DOE/CF-0107
Volume 1

Department of Energy
FY 2016 Congressional Budget Request

National Nuclear Security Administration

Federal Salaries and Expenses
Weapons Activities
Defense Nuclear Nonproliferation
Naval Reactors

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FUNDING BY APPROPRIATION

(Discretionary dollars in thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015 $	FY 2016 vs. FY 2015 %
Department of Energy Budget by Appropriation						
Energy and Water Development, and Related Agencies						
Energy Programs						
Energy Efficiency and Renewable Energy	1,900,641	1,824,876	1,914,195	2,722,987	+808,792	+42.3%
Electricity Delivery and Energy Reliability	147,242	144,205	146,975	270,100	+123,125	+83.8%
Nuclear Energy	888,376	877,620	833,379	907,574	+74,195	+8.9%
Fossil Energy Programs						
Clean Coal Technology	0	0	-6,600	0	+6,600	+100.0%
Fossil Energy Research and Development	561,931	550,630	560,587	560,000	-587	-0.1%
Naval Petroleum and Oil Shale Reserves	19,999	22,457	19,950	17,500	-2,450	-12.3%
Elk Hills School Lands Fund	0	0	15,580	0	-15,580	-100.0%
Strategic Petroleum Reserve	189,360	189,360	200,000	257,000	+57,000	+28.5%
Northeast Home Heating Oil Reserve	8,000	8,000	1,600	7,600	+6,000	+375.0%
Total, Fossil Energy Programs	**779,290**	**770,447**	**791,117**	**842,100**	**+50,983**	**+6.4%**
Uranium Enrichment Decontamination and Decommissioning Fund	598,574	598,574	625,000	542,289	-82,711	-13.2%
Energy Information Administration	116,999	116,999	117,000	131,000	+14,000	+12.0%
Non-Defense Environmental Cleanup	231,741	231,782	246,000	220,185	-25,815	-10.5%
Science	5,066,372	5,131,038	5,067,738	5,339,794	+272,056	+5.4%
Advanced Research Projects Agency - Energy	280,000	280,000	279,982	325,000	+45,018	+16.1%
Departmental Administration	126,449	126,449	125,130	153,511	+28,381	+22.7%
Indian Energy Programs	0	0	0	20,000	+20,000	N/A
Office of the Inspector General	42,120	42,120	40,500	46,424	+5,924	+14.6%
Title 17 - Innovative Technology						
Loan Guarantee Program	20,000	7,857	17,000	0	-17,000	-100.0%
Advanced Technology Vehicles Manufacturing Loan Program	6,000	6,000	4,000	6,000	+2,000	+50.0%
Tribal Indian Energy Loan Guarantee Program	0	0	0	11,000	+11,000	N/A
Total, Energy Programs	**10,203,804**	**10,157,967**	**10,208,016**	**11,537,964**	**+1,329,948**	**+13.0%**
Atomic Energy Defense Activities						
National Nuclear Security Administration						
Weapons Activities	7,781,000	7,790,197	8,180,359	8,846,948	+666,589	+8.1%
Defense Nuclear Nonproliferation	1,954,000	1,941,983	1,615,248	1,940,302	+325,054	+20.1%
Naval Reactors	1,095,000	1,101,500	1,233,840	1,375,496	+141,656	+11.5%
Office of the Administrator	377,000	370,500	0	0	0	N/A
Federal Salaries and Expenses	0	0	369,587	402,654	+33,067	+8.9%
Total, National Nuclear Security Administration	**11,207,000**	**11,204,180**	**11,399,034**	**12,565,400**	**+1,166,366**	**+10.2%**
Environmental and Other Defense Activities						
Defense Environmental Cleanup	5,000,000	4,999,293	5,453,017	5,527,347	+74,330	+1.4%
Other Defense Activities	755,000	755,000	753,449	774,425	+20,976	+2.8%
Total, Environmental and Other Defense Activities	**5,755,000**	**5,754,293**	**6,206,466**	**6,301,772**	**+95,306**	**+1.5%**
Total, Atomic Energy Defense Activities	**16,962,000**	**16,958,473**	**17,605,500**	**18,867,172**	**+1,261,672**	**+7.2%**
Power Marketing Administrations						
Southeastern Power Administration	0	0	0	0	0	N/A
Southwestern Power Administration	11,892	11,892	11,400	11,400	0	0
Western Area Power Administration	95,930	95,930	91,740	93,372	+1,632	+1.8%
Falcon and Amistad Operating and Maintenance Fund	420	420	228	228	0	0
Colorado River Basins Power Marketing Fund	-23,000	-23,000	-23,000	-23,000	0	0
Total, Power Marketing Administrations	**85,242**	**85,242**	**80,368**	**82,000**	**+1,632**	**+2.0%**
Federal Energy Regulatory Commission	0	0	0	0	0	N/A
Subtotal, Energy and Water Development and Related Agencies	**27,251,046**	**27,201,682**	**27,893,884**	**30,487,136**	**+2,593,252**	**+9.3%**
Uranium Enrichment Decontamination and Decommissioning Fund						
Discretionary Payments	0	0	-463,000	-471,797	-8,797	-1.9%
Excess Fees and Recoveries, FERC	-26,236	-19,686	-28,485	-23,587	+4,898	+17.2%
Title XVII Loan Guarantee Program Section 1703 Negative Credit Subsidy Receipt	0	0	0	-68,000	-68,000	N/A
Total, Discretionary Funding by Appropriation	**27,224,810**	**27,181,996**	**27,402,399**	**29,923,752**	**+2,521,353**	**+9.2%**

