in Technical Base and Facilities.........	348.5	402.3	412.4
Emergency Operations (NWIR)	7.6	8.6	8.8
Safeguards and Security....................................	126.5	120.7	168.3
Facilities and Infrastructure Recapitalization Program	41.1	45.5	56.7
International Nuclear Materials Protection and Cooperation	17.9	20.5	12.3
Nonproliferation and Verification R&D	78.6	66.8	75.1
Russian Transition Initiatives	5.0	5.0	5.1
HEU Transparency Implementation....................	1.6	2.1	2.3
Fissile Materials Disposition	42.0	34.5	8.6
Nonproliferation and International Security..........	16.0	14.3	14.3
TOTAL NNSA...	1,409.9	1,415.6	1,519.2

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	6,118	6,069	5,739
Other Department of Energy	966	907	913
Work For Others..	1,304	1,388	1,305
Total Facility	8,388	8,364	7,957

Congressional Items of Interest

- $10M for RTBF Operations of Facilities.

ACTIVITIES:

WEAPONS ACTIVITIES

Directed Stockpile Work (DSW)

Los Alamos will support the B61 Life Extension Program (LEP) by working on the Canned Subassembly (CSA) of the physics package and associated seals, foams, pads and cabling. Los Alamos will support the W76 LEP, which is in Phase 6.3 by completing engineering development of W76-1 Nuclear Explosive Package and Gas Transfer System; in FY 2005, Los Alamos will continue to assist in the transfer of information and Acorn development as outlined in the tri-laboratory agreement. LANL activities support multiple systems. In this area, LANL will warrantee the safety and surety on our nuclear weapons, execute hydrotesting, ensure weapons archiving, perform studies of the nuclear weapons stockpile, perform models-based engineering and manufacturing, and provide the core competencies and capabilities for the gas transfer systems.

Science Campaign

Within the Primary Assessment Technology activity, one of LANL's principal goals is the development and application of analysis techniques, including Quantitative Margins and Uncertainties (QMU), that supports baseline model improvement. LANL will support Dynamic Materials Properties ($28M in FY 2005) largely through use of its specific experimental capabilities to provide data for, and tests of, predictive models of material properties and behavior. The goal in Advanced Radiography ($29M in FY 2005) is to assess and develop the capability to deduce, from radiography, the integral performance of a nuclear weapon during the primary implosion phase in order to assure the continuing reliability and safety of the stockpile. This will be accomplished by translating stockpile certification requirements into quantitative time-dependent, three-dimensional radiographic requirements, assessing current and future technologies, and developing and integrating the required capabilities for quantitative linkage to weapons performance. This area also provides for the initial optimization of the Dual-Axis Radiographic Hydrotest (DARHT) second axis and the continued evolution of DARHT over the next decade. LANL will continue to advance proton radiography capabilities and apply them to stockpile problems using the pRAD facility at the Los Alamos Neutron Science Center (LANSCE).

Within Secondary Assessment Technology LANL ($20M in FY 2005) will identify the key elements of the functional sequence of events leading to secondary explosion, and work to resolve key issues in each element to the accuracy consistent with the overall allowable uncertainty for the weapon systems in the stockpile.

Engineering Campaign

This includes efforts to develop improved surety options, such as a new level of use-control capabilities that may be considered for incorporation in scheduled stockpile refurbishments. In addition, LANL has established science-based engineering methods to increase confidence in weapons systems through validated simulation models and high-fidelity experimental tests.

Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign:
The LANL ICF effort ($32M in FY 2005) provides quantitative experimental data and physical underpinning needed for validation of advanced modeling required in nuclear weapons certification. We participate in the pursuit of laboratory ignition by utilizing unique Los Alamos scientific and technological capabilities. This area includes the work necessary to establish the fundamental science and technology base to produce National Ignition Facility (NIF)-specification ignition capsules.

Advanced Simulation and Computing (ASCI) Campaign
Los Alamos will complete two-dimensional modern baselines for all systems in the stockpile during FY 2005 and will use those baselines in DSW and in making predictions for DynEx experiments, provide the computational tools and infrastructure used in analysis resources, improved software quality will provide data that will be used to validate ASCI models and codes.

Pit Manufacturing and Certification Campaign
The strategy of the campaign includes reestablishment of the technical capability to manufacture war reserve (WR) pits, the establishment of a manufacturing capacity required to support the nuclear weapons stockpile, and the ability to certify newly manufactured pits for entry into the stockpile without the use of nuclear testing. The near-term activity is focused on W88 pit manufacturing and certification, and long-term activities include demonstrating the capability to manufacture all pits in the enduring stockpile as well as plan for long term pit manufacturing capacity.

Readiness Campaign
At Los Alamos, two Readiness activities are performed: Advanced Design and Production Technologies (ADAPT) and Nonnuclear Readiness. Los Alamos's ADAPT activities ($7M in FY 2005) reflect both design and production technology development--both major activities at Los Alamos. The scope of work includes all LANL production activities, plus supporting capabilities such as secure networking and certain technical business practices. Activities are principally organized according to the product(s) they are intended to support (e.g., Detonators, Tritium/Neutron Target Tube Loading, Beryllium Components, Pits, Mock Pits, and Experimental Hardware), as well as development of Models-Based Engineering tools and capabilities and a manufacturing capability for neutron tube target loading. Los Alamos also has a significant Non-nuclear production activity in developing capabilities for Los Alamos non-nuclear production as well as other plants. Scope includes deployment of processes, capabilities, and infrastructure required to meet directive schedule requirements for production and surveillance of non-nuclear components. Activities at LANL support detonator manufacturing and surveillance, neutron tube target loading, surveillance, and portions of the beryllium technology mission.

Readiness in Technical Base and Facilities (RTBF)
The RTBF activities include operating and maintaining Defense Programs-owned facilities in "warm standby" mode, including the Engineering, Tritium, Dynamic Experimentation, LANSCE, Waste Management, Nuclear Materials Technology [e.g., TA-55 & Chemistry and Metallurgy Research (CMR)], Beryllium Technology, and Nuclear Materials Storage and Critical Experiments Facility (e.g., TA-18). Warm standby work scope includes conventional facility management, infrastructure and utilities, and operation & maintenance of special equipment, ($319M in FY 2005).

Construction ($77M in FY 2005) projects currently in conceptual design at LANL include the TA-18 relocation project and CMR Replacement project. Design will be initiated on the Dynamic Experimentation High Explosives Characterization project in FY 2005.

Facilities and Infrastructure Recapitalization Program

The Facilities and Infrastructure Recapitalization Program (FIRP) is funding a balanced program of deferred maintenance reduction and an aggressive facility disposition program to eliminate excess facilities. FIRP funded projects have provided both direct and indirect support to the Stockpile Stewardship Program by providing quality work space that promotes worker productivity, professional interaction and retention and recruitment of the personnel needed to carry out the Laboratory's this mission. In addition, FIRP funded projects have supported upgrades and recapitalization of the infrastructure in core mission facilities. This includes the modernization of 50-year old laboratories, replacement of mechanical equipment and the repair of electrical systems. The Power Grid Infrastructure System line item construction project will be initiated in FY 2005 ($10M) to build a third power line and eliminate the single point of failure on site. FIRP also has initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction.

Safeguards and Security

Nuclear Materials Safeguards and Security Upgrades, Phase I, is underway at LANL. Two new security line item construction projects are proposed for design or design-build in FY 2005: Nuclear Materials Safeguards and Security Upgrades, Phase II ($10M in FY 2005) and the Security Perimeter Project ($20M in FY 2005). The laboratory has developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements.

DEFENSE NUCLEAR NONPROLIFERATION

Nonproliferation and Verification Research and Development

LANL provides the U.S. Government with improved analytic tools and sensors to discriminate earthquakes and industrial activities from banned nuclear explosions. LANL begins delivering next generation of satellite based electromagnetic pulse sensors and continues developing next generation radiation sensors for nuclear explosion monitoring systems. The laboratory will develop expert unattended methods and handheld radiation detection systems to support monitoring operations for compliance to future nonproliferation policies. LANL will continue developing innovative algorithms and specialized processors to process voluminous quantities of remote sensing data into the specific information required by decision makers. The world-class radiometric calibration facility and expertise developed at LANL, as part of the multi-spectral thermal imaging small satellite program, will be used in ongoing data analysis from the satellite which is now in orbit as well as for other spectral programs. The lab develops analysis capability from the Fast On-Orbit Recording of Transient Events (FORTE) satellite data to aid in Radio Frequency sensor development.

Fissile Materials Disposition

LANL is a multi-program lead laboratory for the development of U.S. weapons pit disassembly and conversion technology. The Automated Recovery and Integrated Extraction System (ARIES) demonstration system, located at LANL, serves as the prototype demonstration project for the production-scale facility. The lab also provides technical services, independent design review, independent assessment of the safety basis for the Mixed-Oxide Fuel Fabrication Facility , as well as support for technical aspects associated with monitoring and inspection activities. LANL also provides support to efforts associated with the plutonium conversion line in Russia.