National Nuclear Security Administration

Overview*

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015 $	FY 2016 vs. FY 2015 %
National Nuclear Security Administration						
Office of the Administrator	377,000	370,500	0	0	0	0.0%
Federal Salaries and Expenses	0	0	370,000	402,654	32,654	+8.8%
Weapons Activities	7,845,000	7,854,197	8,231,770	8,846,948	+615,178	+7.5%
Defense Nuclear Nonproliferation	1,954,000	1,941,983	1,641,369	1,940,302	+298,933	+18.2%
Naval Reactors	1,095,000	1,101,500	1,238,500	1,375,496	136,996	+11.1%
Total, NNSA Program	**11,271,000**	**11,268,180**	**11,481,639**	**12,565,400**	**+1,083,761**	**+9.4%**
Rescission of Prior Year Balances	-64,000	-64,000	-82,605	0	82,605	-100.0%
Total NNSA, Net of Rescissions	**11,207,000**	**11,204,180**	**11,399,034**	**12,565,400**	**1,166,366**	+10.2%

* The FY 2014 appropriation included a one-time rescission of prior year balances of $64,000,000 for Weapons Activities. The Consolidated and Further Continuing Appropriations Act, 2015, includes one-time rescissions of prior year balances as follows: $413,000 for Federal Salaries and Expenses, $51,411,000 for Weapons Activities, $26,121,000 for Defense Nuclear Nonproliferation, and $4,660,000 for Naval Reactors.

Overview

The FY 2016 Request is $12.6 billion, an increase of $1.1 billion (9.4 percent) above the FY 2015 enacted levels. [a] This level of funding is required to maintain and modernize the U.S. nuclear stockpile through timely execution of approved life extension programs and modernize its supporting infrastructure as the United States diminishes the stockpile size; execute the international nuclear nonproliferation agenda, including efforts to prevent nuclear weapons-usable materials from falling into the wrong hands; and provide safe and effective integrated nuclear propulsion systems to the U.S. Navy. The request supports a more agile and efficient governance model for the nuclear security enterprise with a focus on clearly articulating NNSA policies and plans, better alignment of project management responsibilities to improve accountability, and providing accountable leadership and management at all levels.

The FY 2016 Request includes a number of budget structure changes which are reflected in the detailed program Budget Justification sections. For example, NNSA is proposing to move counterterrorism efforts from the Weapons Activities to Defense Nuclear Nonproliferation appropriation accounts, making the "comparable" increase in the Weapons Activities 10.5 percent and the "comparable" increase the Defense Nuclear Nonproliferation 4.0 percent. Other budget structure changes are proposed within the same Treasury Appropriations accounts.

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 enacted level exclusive of rescission.

NNSA Future-Years Nuclear Security Program[a]

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
National Nuclear Security Administration				
Federal Salaries and Expenses	410,393	418,406	428,260	437,326
Weapons Activities	9,282,292	9,484,527	9,717,748	9,829,656
Defense Nuclear Nonproliferation	1,943,195	1,975,316	1,982,605	2,021,701
Naval Reactors	1,435,120	1,467,751	1,778,387	1,778,317
Total, National Nuclear Security Administation	**13,071,000**	**13,346,000**	**13,907,000**	**14,067,000**

Public Law Authorizations

- P.L. 106-65, National Nuclear Security Administration Act, as amended
- P.L. 113-176, National Defense Authorization Act for Fiscal Year 2015

[a] The annual totals include an allocation to NNSA from the Department of Defense's five year budget plan. The amounts included are $1.60 billion in FY 2017, $1.66 billion in FY 2018, $1.70 billion in FY 2019, and $1.73 billion in FY 2020.