NEVADA TEST SITE

INTRODUCTION:

The Nevada Test Site (NTS) is a unique expanse of federally controlled land and facilities in a remote region of southern Nevada. The approximate 1,375 square miles that make up the Nevada Test Site are surrounded by the Nellis Air Force Range and unpopulated land controlled by the U.S. Bureau of Land Management. Located 65 miles northwest of Las Vegas, the Nevada Test Site is one of the largest secure areas in the United States, due to buffer zones to the west, north, and east. More than 1,000 support buildings and other facilities are spread across the Nevada Test Site.

HISTORY:

In December 1950, President Harry S. Truman announced the establishment of the Nevada Proving Grounds – forerunner of the Nevada Test Site. A total of 928 nuclear tests (100 atmospheric, 828 underground) were conducted at the Nevada Test Site. The current and future missions at the Nevada Test Site are consistent with the Stockpile Stewardship and Management Preliminary Environmental Impact Statement (PEIS), December 1996, the Nevada Test Site, Site-Wide Environmental Impact Statement (SWEIS), December 1996, and the Supplemental Analysis to the Nevada Test Site, SWEIS, July 2002.

MANAGEMENT:

National Nuclear Security Administration:

Nevada Site Office.

Management and Operating Contractor:

The primary contractor is Bechtel Nevada (BN) Corporation (composed of Bechtel Corporation, Lockheed Martin Corporation, and Johnson Controls Worldwide Services). The Management and Operating (M&O) contract, originally scheduled to terminate on December 31, 2000, was extended to September 30, 2005.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	15.4	17.7	13.8
Science Campaign	61.6	54.9	62.5
Inertial Confinement Fusion Ignition and High Yield Campaign	2.4	0	0
Pit Manufacturing and Certification Campaign	46.4	42.8	52.2
Readiness in Technical Base and Facilities	139.7	141.9	101.4
Nuclear Weapons Incident Response	29.8	28.1	29.4
Facilities and Infrastructure Recapitalization Program	17.2	18.9	23.6
Safeguards and Security	34.4	36.0	45.7
HEU Transparency Implementation	.2	.4	.5
Non Proliferation and Verification R&D	10.2	7.0	5.0
International Nuclear Materials Protection and Cooperation	5.0	11.9	2.5
Total NNSA	362.7	360.2	336.9

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
Defense Programs	1,962	1,919	1,908
Other	1,031	1,025	1,082
Total Facility	2,993	2,944	2,990

Congressional Items of Interest

- $5M for experiments to make full use of existing and developing capabilities for Materials Properties studies, including subcritical experiments at U1a, JASPER and ATLAS
- $5M for Research in Technical Base and Facilities (RTBF).
- $25M for continued, upgrades, refurbishments, operations and maintenance costs for the National Center for Combating Terrorism (NCCT)

ACTIVITIES:

WEAPONS ACTIVITIES

Directed Stockpile Work

The Nevada Test Site will develop and execute Subcritical Experiments (SCEs) as defined by Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory (LLNL) to meet certification needs. The work scope includes project management; SCE and laser experiments; test bed construction, development, and design; and procurement and operation of diagnostics systems. Also included are diagnostic development activities required to support future experiments, including control systems, data acquisition, and data analysis. Scope of work for FY 2005 includes the execution and data recovery of Accordian experiment or SCE, diagnostic development for future SCEs, test bed construction for Accordian Prime.

Science Campaign

Bechtel Nevada (BN) provides test bed engineering and construction, diagnostics fielding, controls, and data reduction for the LLNL SCEs. Specifically, in FY 2005, BN will execute on Trumpets and Guitar SCEs.

During FY 2005, BN will also continue to analyze archived data from past nuclear events using modern computer systems and algorithms to support the LANL effort to better understand the existing database of nuclear event information. BN will also continue to support LLNL with diagnostic development and fielding of experiments in support of the Primary Assessment Technology activity, ($40M in FY 2005).

Test Readiness is designed to ensure that an underground nuclear test could be executed within the established time frame by maintaining critical personnel, equipment, and infrastructure resources. Working with the Department of Defense and the Nuclear Weapons Council (NWC), the NNSA began transition to an 18-month test readiness posture in FY 2003. As proposed by NNSA and approved by the Nuclear Weapons Council, and supported by the FY 2004 National Defense Authorization Act, the goal is to reach an 18 month underground nuclear test readiness posture by the end of FY 2005. The transition to an 18 month readiness posture is planned for completion by the end of FY 2005 with continuing maintenance activities for the foreseeable future.

BN will continue to support diagnostic development and fielding of experiments supporting the National Weapons Laboratories. BN will provide support to the Sandia National Laboratories (SNL) in experiments (e.g., Isentropic Compression experiments) and diagnostic development (e.g., VISAR and Pyrometry diagnostics). Special Nuclear Materials (SNM) experiments and diagnostic support at the Joint Actinide Shock Physics Experimental Research (JASPER) are planned to support both LANL and LLNL. BN will also support experiments and diagnostic leveraging gas gun capabilities at LANL. BN will also supplement LANL's effort to conduct materials properties experiments on the Atlas machine at the Nevada Test Site by providing machine operation and diagnostic support. BN will continue to improve and field the unique diagnostics required to obtain Atlas data.

BN will continue to provide support to the LANL efforts on Dual-Axis Radiography Hydrodynamic Test (DARHT) and other advanced radiography test beds.

BN, through the Secondary Assessment Technology activity, ($5.7M in FY 2005) will provide technical services at the Laboratory for Laser Energetics (LLE), Omega, and LLNL Janus Lasers in support of LLNL. BN will continue to support SNL in Z Machine core diagnostic development and characterization on experiments, including X-ray, Optical, Neutron, other diagnostic-related capabilities, and calibration sources and processes.

Pit Manufacturing and Certification

The major activities during FY 2005 include the completion of the Unicorn and Krakatau SCEs and the preparation for future execution of Unicorn Prime and Pinto/Colt SCEs. BN will continue test bed construction operations at the Nevada Test Site and research and development work in direct support of the future SCEs.

Readiness in Technical Base and Facilities (RTBF)

Specific facilities include, Device Assembly Facility (DAF), U1a Complex, JASPER, Control Point Complex, Atlas, High Explosive Facility, BN Los Alamos Technical Facility, BN Livermore Technical Facility, and the North Las Vegas Complex. Key facility activities include sub-critical experiments at U1a, dynamic material property experiments at JASPER, nuclear material handling and weapons incident response at DAF, and pulse power experiments at Atlas.

In FY 2005, the NTS Equipment Revitalization Program will continue to replace and modernize NTS equipment that is obsolete. The Atlas Relocation to the NTS project is nearing completion, and design will begin in FY 2004 on a project to Replace NTS Fire Station No. 2.

Nuclear Weapons Incident Response

NNSA's Nuclear Emergency Search Team (NEST) is based at Nellis Air Force Base, Las Vegas, Nevada, for West Coast response and Andrews Air Force Base, near Washington, D.C., for East Coast response. The NEST can respond to any type of emergency involving radioactive materials in the U.S. or abroad.

Facilities and Infrastructure Recapitalization Program (FIRP)

The FIRP activities include incremental maintenance and infrastructure investments above the base needed to extend facility lifetimes, reduce the risk of unplanned facility system and facility equipment failures or increase operational efficiencies and effectiveness. Recapitalization addresses ongoing issues that aren't addressed in current base efforts, by obviating the need for new replacement facilities and increasing facility and site operational efficiencies. Additionally this element will fund maintenance efforts that reduce maintenance backlogs, and eliminate the need for unplanned repairs for failed facility components. FIRP also has initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction.

Safeguards and Security

This program ensures the protection of NNSA facilities in an integrated, consistent, and complex-wide manner. The program provides Physical Security through a combination of operational security equipment, personnel and procedures to protect facilities, materials and information against theft, sabotage, diversion, or other criminal acts, and Cyber Security for defining and implementing policies and procedures for information protection and the design, development, integration, and deployment of all cyber security-related and infrastructure components at NNSA sites. The site has developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements.

DEFENSE NUCLEAR NONPROLIFERATION

Non-Proliferation and International Security

Includes activities, as directed by Headquarters (HQ), to promote, through the use of technology, the reduction of threats to national security and world peace posed by nuclear, chemical, and biological weapons proliferation and illicit materials trafficking, and assist in fulfilling U.S. commitments for treaty monitoring through development of technology.