Appropriation Summary by Program[a]

(dollars in thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Office of the Administrator	377,000	370,500	0	0	0
Federal Salaries and Expenses					
Program Direction	0	0	370,000	402,654	32,654
Total, Federal Salaries and Expenses	0	0	370,000	402,654	32,654
Weapons Activities Appropriation					
Directed Stockpile Work	2,442,033	2,429,529	2,692,588	3,187,259	494,671
Science	369,723	368,614	412,091	389,614	-22,477
Engineering	149,911	149,598	136,005	131,377	-4,628
Inertial Confinement Fusion Ignition and High Yield	513,957	512,394	512,895	502,450	-10,445
Advanced Simulation and Computing	569,329	568,633	598,000	623,006	25,006
Advanced Manufacturing Development	0	0	107,200	130,056	22,856
Readiness Campaign	55,407	55,205	0	0	0
Readiness in Technical Base and Facilities	2,067,425	2,060,379	2,033,400	1,054,481	-978,919
Secure Transportation Asset	210,000	210,000	219,000	251,610	32,610
Nuclear Counterterrorism Incident Response	228,243	228,521	177,940	0	-177,940
Counterterrorism and Counterproliferation Programs	0	0	46,093	0	-46,093
Infrastructure and Safety	0	0	0	1,466,134	1,466,134
Site Stewardship	87,326	86,925	76,531	36,595	-39,936
Defense Nuclear Security	664,981	659,143	636,123	632,891	-3,232
Information Technology and Cybersecurity	145,068	144,442	179,646	157,588	-22,058
Legacy Contractor Pensions	279,597	335,490	307,058	283,887	-23,171
Domestic Uranium Enrichment (DUE) Research, Development and Demonstration	62,000	105,952	97,200	0	-97,200
Use of Prior Year Balances	0	-60,628	0	0	0
Total, Weapons Activities	7,845,000	7,854,197	8,231,770	8,846,948	615,178
Defense Nuclear Nonproliferation Appropriation					
Defense Nuclear Nonproliferation Programs					
Global Material Security	0	0	0	426,751	426,751
Material Management and Minimization	0	0	0	311,584	311,584
Nonproliferation and Arms Control	0	0	0	126,703	126,703
Defense Nuclear Nonproliferation R&D	0	0	393,401	419,333	25,932
Nonproliferation and Verification R&D	398,838	461,125	0	0	0
Nonproliferation Construction	0	0	0	345,000	345,000
Global Threat Reduction Initiative	442,102	444,598	325,752	0	-325,752
Nonproliferation and International Security	128,675	135,481	141,359	0	-141,359
International Material Protection & Cooperation	419,625	415,091	270,911	0	-270,911
Fissile Materials Disposition	526,057	585,300	430,000	0	-430,000
Total, Defense Nuclear Nonproliferation Programs	1,915,297	2,041,595	1,561,423	1,629,371	67,948
Nuclear Counterterrorism and Incident Response Program	0	0	0	234,390	234,390
Legacy Contractor Pensions	93,703	116,556	102,909	94,617	-8,292
Use of Prior Year Balances	-55,000	-216,168	-22,963	-18,076	4,887
Total, Defense Nuclear Nonproliferation Appropriation	1,954,000	1,941,983	1,641,369	1,940,302	298,933
Naval Reactors					
Naval Reactors	1,108,983	1,115,483	1,238,500	1,375,496	136,996
Use of Prior Year Balances	-13,983	-13,983	0	0	0
Total, Naval Reactors	1,095,000	1,101,500	1,238,500	1,375,496	136,996
Total, NNSA Program	11,271,000	11,268,180	11,481,639	12,565,400	1,083,761
Prior Year Balance Rescission (Federal Salaries & Expenses)	0	0	-413	0	413
Prior Year Balance Rescission (Weapons Activities)	-64,000	-64,000	-51,411	0	51,411
Prior Year Balance Rescission (Defense Nuclear Nonproliferation)	0	0	-26,121	0	26,121
Prior Year Balance Rescission (Naval Reactors)	0	0	-4,660	0	4,660
Total, NNSA Appropriations Net Rescissions	11,207,000	11,204,180	11,399,034	12,565,400	1,166,366

[a] This table shows FY 2015 Enacted levels as enacted in FY 2015 appropriations bill. The "Comparable" table on next page reflects FY 2015 Enacted levels as if it was enacted in the budget structure NNSA is proposing in FY 2016.