PANTEX PLANT

INTRODUCTION:

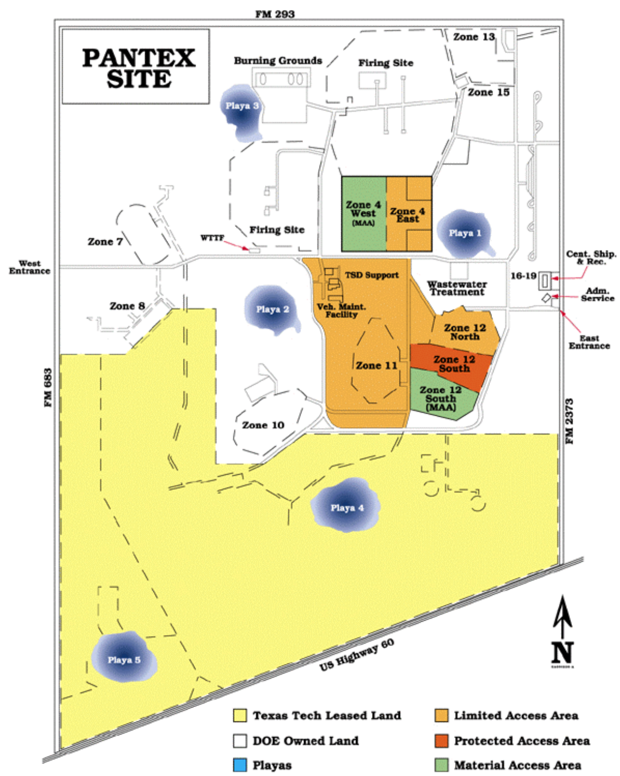
The Pantex Plant is located on 16,000 acres in the Texas Panhandle, approximately 17 miles northeast of Amarillo, Texas.

HISTORY:

Constructed by the U.S. Army, in 1942, as a conventional bomb plant, Pantex was decommissioned after World War II and sold to Texas Tech University as excess government property. In 1951, the Atomic Energy Commission (AEC) reclaimed 10,000 acres of the site for nuclear weapons work from Texas Tech. The remaining 6,000 acres were reclaimed by 1989 and are leased from Texas Tech.

Pantex assumed responsibility for weapons maintenance and modification in the mid-1960s, when plants that had been performing those tasks closed. With the closure of the AEC Burlington Plant in Iowa in 1975, Pantex became the nation's only assembly and disassembly point for nuclear weapons.

The current and future missions are consistent with the Records of Decisions for the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (PEIS), December 19, 1996, and the Storage and Disposition of Surplus Weapons Usable Fissile Materials PEIS, January 14, 1997.



MANAGEMENT:

National Nuclear Security Administration Management:

Pantex Site Office

Management and Operating Contractor:
BWXT Pantex, LLC was awarded a 5-year contract for the management and operation of the plant. This contract began February 1, 2001 and has a value of $1.7 billion over 5 years. After the contract period, Department of Energy (DOE) has the option to extend the contract for another 5 years.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	115.5	121.6	115.4
Engineering Campaign	3.3	6.6	4.1
Readiness Campaign	19.1	31.3	40.1
Readiness in Technical Base and Facilities	148.7	139.1	156.1
Nuclear Weapons Incident Response	1.0	1.1	1.2
Safeguards and Security	89.1	93.0	109.8
Facilities and Infrastructure Recapitalization Program	27.3	29.6	36.9
Fissile Materials Disposition	8.0	8.3	8.7
Other NNSA	1.0	.6	1.6
Total, NNSA	409.2	431.3	471.6

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	3,410	3,405	3,308
Other	89	94	91
Total Facility	3,499	3,499	3,399

Congressional Items of Interest
$5M for RTBF Operations of Facilities will be used for the following activities: 12-84 Production Bay LINAC Installation; Electro Static Discharge (ESD) Flooring Installation; Production Cells Penetration Leak Reduction; 12-52B Metrology Lab High Pressure Calibration System Replacement; 12-53 Metrology Calibration Facility Spectrum Analyzer Replacement; Plant Telephone System Upgrade; 12-21A Explosive Radiography HE Real-Time Radiographic Inspection Upgrade; Sitewide Backflow Prevention Installation

ACTIVITIES:
WEAPONS ACTIVITIES
Directed Stockpile Work (DSW)
Pantex is the assembly/disassembly plant for all nuclear weapons. Costs include procurement of materials (exclusive of nuclear materials); fabrication and assembly of nuclear weapons and weapon components; lifetime surety maintenance and reliability assessment of the enduring stockpile; weapon dismantlement and disposal; and maintenance of field training manuals for activities that directly

support weapons in the enduring nuclear stockpile, including current maintenance; day-to-day care, and development, engineering, and certification activities to support planned life extensions.

Engineering Campaign
BWXT Pantex supports the Enhanced Surveillance activity of Engineering Campaign strategic objectives by performing aging studies on explosives and nonnuclear materials and components and providing the results to the design agencies. BWXT Pantex also works with the design labs to develop and deploy new diagnostics tools for implementation into DSW.

Readiness Campaign
The Pantex Plant is dependent upon the Advanced Design & Production Technologies (ADAPT) and High Explosives (HE) and Weapons Operations activities for the Enterprise and Science Based Tools and Process Development to establish processes to meet Base Workload and Life Extension Program (LEP) requirements.

Readiness in Technical Base and Facilities (RTBF)
The RTBF Program provides the physical infrastructure and operational capabilities required to conduct the DSW and Campaign activities. This includes ensuring that facilities are operational, safe, secure, compliant, and that a defined level of readiness is sustained to perform the current and future Pantex mission. In addition to the RTBF Program elements, the companion programs and Construction work cooperatively with the RTBF elements. Construction projects currently in design and scheduled for construction in FY 2004 and FY 2005 at Pantex include: Special Nuclear Material (SNM) Component Requalification facility, Building 12-44 Production Cells Upgrade, and Building 12-64 Production Bays Upgrade.

Facilities and Infrastructure Recapitalization Program (FIRP)
FIRP has initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction. The Roofing Asset Management Program (RAMP) has replaced erosion control systems over four large mission critical facilities used to develop and perform testing on high explosives. In the area of facility disposition, operating costs have been reduced by removing over 40,000 gross square feet of excess facilities. Two design projects will be initiated in FY 2005: Electrical Distribution System Upgrade and Gas Main and Distribution Lines Upgrade.

Safeguards and Security
In FY 2005, the Pantex Plant will enhance specifically identified weapons for use by protective forces to intensify capability against terrorist threats. The plant has developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements.

DEFENSE NUCLEAR NONPROLIFERATION
Fissile Materials Disposition
The Pantex Plant stores surplus pits pending shipment to Los Alamos National Laboratory to support the Pit Disassembly and Conversion Facility (PDCF) technology demonstration. The Pantex Plant also packages and stores surplus pits for future shipment (estimated to begin around FY 2010) to the SRS for conversion in the PDCF prior to fabrication into Mixed-Oxide fuel.

SANDIA NATIONAL LABORATORIES

INTRODUCTION:

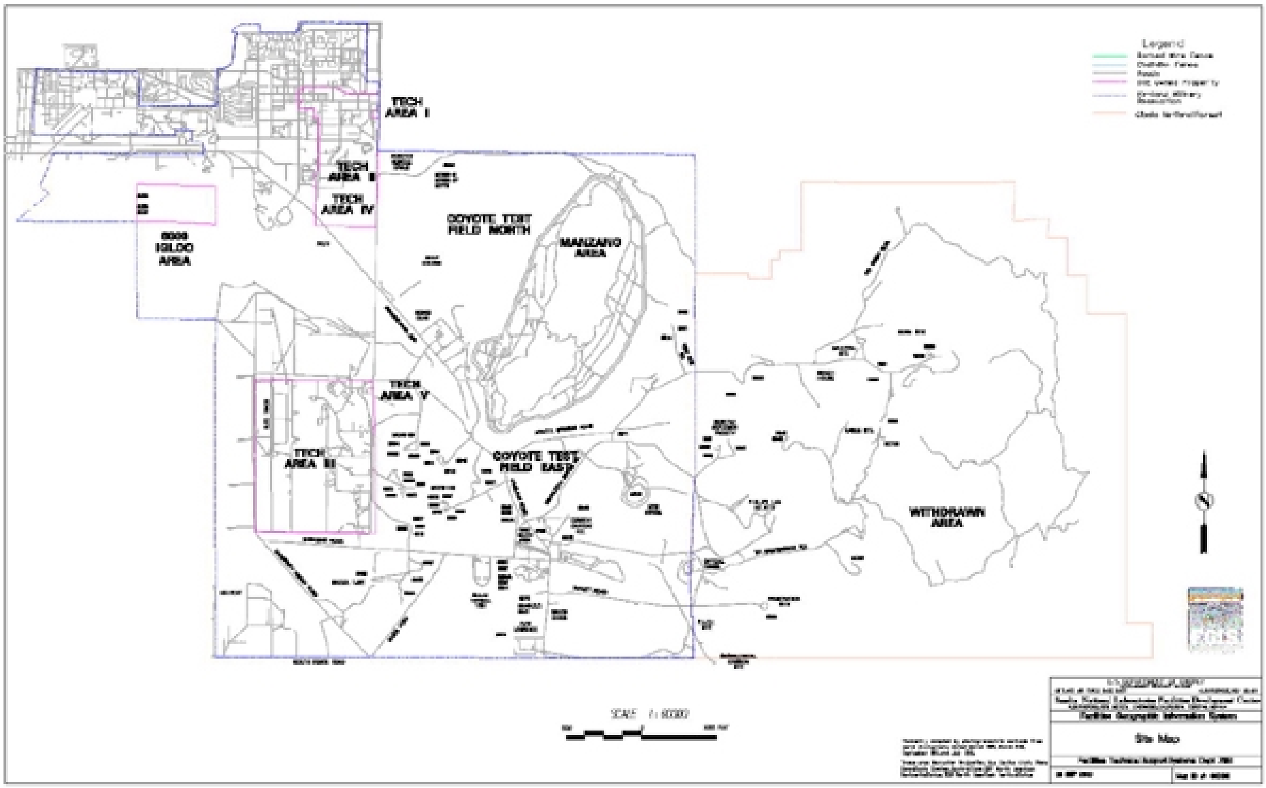
Sandia National Laboratories/New Mexico (SNL/NM) is located on the 75,520 acre Kirtland Air Force Base military reservation, about 6.5 miles east of Albuquerque, New Mexico. It occupies nearly 9,000 acres on the Kirtland reservation and has additional facilities in Livermore, California (400 acres), Kauai, Hawaii (120 acres) and Tonopah, Nevada (600 square miles).