Appropriation Summary by Program [a]
(Comparable)

(dollars in thousands)

	FY 2014 Enacted Comparable	FY 2014 Current Comparable	FY 2015 Enacted Comparable	FY 2016 Request	FY 2016 vs FY 2015
Federal Salaries and Expenses					
Program Direction	377,000	370,500	370,000	402,654	32,654
Total, Federal Salaries and Expenses	377,000	370,500	370,000	402,654	32,654
Weapons Activities Appropriation					
Directed Stockpile Work	2,510,633	2,542,081	2,797,188	3,187,259	390,071
Science	369,723	368,614	412,091	389,614	-22,477
Engineering	149,911	149,598	136,005	131,377	-4,628
Inertial Confinement Fusion Ignition and High Yield	513,957	512,394	512,895	502,450	-10,445
Advanced Simulation and Computing	569,329	568,633	598,000	623,006	25,006
Advanced Manufacturing Development	57,807	57,605	107,200	130,056	22,856
Readiness in Technical Base and Facilities	643,879	636,386	687,959	1,054,481	366,522
Secure Transportation Asset	210,000	210,000	219,000	251,610	32,610
Infrastructure and Safety	1,465,547	1,465,784	1,386,741	1,466,134	79,393
Site Stewardship	36,325	36,134	27,831	36,595	8,764
Defense Nuclear Security	664,981	659,143	636,123	632,891	-3,232
Information Technology and Cybersecurity	145,068	144,442	179,646	157,588	-22,058
Legacy Contractor Pensions	279,597	335,490	307,058	283,887	-23,171
Use of Prior Year Balances	0	-60,628	0	0	0
Total, Weapons Activities	7,616,757	7,625,676	8,007,737	8,846,948	839,211
Defense Nuclear Nonproliferation Appropriation					
Defense Nuclear Nonproliferation Programs					
Global Material Security	572,358	571,646	424,244	426,751	2,507
Material Management and Minimization	422,159	421,565	272,919	311,584	38,665
Nonproliferation and Arms Control	118,442	124,516	125,859	126,703	844
Defense Nuclear Nonproliferation R&D	398,838	461,125	393,401	419,333	25,932
Nonproliferation Construction	403,500	462,743	345,000	345,000	0
Total, Defense Nuclear Nonproliferation Programs	1,915,297	2,041,595	1,561,423	1,629,371	67,948
Nuclear Counterterrorism and Incident Response Program	228,243	228,521	224,033	234,390	10,357
Legacy Contractor Pensions	93,703	116,556	102,909	94,617	-8,292
Use of Prior Year Balances	-55,000	-216,168	-22,963	-18,076	4,887
Total, Defense Nuclear Nonproliferation Appropriation	2,182,243	2,170,504	1,865,402	1,940,302	74,900
Naval Reactors					
Naval Reactors	1,108,983	1,115,483	1,238,500	1,375,496	136,996
Use of Prior Year Balances	-13,983	-13,983	0	0	0
Total, Naval Reactors	1,095,000	1,101,500	1,238,500	1,375,496	136,996
Total, NNSA Program	11,271,000	11,268,180	11,481,639	12,565,400	1,083,761
Prior Year Balance Rescission (Federal Salaries & Expenses)	0	0	-413	0	413
Prior Year Balance Rescission (Weapons Activities)	-64,000	-64,000	-51,411	0	51,411
Prior Year Balance Rescission (Defense Nuclear Nonproliferation)	0	0	-26,121	0	26,121
Prior Year Balance Rescission (Naval Reactors)	0	0	-4,660	0	4,660
Total, NNSA Appropriations Net Rescissions	11,207,000	11,204,180	11,399,034	12,565,400	1,166,366

[a] This "Comparable" table shows FY 2015 Enacted levels as if it was enacted in the budget structure NNSA is proposing in FY 2016. The table on the prior page shows FY 2015 Enacted levels as enacted in FY 2015 appropriations bill.

Outyear Appropriation Summary by Program [a]

(dollars in thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Federal Salaries and Expenses				
Program Direction	410,393	418,406	428,260	437,326
Total, Federal Salaries and Expenses	410,393	418,406	428,260	437,326
Weapons Activities Appropriation				
Directed Stockpile Work	3,321,991	3,616,882	3,688,969	3,740,814
Science	436,565	485,922	496,189	506,659
Engineering	120,487	138,718	140,829	141,299
Inertial Confinement Fusion Ignition and High Yield	525,410	546,051	557,573	569,337
Advanced Simulation and Computing	636,151	649,573	663,279	677,274
Advanced Manufacturing Development	106,272	79,236	90,967	92,701
Readiness in Technical Base and Facilities	1,121,378	1,207,290	1,285,038	1,235,439
Secure Transportation Asset	266,415	273,368	278,792	284,324
Infrastructure and Safety	1,702,463	1,477,855	1,559,208	1,607,043
Site Stewardship	36,760	37,015	37,701	38,395
Defense Nuclear Security	646,876	658,806	669,815	682,974
Information Technology and Cybersecurity	155,032	156,751	161,984	165,993
Legacy Contractor Pensions	206,492	157,060	87,404	87,404
Total, Weapons Activities	9,282,292	9,484,527	9,717,748	9,829,656
Defense Nuclear Nonproliferation Appropriation				
Defense Nuclear Nonproliferation Programs				
Global Material Security	534,263	543,665	552,122	580,363
Material Management and Minimization	315,463	337,593	348,494	344,490
Nonproliferation and Arms Control	131,305	140,726	144,033	146,909
Defense Nuclear Nonproliferation R&D	430,202	440,174	448,047	456,583
Nonproliferation Construction	221,000	221,000	221,000	221,000
Total, Defense Nuclear Nonproliferation Programs	1,632,233	1,683,158	1,713,696	1,749,345
Nuclear Counterterrorism and Incident Response Program	241,754	239,518	239,613	243,060
Legacy Contractor Pensions	69,208	52,640	29,296	29,296
Total, Defense Nuclear Nonproliferation Appropriation	1,943,195	1,975,316	1,982,605	2,021,701
Naval Reactors				
Naval Reactors	1,435,120	1,467,751	1,778,387	1,778,317
Total, Naval Reactors	1,435,120	1,467,751	1,778,387	1,778,317
Total, NNSA Program	13,071,000	13,346,000	13,907,000	14,067,000

[a] The annual totals include an allocation to NNSA from the Department of Defense's five year budget plan. The amounts included are $1.60 billion in FY 2017, $1.66 billion in FY 2018, $1.70 billion in FY 2019, and $1.73 billion in FY 2020.

Overview

The $12.6 billion FY 2016 Request provides funding for NNSA to implement four major national security endeavors consistent with the Department of Energy's (DOE) Strategic Plan: (1) use science to maintain a safe, secure, and effective nuclear weapons stockpile that deters any adversary and protects our allies; (2) reduce the threat posed by nuclear proliferation and terrorism, including unsecured or excess nuclear and radiological materials both domestically and internationally; (3) prepare to respond to, and mitigate, nuclear and radiological incidents worldwide; and (4) provide safe and effective integrated nuclear propulsion for the U.S. Navy.

The FY 2016 Budget Request also supports national security priorities articulated in the 2010 Nuclear Posture Review (NPR), the Stockpile Stewardship and Management Plan (SSMP), and the 2010 National Security Strategy of the United States. These priorities are reflected in the DOE Strategic Plan for 2014-2018 and guide decisions on allocation of resources in the President's Budget Requests.

FY 2016 Budget Request for **Weapons Activities (WA)** is $8.8 billion, an $839 million (10.5 percent) increase from the comparable FY 2015 enacted level, after adjusting for a budget structure change moving counterterrorism efforts from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation. This level of funding is needed to meet the Administration's commitments to maintain a safe, secure, and effective nuclear stockpile. Funding is also required to support the execution of the Nuclear Weapons Council (NWC) approved "3+2" strategy to consolidate the stockpile to three ballistic missile warheads and two air delivered systems. In addition, an increase in investment is needed to arrest the growth in deferred maintenance at NNSA's aging facilities and infrastructure. Finally, the request also reflects significant increases in our investment in critical plutonium capabilities and continues funding to consider a path forward for a domestic uranium enrichment source for tritium-production capabilities while reducing our investments in Research, Development, Test, and Evaluation activities.

The WA appropriation supports DOE's pursuit of its Strategic Plan goal of Nuclear Security, playing a critical role in meeting DOE's Strategic Objectives 4 and 5 to maintain the safety, security and effectiveness of the nation's nuclear deterrent without nuclear testing; and strengthen key science, technology, and engineering capabilities and modernize the national security infrastructure. The WA request also includes funding for Defense Nuclear Security (DNS) to support DOE's physical security reform efforts to emphasize mission performance, responsibility, and accountability. In addition, within the Directed Stockpile Work program, the request includes funding to consider a path forward for a domestic enriched uranium capability, and to provide low enriched uranium without peaceful use restrictions to support the current level of service but; the ultimate pathway to ensure an enduring capability has not been determined. The Budget request is closely aligned with the Department of Defense (DoD) requirements to ensure the U.S. nuclear deterrent continues to be safe, secure, and effective. The programs of the Weapons Activities appropriation are conducted primarily at eight sites by a workforce of approximately 30,000 people managed by a Federal workforce composed of civilian and military staffs.