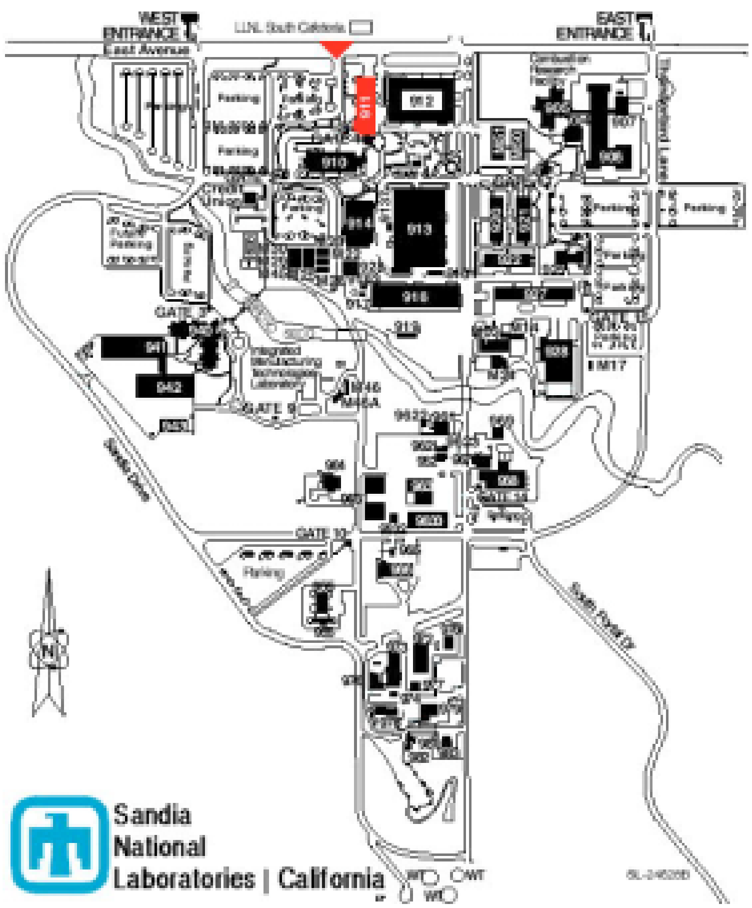
HISTORY:

The Sandia/NM site was a branch of the Los Alamos National Laboratory (LANL) before becoming a separate entity, in 1949, under management of the American Telephone and Telegraph Company. In 1993, Martin Marietta-Lockheed Martin assumed responsibility for the Sandia National Laboratories (SNL) management contract. The SNL/Livermore site, in Livermore, California opened in 1956.

A Record of Decision on the Site-Wide Environmental Impact Statement for the continued operation of the laboratory was published in December 1999. The preferred alternative is for expanded operations consistent with the Record of Decision for the Stockpile Stewardship and Management Programmatic Environmental Impact Statement, issued December 19, 1996. The statement includes the environmental analysis for the Microsystems and Engineering Science Application (MESA) facility.

The Deputy Administrator for Defense Programs is both the Cognizant Secretarial Officer, having line management accountability for SNL, and the Lead Program Secretarial Officer, responsible for landlord activities and overall SNL site integration and operations.


TECH AREA I
TECH AREA II
TECH AREA IV
6000 IGLOO AREA
COYOTE TEST FIELD NORTH
MANZANO AREA
TECH AREA V
TECH AREA III
COYOTE TEST FIELD EAST
WITHDRAWN AREA
Site Map


WEST ENTRANCE
East Avenue
LLNL South Cafeteria
EAST ENTRANCE
Parking
912
911
910
913
915
941
942
GATE 9
GATE 10
Integrated Manufacturing Technologies Laboratory
Sandia Drive
South Patrol Dr.
Sandia National Laboratories | California

MANAGEMENT:

National Nuclear Security Administration Management:

Sandia Site Office

Management and Operating Contractor:

Lockheed Martin Corporation. The current contract expires September 30, 2008.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	406.7	439.3	451.6
Science Campaign	14.3	14.6	15.3
Engineering Campaign	208.0	184.8	161.9
Inertial Confinement Fusion Ignition and High Ignition and High Yield Campaign	36.6	45.6	46.3
Advanced Simulation and Computing	148.0	137.4	130.8
Readiness Campaign	21.5	24.4	23.8
Readiness in Technical Base and Facilities	206.8	259.6	201.2
Nuclear Weapons Incident Response	7.9	8.3	8.5
Safeguards and Security	68.8	75.5	93.5
Facilities and Infrastructure Recapitalization Program	25.2	28.5	34.7
Nonproliferation and Verification R&D	77.8	71.4	64.8
International Nuclear Materials Protection and Cooperation	59.9	55.6	54.2
Russian Transition Initiatives	4.3	4.4	4.5
Nonproliferation and International Security	18.9	24.4	18.0
Other NNSA	2.1	2.9	2.9
TOTAL NNSA	1,306.8	1,376.7	1,312.0

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	5,059	5,075	5,125
Other Department of Energy	470	478	487
Work For Others	2,257	2,282	2,320
Total Facility	7,959	8,009	8,107

Congressional Earmarks

- $4M to initiate assessments and initial development/testing for Z Pinch inertial fusion energy, (ICF).
- $5M for Z Beamlet laser modifications to the Z machine, (RTBF).

ACTIVITIES:
WEAPONS ACTIVITIES
Directed Stockpile Work (DSW)
SNL supports DSW activities to: ensure the reliability, safety and security of the current and future nuclear weapon stockpile in an affordable manner; define, prioritize and integrate the science and technology needs of the future stockpile while reducing risk, cycle times and cost; deliver all required production hardware on time and at the lowest achievable cost; assure integration occurs without costly gaps and overlaps among Defense Programs and Sandia National Laboratories' (SNL) Nuclear Weapons Strategic Management Unit programs; acquire, nurture, and deploy the people necessary to carry out the mission and provide them with the knowledge and information to do their job in a secure manner; and ensure the Nation has confidence in the SNL ability to assure the surety of the nuclear weapons stockpile and protect the information entrusted to SNL.

SNL supports the Life Extension Program (LEP) activities and, in FY 2005, will support the W76-1 Development Joint Test Assemblies (JTA) 1-2 and
1-3. In September 2005, for the October 2005 follow-on CINC (commander-in-chief) evaluation test (FCET) – 34 and on the W80-3, SNL will conduct final design review and independent peer review (IPRs) and issue associated engineering releases per the W80-3 baseline schedule. Within the Enduring Stockpile activities, SNL supports the requirements to keep the stockpile safe, secure and reliable by supporting weapon alterations (ALTs) and, in FY 2005, will conduct B61-3,4,7,10, & 11 ALT 356/358/359 development, design, and peer review and initiate flight test by the end of FY 2005. Within the production mission, in FY 2005, SNL will complete all production deliverables in accordance with the W76 Program Management Document (PMD) schedules and the LEP Integrated Schedules by the end of September 2005.