The **Defense Nuclear Nonproliferation** (DNN) FY 2016 Budget Request is $1.9 billion, a $75 million (4.0 percent) increase from the comparable FY 2015 enacted level, after adjusting for a budget structure change moving counterterrorism efforts from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation. This level of funding is required to support U.S. leadership in nonproliferation initiatives both here and abroad. The DNN appropriation supports DOE's pursuit of its Strategic Plan goal of Nuclear Security, playing a critical role in meeting DOE's Strategic Objective 6 to reduce global nuclear security threats. After the conclusion of the four-year effort to secure nuclear materials that President Obama announced in 2009, emphasis continues to be on efforts to secure or eliminate the world's most vulnerable nuclear weapon materials; dispose of excess nuclear weapon materials in the U.S.; support the development of new technologies for nonproliferation; promote the secure expansion of nuclear energy; and improve capabilities worldwide to deter and detect the illicit movement of nuclear and radiological materials.

The U.S. remains committed to the plutonium disposition mission and to the Plutonium Management and Disposition Agreement (PMDA) with Russia. The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the PMDA. The

Department has requested Aerospace Corporation, a federally funded research and development facility, to perform these analyses. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition. The request acknowledges that while the Department continues to evaluate disposition paths (including the Mixed Oxide Fuel Fabrication Facility) to determine the most responsible path forward, any viable alternative will require a robust funding profile.

Funding is also requested in this account to sustain emergency response and nuclear counterterrorism capabilities that are applied against a wide range of high-consequence nuclear or radiological incidents and threats.

The **Naval Reactors (NR)** FY 2016 Budget Request is $1.4 billion, a $137 million (11.1 percent) increase from the FY 2015 enacted levels. The NR appropriation supports DOE's pursuit of its Strategic Plan goal of Nuclear Security, playing a critical role in meeting DOE's Strategic Objective 7 to provide safe and effective integrated nuclear propulsion systems for the U.S. Navy. This funding is needed for operations and infrastructure and development in support of the Navy's fleet of nuclear-powered aircraft carriers and submarines and funds three major DOE initiatives – the *Ohio*-Class Replacement Reactor System Development, Land-based S8G Prototype Refueling Overhaul, and Spent Fuel Handling Recapitalization Project. This funding also provides for Naval Reactors' Federal program direction activities.

The FY 2016 budget Request for **NNSA Federal Salaries and Expenses (FSE)**, is $402.7 million for Federal staffing and support expenses needed to meet mission requirements, an 8.8 percent increase above FY 2015 enacted levels and a 2.0 precent reduction from the President's FY 2015 Budget request. The FY 2015 enacted appropriation reflects a reduction of $40.8 million from the FY 2015 President's Request. In FY 2015, unobligated carryover from FY 2014 was sufficient to offset this reduction and NNSA does not plan on having such high levels of unobligated balances carried over into FY 2016. As such, the FY 2016 request reflects an increase of $1.5 million from actual planned execution in FY 2015. NNSA is requesting funding for 1,690 full-time equivalents (FTEs), in accordance with Section 3116 of the FY 2015 National Defense Authorization Act. Funding is requested to pay for projected required cost of living adjustments and benefit escalation.

Highlights and Major Changes in the FY 2016 Budget

Weapons Activities

The WA request for FY 2016 builds upon last year's NWC-approved Deputy Secretary's Management Action Group option 1 (DMAG-1) to meet the key NPR goals to modernize the stockpile through timely execution of approved life extension programs and modernize the enterprise infrastructure within current fiscal constraints. Programs funded within the WA appropriation support the Nation's current and future defense posture, and its attendant nationwide infrastructure of science, technology, and engineering capabilities. WA provides for the maintenance and refurbishment of nuclear weapons to sustain confidence in their safety, reliability, and performance; expansion of scientific, engineering, and manufacturing capabilities to enable certification of the enduring nuclear weapons stockpile; and manufacture of nuclear weapon components. This account provides for continued maintenance and investment in the NNSA nuclear enterprise to be more responsive and cost effective. WA also provides protection for NNSA personnel, facilities, nuclear weapons, special nuclear material, and information from a full spectrum of insider and outsider threats.

The major elements of the FY 2016 - 2020 request include:

- Accomplish all required stockpile maintenance activities to sustain the existing stockpile.
- Execute the NWC-approved life extension programs (LEP), including the B61-12, with completion of a B61-12 first production unit no later than the second-quarter of FY 2020.
- Complete production of the W76-1 warhead by FY 2019.
- Complete a W88 arming, fuzing, and firing (AF&F) first production unit in the first-quarter of FY 2020.
- Continue the W80-4 LEP, previously titled Cruise Missile Warhead LEP, with an adjusted FY 2025 first production unit in support of the Air Force Long Range Stand Off (LRSO) program.
- Execute a plutonium strategy that achieves a 30 pit per year (ppy) capacity by 2026 and demonstrates, for a pilot period, a 50-80 ppy capacity from FY 2027-2029.
- Execute a new uranium strategy to ensure the long term viability of uranium manufacturing capabilities and processes through a combination of risk reduction, recapitalization of existing infrastructure, and new facilities.
- Execute RDT&E activities that both support the priorities listed above and sustain the associated workforce.
- Maintain a risk-based security program and collaboration with the DoD, in support of nuclear security enterprise goals.

- Transform the computing environment by delivering the NNSA Network Vision (2NV) and the Joint Cyber Security Coordination Center (JC3).
- Provide additional protective force Full Time Equivalents (FTEs) to reduce the need for overtime and address aging infrastructure and obsolescence of physical security systems components.
- Improve facility maintenance activities and reinvestment projects to arrest growth in deferred maintenance.
- Continues on schedule to dismantle by FY 2022 all weapons retired from the stockpile prior to FY 2009.

The WA account includes a number of proposed budget structure changes that will improve the management and execution of WA programs. The first is the creation of a Nuclear Material Commodities program within Directed Stockpile Work, to recognize the investment needed in nuclear material to maintain the viability of the enduring stockpile. Second, NNSA has created the Research, Development, Test and Evaluation program, including an Advanced Manufacturing Development component within the program in accordance with the Consolidated and Further Continuing Appropriations Act, 2015. Simultaneously, NNSA has eliminated Campaigns. Third, certain activities formerly performed under the Readiness in Technical Base and Facilities (RTBF) and Site Stewardship programs have been consolidated in a new Infrastructure and Safety program. Fourth, while not a budget structure change, the FY 2016 Request does incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract for estimates for the Pantex and Y-12 sites. Finally, as noted earlier, NNSA has moved counterterrorism programs out of WA into DNN.

Defense Nuclear Nonproliferation

The FY 2016 request includes a number of budget structure changes that will improve the management and execution of DNN programs. The FY 2016 Budget Request proposes the transfer of the Nuclear Counterterrorism Incident Response (NCTIR) and the Counterterrorism and Counterproliferation (CTCP) Programs from the Weapons Activities to the Defense Nuclear Nonproliferation (DNN) appropriation. Further, the Request proposes to combine the NCTIR and CTCP programs to eliminate confusion about NNSA nuclear counterterrorism programs and activities, and to change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program. These transfers align all NNSA funding to prevent, counter, and respond to nuclear proliferation and terrorism in one appropriation. The DNN Appropriation will support two enduring mission areas: 1) Defense Nuclear Nonproliferation and 2) Nuclear Counterterrorism and Incident Response (NCTIR).

To achieve these nuclear security and organizational strategic objectives, NNSA proposes to restructure the budgets under the Defense Nuclear Nonproliferation Appropriation as follows: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, Defense Nuclear Nonproliferation R&D, and the Nuclear Counterterrorism and Incident Response Program. These six programs support the following five major mission functions to: 1) prevent the spread of materials, technology, and expertise relating to weapons of mass destruction (WMD); 2) advance the technologies to detect the proliferation of WMD worldwide; 3) eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons; 4) respond to nuclear or radiological incidents worldwide; and 5) sustain counterterrorism capabilities through innovative technology and policy-driven solutions. DOE/NNSA also works to strengthen regulatory, safety, security, and safeguards infrastructure in countries new to nuclear power and provide technical support, analytical support, and capability development for meeting and monitoring compliance with nuclear nonproliferation and arms control treaties.

The major elements of the FY 2016 - 2020 request include:

- Sustains activities in plutonium disposition, including $345 million in funding for the Mixed Oxide (MOX) Fuel Fabrication Facility, which is the current services projection from the FY 2015 enacted level.
- Continues remaining high-priority nuclear and radiological threat reduction efforts, following the accelerated four year effort activities.
- Provides the International Atomic Energy Agency (IAEA) with critical mission support and strengthens international nuclear safeguards system.
- Provides funding to address urgent emerging threats in unstable regions, particularly the Middle East.
- Advances satellite payload activities that support treaty monitoring and military missions.
- Sustains radiological/nuclear device stabilization capabilities in nine cities, including providing technical equipment and training.
- Continues Emergency Communications Network Suite upgrades to maintain state of art capabilities.