In addition, Sandia will begin testing JTA 4 qualification unit and complete the W87 JTA 4 Final Design Review in February 2005. Finally, SNL activities support multiple systems and, in this area, SNL will support Use Control System Development, JTA technology development, Pre-Phase 3 Studies, Code Management System Initial Operational Capability, U. S. Strategic Command Advanced Code and Control/Navy Depot, AFMC Depot, Pantex, and the Advanced Military Technologies Memorandum of Understanding.

Science Campaign
SNL leverages its unique capabilities as the DOE Pulsed Power Center for Excellence for a variety of Science Campaign missions. These include design, development, and deployment of state of the art compact, reliable, and high intensity flash x-ray radiographic sources for SubCritical Experiments (SCEs) at the Nevada Test Site (NTS) and above-ground dynamic experiments at Los Alamos National Laboratory (LANL) and Atomic Weapons Establishment (AWE). SNL also develops intense energetic radiation sources, sophisticated x-ray diagnostics, and the Z-Beamlet Laser radiography capability and supports their utilization by LANL for Secondary Assessment Technology ($2.1M in FY 2005) in radiation transport, complex hydrodynamics, and integrated implosions. Pulsed power also provides another unique capability to isentropically compress (i.e. shocklessly) and shock compress materials to high pressures thus providing equation of state and constitutive property data to SNL, LANL and Lawrence Livermore National Laboratory (LLNL) materials communities for inclusion in models and the quantification of margins process. In addition, SNL is developing new material processes and modeling in nonnuclear materials to advance the state-of-the-art.

SNL supports other areas within the Science Campaign Subprogram. In the Primary Assessment Technology activities, ($5.1M in FY 2005) SNL, with Bechtel Nevada and LANL, is deploying the twin pulsed Cygnus accelerators at the NTS for the Armando SCE and are developing advanced high intensity electron sources for more penetrating future dynamic experimental missions. In the Dynamic Materials Properties activities, ($7.9M in FY 2005) SNL will provide equation of state (EOS) data on explosives and byproducts plus validate multi-materials sintering models. Within the Secondary Assessment Technology activities, SNL will prepare for utilizing the higher currents that will be available when the Refurbished Z facility is commissioned in FY 2006.

Engineering Campaign

Through the Engineering Campaign, Sandia is developing the product technologies and assessment tools required to support the design, qualification, and continued certification of the existing nuclear weapon stockpile, currently planned refurbishments, and any potential new weapon developments, as authorized. Specifically, Enhanced Surety activities ($33 M in FY 2005) develop architectures, subsystems, components, and technologies to enhance the safety, security, and use control of the stockpile. Scheduled refurbishments provide one timeline against which to mature technologies, and the campaign is now developing surety options and technologies for the B61 and W78 LEPs.

Weapons Systems Engineering Assessment Technology activities ($23 M in FY 2005) provide state-of-the-art experimental capabilities that are closely integrated with our computational activities and activities that are targeted to support the qualification, certification, and assessment of enduring stockpile systems and Stockpile LEPs. Nuclear Survivability activities ($22 M in FY 2005) develop the qualification technologies needed to assess the performance of nonnuclear components in hostile environments. Development of radiation-hardened processes and technologies will also be demonstrated. Enhanced Surveillance activities at Sandia provide key thrusts in Sandia's program for the development of advanced surveillance testers for the Weapons Evaluation Test Laboratory (WETL), development of advanced telemetry for enhanced fidelity instrumentation, prototyping of a modern component surveillance program, and the fundamental materials research necessary to underpin advanced materials and subsystem models.

Sandia’s largest-to-date construction project, the Microsystems Engineering Sciences and Applications (MESA) Complex, officially broke ground on major facility construction activities on August 19, 2003.

Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign

The SNL ICF activities support the High Energy Density Physics (HEDP) experimental program on the Z pulsed power facility. In FY 2004 and FY 2005, SNL will be reaching full single shift operation of the Z facility to accommodate a greater number of the requested stockpile stewardship experiments (the Dynamic Materials, Secondary Assessment Technology, and Nuclear Survivability activities and DSW issues), pulsed power ICF and x-ray source development, and a combination of basic science, z-pinch physics, power flow, and Inertial Fusion Energy experiments. The ICF Subprogram also maintains, operates, and develops the diagnostics capability associated with the Z-Beamlet back lighter facility that is coupled to the Z pulsed-power facility. Research at these facilities is performed in cooperation and collaboration with the other national laboratories, Defense Threat Reduction Agency, universities, and Atomic Weapons Establishment.

Advanced Simulation and Computing (ASCI) Campaign

The ASCI activities at Sandia will deliver validated software for application to the SNL nuclear weapon stockpile mission, the computing infrastructure to provide a user environment for the SNL weapon engineers and analysts, and the ASCI-scale computing platforms for both capability and capacity computing requirements. SNL supports numerous areas within the ASCI Campaign that are integrated across the nuclear weapons complex. In FY 2005, SNL will move the 40-T Red Storm computer into a full production environment. Also, In FY 2005, SNL will deliver a validation process to support the W76-1 qualification in hostile blast and impulse environments, deliver validated models for thermal-mechanical shock for first application to the W76-1, and deliver a validated model for 3-Dimensional box internal electromagnetic pulse for first application to the W76-1.

Construction projects in support of ASCI that are currently underway at Sandia include: the Distributed Information Systems Laboratory (DISL) in Livermore, California and the Joint Computational Engineering Laboratory in Albuquerque.

Readiness Campaign

SNL supports numerous areas within the Readiness Campaign. For the Advanced Design and Production Technologies (ADAPT) activities, ($17.6 M in FY 2005) SNL provides a leadership role as the Nuclear Weapons Complex system integrator, having a significant role in production and associated process development decisions and as the engineering Design Agency. SNL leads in the support of enabling technologies for production of advanced concepts. SNL also leads in the enterprise integration functions due primarily to the leadership and expertise in the information environment designs and developments. The ADAPT activities will support high priority activities currently underway including complete complex-wide availability of secure, distributed electronic access to weapon information (FY 2006); and complete highest-priority Nuclear Weapons Complex Technical and Infrastructure Business Practices. (FY 2005)

The SNL Nonnuclear Readiness role ($6.1 M in FY 2005) is scaled to the respective portion of production responsibilities and is generally, at this time, limited to the replacement or refurbishment of obsolete equipment, primarily testers for neutron generators, for SNL production mission responsibilities

Readiness in Technical Base and Facilities (RTBF)

The types of projects within RTBF range from the staffing and operation of complex experimental capabilities (e.g., Z, SNL Pulsed Reactor, and Tech Area-III Full Scale Test Facilities) or production capabilities (e.g., Microelectronics Development Laboratory and Neutron Generator Plant) to the infrastructure fundamentals of Decommissioning and Demolition and General Plant Projects (GPPs). The common thread is that the RTBF activities are essential to develop and maintain the suite of capabilities necessary for SNL to be able to carry out its Defense Program missions today and in the future.

Construction projects currently in design or underway at Sandia include: Weapons Evaluation Test Laboratory (being constructed by SNL at Pantex); Test Capabilities Revitalization, Phase I; and Exterior Communications Infrastructure Modernization. Design will be initiated in FY 2005 for the Test Capabilities Revitalization, Phase II, project.

Safeguards and Security

In FY 2005 through FY 2007, efforts will support the restart of the Sandia Pulse Reactor, which will be used to support a Defense Programs Weapons Initiative. In FY 2005-09 SNL will complete four phases to develop a baseline for transition from an aging manually-operated electronic security system to an automated access control function.

As part of the National Threat Level Alert System, the laboratories may occasionally have to implement additional compensatory security measures. These periods of heightened security require an increased expenditure of funds and use of resources. The laboratories have developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements.

Nuclear Weapons Incident Response (NWIR)
SNL NWIR activities include the conduct of operations and technical integration in support of the Joint Technical Operations Team (JTOT), Accident Response Group (ARG), and Home Team (HT) in the form of: Technical Support, Research & Development, Intelligence Support, Field Operations, and Training & Exercises.

Facilities and Infrastructure Recapitalization Program
Refurbishment projects for the facilities housing the Light Initiated High Explosive Complex, Radiography, Vibration Facility, Explosives Applications, and the Photometrics and Data Acquisition activities are essential to meet NNSA requirements. The Z-Accelerator facility repairs are meeting the demands of several Campaigns. Execution of the deferred maintenance projects for these facilities is reducing the backlog for the site. Facility Disposition activity has reduced excess facility areas by some 150,000 gross square feet at the site.

Two projects will be initiating design at Sandia: the New Master Substation, TA I & IV, will begin design in FY 2004, and the TA-I Heating System Modernization project will begin design in FY 2005.

DEFENSE NUCLEAR NONPROLIFERATION
Nonproliferation and International Security
The Treaty Verification & Nonproliferation and International Security (NIS) Technology Program involves the development of the technology to monitor compliance with treaties relating to nuclear testing limitations. These technologies encompass both space-based and earth-based sensor systems. Successful development and deployment of these systems will allow the United States and, in some cases, our international partners, to monitor treaty compliance.

The International Security Program involves five broad areas of responsibility including: International Nuclear Security (particularly Russia), International Border Security, Regional Security Cooperative Engagements, International Safeguards and Physical Security, and other NIS Activities Internationally. These activities involve cooperative bilateral or multilateral activities that differentiate this program from other unilateral activities that support the U.S. NIS strategies. Objectives are accomplished by providing technically informed policy support including, where appropriate, the development of integrated technology solutions to address the needs of a wide range of partners and customers, both domestically and internationally.

Nonproliferation and Verification Research and Development
The SNL will develop, demonstrate, and validate improvements to data processing and analysis tools in

support of nuclear explosion monitoring. Sandia will support the development new spectral detectors for next generation of U.S. satellite-based monitoring to detect nuclear detonations. SNL serves as the national center on research on Synthetic Aperture Radar systems and analysis methods for national security applications. SNL will continue field-testing a remote chemical detection system for stand off detection of nuclear weapon production activities. SNL will continue to develop radiation algorithms to improve performance of commercially available handheld and portal systems.

International Nuclear Materials Protection and Cooperation

Based on their extensive work for the NNSA, Department of Defense (DoD), and other federal agencies, SNL provides experience with the design and installation of physical protection systems and has specific technical expertise in access delay systems; intrusion detection and assessment systems and associated display systems; access control systems; and vulnerability analysis procedures, processes and associated computer codes. The SNL also provides expertise to advise Russian institutes and enterprises as they develop and implement physical protection systems, regulations, and training programs and to support NNSA's Second Line of Defense and Radiological Threat Reduction programs.

SAVANNAH RIVER SITE

INTRODUCTION:

The Savannah River Site (SRS) is a Department of Energy (DOE)-owned facility covering approximately 310 square miles bordering the Savannah River in western South Carolina. The Office of Environmental Management is the site landlord. The Savannah River Site is designated as a National Environmental Research Park and covers a portion of Aiken, Barnwell, and Allendale counties.

The SRS Tritium Facility occupies approximately 25 acres in the northwest portion of H-Area, near the center of the Savannah River Site. The SRS Tritium Facility includes a total of five production structures, thirteen administrative office structures, five storage structures and twenty-two service structures. The five production buildings house tritium reservoir loading and unloading, tritium recovery and purification, reservoir reclamation, reservoir surveillance testing and evaluation, and Life Storage Program research activities. The Tritium Extraction Facility (TEF), capable of extracting tritium gas from targets to ensure the future availability of tritium, is being constructed in this area. Additional significant Savannah River Technology Center facilities for tritium and materials research and development are located elsewhere on the Savannah River Site.

HISTORY:

The SRS is a key U.S. DOE facility constructed in the early 1950s to produce basic materials used in nuclear weapons, primarily tritium and plutonium. DuPont managed the site until April 1989. Since that time, Westinghouse Savannah River Company (WSRC) Limited Liability Company (LLC) has been the operating contractor of SRS. The company is a consortium of four partner firms: Westinghouse Savannah River Company, Bechtel Savannah River Company, Inc., BNFL Savannah River Corporation, and BWXT Savannah River Company. Today, in addition to various environmental management activities, recycling and reloading tritium to keep the nation's supply of nuclear weapons ready is a continuing site mission.

Aerial Photo of SRS Tritium Facility

MANAGEMENT:

NNSA Management:

Savannah River Site Office
Fissile Material Disposition Office, SRS

M&O Contractor:

WSRC is the operating contractor and the current expiration date is September 30, 2006.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	30.1	29.6	40.6
Science Campaign	1.8	1.6	2.8
Engineering Campaign	0.5	1.2	1.0
Pit Manufacturing and Certification Campaign	1.9	5.5	9.0
Readiness Campaign	94.7	99.1	55.5
Readiness in Technical Base and Facilities	102.9	90.9	107.1
Nuclear Weapons Incident Response	0.6	0.1	1.5
Safeguards and Security	11.6	12.6	13.1
Facilities and Infrastructure Recapitalization Program	8.4	7.8	8.2
Fissile Materials Disposition	43.5	46.6	47.4
Nonproliferation and International Security	4.6	4.0	3.4
Int'l Nuclear Materials Protection and Cooperation	0.3	0.2	0.5
Russian Transition Initiatives	1.0	1.0	1.0
Total NNSA	305.3	303.3	294.4

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	2,220	2,217	2,245
Other DOE	10,724	10,705	10,615
Work For Others	41	41	41
Total Facility	12,985	12,963	12,901

Congressional Items of Interest

- None

ACTIVITIES:

WEAPONS ACTIVITIES

Directed Stockpile Work (DSW)

SRS meets the DSW requirements by processing tritium and inert reservoirs and associated components in support of Limited Life Component Exchange (LLCE), Life Extension Programs (LEPs), Shelf Life Tests, and Reservoir Surveillance Operations. Reservoirs and associated parts will be processed as necessary to support LLCE schedules per production directive requirements for the enduring stockpile. Reservoir-processing operations include receiving, proof testing, loading, fill stem pinch welding, finishing, assembly, inspection, and packaging for shipment. Returned reservoirs will be unloaded to support production needs and to meet Reservoir Age Management Program (RAMP) goals. Reusable unloaded reservoirs will be reclaimed and reprocessed for stockpile service; retired reservoirs will be welded closed to prepare them for disposal. Reservoirs returned from retired weapons systems will be unloaded, welded closed for disposal, or managed per shelf life testing requirements.

The LEP activities include costs for planning, pre-production, production, and evaluation associated with the refurbishment of the B61-7/11, W76-1, and W80-2/3. These activities involve weld and fixture development, loading and processing of prototypes, initial life storage, qualification, and first production units. Shelf Life Test activities also include environmental conditioning, function testing, precision unloading, hydraulic burst testing and destructive examination of tritium reservoirs, metallography reporting and data analysis. The Life Storage Program (LSP) conducts research to determine the effects of long-term tritium exposure on reservoir designs and materials to improve personnel protection and increase the safety of weapons components. SRS supports the LLCE mission by meeting monthly shipping requirements in the current version of the Production & Planning Directives. SRS will begin processing an additional component for the B61 LEP. Material testing for the W84 system begins in FY 2005.

Science Campaign

Science Campaign efforts at SRS include study of tritium storage materials, tritium effects on materials, and processes.

Engineering Campaign

The Engineering Campaign activities involve development of new surveillance techniques for gas transfer systems. In FY 2005, SRS will begin to develop and implement new surveillance technologies required for the Acorn reservoir systems and additional new requirements for the Terrazzo.

Readiness Campaign

The SRS role in support of the Tritium Readiness program is to design, construct, start-up, and operate a Tritium Extraction Facility (TEF). The TEF will provide the capability to receive and extract tritium-containing gases from tritium producing burnable absorber rods (TPBARs). This will provide sufficient tritium to support stockpile requirements. The TEF will be located adjacent to building 233-H in order to share common facilities. The TEF will be designed for a 40-year operating life. This activity also includes the Other Project Costs (OPCs) portion of TEF. In FY 2005, this will entail component system and integrated start-up testing, development of operating and maintenance procedures, and training of the operating staff. This will entail completion of Construction for the Tritium Process Building and the Remote Handling Building, plus subsystems within these buildings, continued development of the Facility Safety Analysis Report, and delivery of remaining engineered equipment. Additional start-up tests will be performed as systems are turned over from construction to start-up. Training of operating staff and procedure development efforts will continue.

At SRS,ADAPT activities are focused on tritium production and processing technologies and on the development of new reservoirs and the associated reservoir processing and inspection technologies. The goal of Enterprise Integration (EI) is to provide the infrastructure that makes information readily available and to provide the tools and business practices to fully utilize the information. Secure computer networking capabilities and inventory management tools are part of the EI effort at SRS. Two major items will be provided in FY 2005: 1) Initiation of development of hydride alloy manufacturing capabilities (about $2 m). To date, all work in this area has been at a university. The technology transfer to SRS will begin for completion of development work. 2) Initiation of SRS activities in the Integrated Design Engineering and Manufacturing MTE (about $1M). This will bring SRS in line with the rest of the complex in the world of models-based engineering and other agile manufacturing activities.

Readiness in Technical Base and Facilities (RTBF)

RTBF work maintains the facilities and infrastructure in a state of readiness in support of mission operations including LLCE, LEPs, Shelf Life Test, and Reservoir Surveillance Operations. Operations of Facilities include facilities management and support activities that maintain the facilities and infrastructure in a state of readiness for mission operations. Preventive, predictive, and corrective maintenance of process and infrastructure equipment/facilities is performed. Environmental, safety, and health activities are conducted to ensure the well being of SRS workers, the public, and the environment. Contracted costs of providing utilities to the Tritium Facility are included, as well as OPCs associated with RTBF line item projects. Capital Equipment and General Plant Projects that meet base maintenance and infrastructure needs are planned and executed to maintain the safety, utility, and capability of the process facilities.

Material Recycle and Recovery involves recovery and purification of tritium, deuterium, and helium-3 gases from reservoir recycle gas and facility effluent cleanup systems. Gas mixtures are enriched to support the LLCE mission. SRS maintains H1616, SR-101, and UC-609 shipping containers and Hydride Transport Vessels (HTVs), and provides operational, regulatory, and technical support of H1616s, SR-101s, UC-609s, HTVs, and Pressure Vessels (PVs).

The Capability for Advanced Loading Missions (CALM) project will modify existing SRS facilities to provide a process that will support the Acorn reservoir LEP. The project will provide added reservoir cleaning and loading capabilities and increased capacity to satisfy anticipated production requirements. It will modify an existing reservoir loading line to enable both cleaning and filling of Acorn reservoirs and provide additional unloading capabilities for Acorn reservoirs. The CALM design effort will start in FY 2005 with final design completing in FY 2006. Procurement, Construction, Start-up, and Qualification phases are forecast to be completed during FY 2005 through FY 2009.

Facilities and Infrastructure Recapitalization Program (FIRP)

For the Tritium Facility, the FIRP activity is supporting replacement of obsolete infrastructure, improving mission readiness, and the demolition and removal of excess facilities. Priority deferred maintenance projects are undertaken to reduce the backlog. The projects include elimination of a fire protection issue identified by the Defense Nuclear Facilities Safety Board, electrical projects that permit the supply of reliable power to two mission essential production buildings, and roofing upgrades to three mission essential buildings, and the replacement of the air-handling unit supporting the inert reservoir-loading facility.

DEFENSE NUCLEAR NONPROLIFERATION

Fissile Materials Disposition

Savannah River Site is selected for disposition of U.S. plutonium and, as such, provides design authority for PDCF and site coordination services for Mixed-Oxide Fuels (MOX) Fuel Fabrication Facility (FFF) and Pit Disassembly and Conversion Facility (PDCF). SRS also supports design review of MOX FFF and integration of the two plutonium disposition facilities with other site support services (actual design of facilities is contracted to private sector firms). In addition, SRS provides down-blending services for off-specification highly enriched uranium (HEU). During the construction phases of MOX FFF and PDCF, SRS will be responsible for site integration and construction of site infrastructure including electric power, water & sewer, roads, communications, waste management, fire protection, security and related services.

The H Canyon is being used to down blend HEU fuel assemblies to Low Enriched Uranium for transfer to the Tennessee Valley Authority (TVA) for use in nuclear power plants. In addition, other forms of HEU are being transferred directly to TVA for conversion to reactor fuel. This is reducing the HEU inventory and the threat of HEU being used for weapons and reduces the long-term storage cost of HEU.

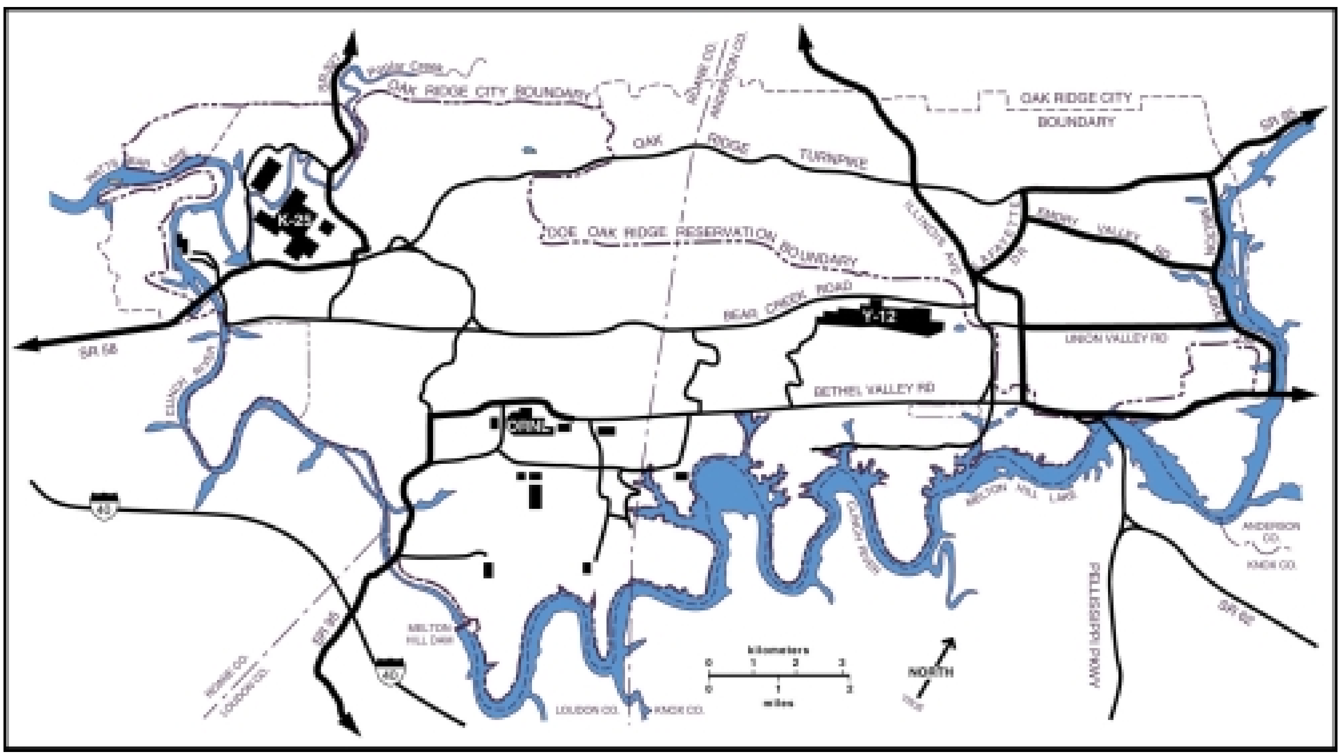
Y-12 NATIONAL SECURITY COMPLEX

INTRODUCTION:

The Y-12 National Security Complex (Y-12) is located on approximately 800 acres of the almost 35,000-acre Oak Ridge Reservation, about 20 miles west of Knoxville, Tennessee. The Y-12 Site Office provides federal oversite and manages the National Nuclear Security Administration (NNSA) Management and Operating (M&O) contract for Y-12. The facilities were originally constructed in 1943, as part of the Manhattan Project, for the production of enriched uranium.

HISTORY:

The Y-12 current and future missions are consistent with the Records of Decision for the Disposition of Surplus Highly Enriched Uranium Environmental Impact Statement (EIS) of July 29, 1996, the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (PEIS) of December 19, 1996, and the Storage and Disposition of Surplus, Weapons Usable Fissile Materials PEIS of January 14, 1997.



MANAGEMENT:
National Nuclear Security Administration Management:

Y-12 Site Office

Management and Operating Contractor:

BWXT Y-12, L.L.C. was awarded the contract for management and operation of the site November 1, 2000.

TABLES

FUNDING AND EMPLOYMENT:

(dollars in millions)

FUNDING	FY 2003	FY 2004	FY 2005
NNSA			
Directed Stockpile Work	195.7	219.0	237.8
Science Campaign	3.6	3.1	3.4
Engineering Campaign	3.5	7.7	6.1
Advanced Simulation and Computing Campaign	.5	0	0
Pit Manufacturing and Certification Campaign	0	.1	0
Readiness Campaign	47.9	71.3	55.6
Readiness in Technical Base and Facilities	278.1	230.3	247.9
Safeguards and Security	77.8	82.0	99.5
Facilities and Infrastructure Recapitalization Program	61.4	63.4	75.3
Nuclear Weapons Incident Response	.8	.8	1.5
Fissile Materials Disposition	48.0	44.5	54.6
Nonproliferation and International Security	11.1	.5	.5
HEU Transparency Implementation	4.4	4.0	4.3
Other NNSA	1.5	1.4	1.4
Total, NNSA	734.3	728.1	787.9

CONTRACTOR EMPLOYMENT (End of Year)	FY 2003	FY 2004	FY 2005
NNSA	3,986	3,934	3,918
Other	540	566	582
Total Facility	4,526	4,500	4,500

Congressional Items of Interest

- $10M within DSW to complete W87 LEP closeout activities in FY 2004.
- $5M for RTBF Operations of Facilities which will support the preventative maintenance program for the 12 major production buildings, address the deferred maintenance backlog, support deactivation

and clean-up costs for buildings such as 9201-5 to accelerate footprint reduction.

ACTIVITIES:

WEAPONS ACTIVITIES

Directed Stockpile Work (DSW)

The Y-12 Complex maintains the only capability in the U.S. to fabricate precision parts and components (from certain materials) for nuclear weapons. Every nuclear weapon produced in the U.S. has components that were fabricated at Y-12. Y-12 is also involved in the evaluation of components and subsystems returned from the stockpile, the dismantlement of secondaries, and the processing of recovered special nuclear materials. The Complex is currently in the fourth year of a 4½-year effort, supporting the refurbishment of the W87 Life Extension Program (LEP). Planning is also underway to support future LEPs, such as the B61 First Production Unit (FPU) currently scheduled for February 2006 (Y-12)/June 2006 (Complex) and the W76 currently scheduled for March 2007 (Y-12)/September 2007 (Complex).

Significant FY 2005 activities include: process prove-in for the B61, preparation for the W76 FPU, and continuation of evaluation and dismantlement activities.

Science Campaign

Planned FY 2005 projects include: evaluate material properties for ceramics, evaluate historical information on U-6Nb and Enriched Uranium (EU) properties and determine material properties, and evaluate effect of proposed process changes on Fogbank material properties.

Engineering Campaign

Planned FY 2005 projects include: developing weapon specific aging models, evaluation and process development for non-destructive laser gas sampling system and enhanced low-temperature thermal decomposition system, evaluate corrosion mechanisms for metals of interest, and continue special material characterization.

Advanced Simulation and Computing (ASCI) Campaign

Planned FY 2005 projects include: integrated monitoring of Y-12 application availability and network performance, and inter-network infrastructure to support data accessibility.

Readiness Campaign

Planned FY 2005 projects include: Zone Refining, Enclosed Hazardous Material Processing, Chip and Coolant, Alternate Feed Study, Sensors for Holdup, IR Heating of Uranium, Manufacturing Engineering Integrated Desktop, Agile Machine Tool, Materials Knowledge Repository, Casting Process Science Basis, and Advanced Metrology Platform.

Readiness in Technical Base and Facilities (RTBF)

Key activities in FY 2005 include the continued safe operation of the major Y-12 production facilities and preparation for material transfer to the Highly Enriched Uranium Materials Facility (HEUMF) when completed. In addition, the Purification Facility Construction project is currently underway at Y-12 and the Beryllium Capability project begins design in FY 2004 and construction in FY 2006.

Facilities and Infrastructure Recapitalization Program (FIRP)
Through the FIRP activities, Y-12 has been able to establish a strong deferred maintenance reduction program that is focused on supporting DSW and three major campaign activities: Enhanced Surveillance, Stockpile Readiness, and Advanced Design and Production Technologies (ADAPT). FIRP projects include the purchase and installation of new building dehumidification units that, in turn, support the disassembly and study of weapon components (stockpile evaluation). In addition, FIRP is replacing deteriorated natural gas lines supplying stockpile maintenance activities. Significant investments have also been made in roof repairs that are tied to ongoing production activities (joint test assemblies, component dismantling activities, and refurbishments of nuclear weapon systems) and in replacing two 1940-vintage transformers that were a weak link in the electrical distribution system supporting these mission activities. The key for each of these projects is their direct link to the NNSA Stockpile Stewardship Program. Y-12 has made significant and impressive progress in the demolition of excess facilities and has demolished over 400,000 gross square feet of facilities no longer needed.

Y-12 is also starting the planning and execution of five Line Item projects that address the most demanding utility issues at Y-12 [Compressed Air Upgrade (design start in FY 2004; construction in FY 2005), Steam Plant Life Extension (design start in FY 2005), potable water, electrical distribution, and utility distribution systems) and represent an investment of about $150 m over the next 7 years. FIRP also has initiated the complex-wide Roof Asset Management Program (RAMP) to establish and implement a corporate approach for the management of NNSA's roofing assets, which is expected to result in improved cost efficiencies, improved quality of life extension of NNSA's roofing assets, consistent approach and common standards for optimal roofing repairs and replacement, and additional deferred maintenance reduction.

Safeguards and Security
The plant has developed a Design Basis Threat (DBT) Implementation Plan to address new DBT protection requirements. In FY 2005-2009, Y-12 Plant will hire additional Security Police Officers. In FY 2005, the plant will begin a two-year effort that provides centralized computer management to control the use and application of personnel computers through a master network.

As part of the National Threat Level Alert System, the plant may occasionally have to implement additional compensatory security measures. These periods of heightened security require an increased expenditure of funds and use of resources.

DEFENSE NUCLEAR NONPROLIFERATION
Fissile Materials Disposition
Y-12 serves as the lead for all surplus highly enriched uranium (HEU) disposition activities through the HEU Disposition Program Office. Y-12 is also providing storage for surplus HEU pending disposition via shipment to the U.S. Enrichment Corporation/ Tennessee Valley Authority (USEC/TVA).

General Provisions

Proposed Appropriation Language

SEC. 301. (a) None of the funds appropriated by this Act may be used to award a management and operating contract, or award a significant extension or expansion to an existing management and operating contract, unless such contract is awarded using competitive procedures or the Secretary of Energy grants, on a case-by-case basis, a waiver to allow for such a deviation. The Secretary may not delegate the authority to grant such a waiver.
(b) At least 60 days before a contract award for which the Secretary intends to grant such a waiver, the Secretary shall submit to the Subcommittees on Energy and Water Development of the Committees on Appropriations of the House of Representatives and the Senate a report notifying the Subcommittees of the waiver and setting forth, in specificity, the substantive reasons why the Secretary believes the requirement for competition should be waived for this particular award.

SEC. 302. None of the funds appropriated by this Act may be used to—
(1) develop or implement a workforce restructuring plan that covers employees of the Department of Energy; or
(2) provide enhanced severance payments or other benefits for employees of the Department of Energy, under section 3161 of the National Defense Authorization Act for Fiscal Year 1993 (Public Law 102–484; 42 U.S.C. 7274h).

SEC. 303. None of the funds appropriated by this Act may be used to prepare or initiate Requests For Proposals (RFPs) for a program if the program has not been funded by Congress.

(Transfers of Unexpended Balances)

SEC. 304. The unexpended balances of prior appropriations provided for activities in this Act may be transferred to appropriation accounts for such activities established pursuant to this title. Balances so transferred may be merged with funds in the applicable established accounts and thereafter may be accounted for as one fund for the same time period as originally enacted.

SEC. 305. None of the funds in this or any other Act for the Administrator of the Bonneville Power Administration may be used to enter into any agreement to perform energy efficiency services outside the legally defined Bonneville service territory, with the exception of services provided internationally, including services provided on a reimbursable basis, unless the Administrator certifies in advance that such services are not available from private sector businesses.

SEC. 306. When the Department of Energy makes a user facility available to universities and other potential users, or seeks input from universities and other potential users regarding significant *characteristics or equipment in a user facility or a proposed user facility, the Department shall ensure broad public notice of such availability or such need for input to universities and other potential users.*

For purposes of this section, the term ''user facility'' includes, but is not limited to:
(1) a user facility as described in section 2203(a)(2) of the Energy Policy Act of 1992 (42 U.S.C. 13503(a)(2));
(2) a National Nuclear Security Administration Defense Programs Technology Deployment Center/User Facility; and
(3) any other Departmental facility designated by the Department as a user facility.

SEC. 307. The Administrator of the National Nuclear Security Administration may authorize the plant manager of a covered nuclear weapons production plant to engage in research, development, and demonstration activities with respect to the engineering and manufacturing capabilities at such plant in order to maintain and enhance such capabilities at such plant: Provided, That of the amount allocated to a covered nuclear weapons production plant each fiscal year from amounts available to the Department of Energy for such fiscal year for national security programs, not more than an amount equal to 2 percent of such amount may be used for these activities: Provided further, That for purposes of this section, the term ''covered nuclear weapons production plant'' means the following:
(1) the Kansas City Plant, Kansas City, Missouri;
(2) the Y–12 Plant, Oak Ridge, Tennessee;
(3) the Pantex Plant, Amarillo, Texas;
(4) the Savannah River Plant, South Carolina; and
(5) the Nevada Test Site.

SEC. 308. Section 310 of the Energy and Water Development Appropriations Act, 2000 (Public Law 106–60), is hereby repealed.

SEC. 309. Funds appropriated by this or any other Act, or made available by the transfer of funds in this Act, for intelligence activities are deemed to be specifically authorized by the Congress for purposes of section 504 of the National Security Act of 1947 (50 U.S.C. 414) during fiscal year 2004 until the enactment of the Intelligence Authorization Act for fiscal year 2004.

Explanation of Change

Same language as in the FY 2004 Congressional Budget.