Naval Reactors

Naval Reactors' (NR) FY 2016 Request continues achievement of NR's core objective of ensuring the safe and reliable operation of the Nation's nuclear fleet (73 submarines, 10 aircraft carriers, and 4 research, development, and training platforms), constituting over 45 percent of the Navy's major combatants. This Budget Request supports three major DOE initiatives: *Ohio*-Class Replacement Reactor System Development, Land-based S8G Prototype Refueling Overhaul, and Spent Fuel Handling Recapitalization Project. Funding is also requested for Naval Reactors Federal program direction activities.

NNSA Federal Salaries and Expenses

The FY 2016 Request builds upon on-going efforts to improve the effectiveness and efficiency of NNSA federal oversight and to meet current and future workforce needs. For example, the FY 2014 National Defense Authorization Act (NDAA) directed the NNSA to establish an office of Cost Estimating and Program Evaluation (CEPE). NNSA is currently standing up the CEPE office, with initial staff being transferred from within NNSA; additional staff will be hired in FY 2015 and FY 2016.

The FY 2016 Budget request provides support for 1,690 FTEs and other expenses of the NNSA Federal staff. The request has been significantly downsized relative to prior Future Years Nuclear Security Programs (FYNSPs) consistent with NNSA's ongoing efforts to streamline operations and provide efficient and effective Federal oversight to our programs in close partnership with the national laboratories and production facilities.

Major Outyear Priorities and Assumptions

The total NNSA FYNSP for FY 2016 – 2020 is $67.0 billion, of which $12.6 billion is requested for FY 2016 and $54.4 billion is planned to be requested from FY 2017 – 2020. This FYNSP total is slightly higher than what was projected in last year's FY 2015 – 2019 FYNSP. This level of funding is required to support the major elements of FYNSP work outlined above. If funding in any year is lower, NNSA may be required to re-adjust projected timelines to complete mission work.

Department of Energy (DOE) Working Capital Fund (WCF) Support

NNSA's projected support to the DOE WCF for FY 2016 is $79.1 million, of which $41.4 million will be paid for out of FSE, $28.0 million out of WA, $6.1 million out of DNN, and $3.6 million out of NR. This is a $1.6 million (2.0 percent) decrease from FY 2015 primarily related to reductions in the CyberOne business line.

Legacy Contractor Pensions

NNSA requests $379 million in FY 2016 for Legacy Contractor Pensions split between Weapons Activities and Defense Nuclear Nonproliferation, $31.4 million less than the FY 2015 Budget request. This funding provides the annual NNSA share of the DOE's reimbursement of payments made to the University of California (UC) Retirement Plan (UCRP) for former UC employees and annuitants who worked at the Lawrence Livermore National Lab (LLNL) and Los Alamos National Lab (LANL). The UCRP benefit for these individuals is a legacy cost and DOE's annual payment to the UC is required by the contracts. The amount of the annual payment is based on the actuarial valuation report and is covered by the terms described in the contracts. Funding for these contracts will be paid through the Legacy Contractor Pension line item.

Cybersecurity Crosscut

The Department of Energy (DOE) is engaged in three categories of cyber-related activities: protecting the DOE enterprise from a range of cyber threats that can adversely impact mission capabilities; bolstering the U.S. Government's capabilities to address cyber threats; and, improving cybersecurity in the electric power subsector and the oil and natural gas subsector. The cybersecurity crosscut supports central coordination of the strategic and operational aspects of cybersecurity and facilitates cooperative efforts such as the Joint Cybersecurity Coordination Center (JC3) for incident response, Insider Threat program, and the implementation of Department-wide Identity Control and Access Management (ICAM).

Exascale Computing: Exascale systems are needed to support areas of research that are critical to national security objectives as well as applied research advances in areas such as climate models, combustion systems, and nuclear reactor design that are not within the capacities of today's systems. Exascale systems' computational power is needed for increasing capable data-analytic and data-intense applications across the entire Federal complex. Exascale is a component of long-term collaboration between the Office of Science's Advanced Scientific Computing Research program and the NNSA's Advanced Simulation and Computing (ASC) program.

NNSA Graduate Fellowship Program (NGFP) Support

The NNSA manages a technical fellowship program to cultivate the next generation of leaders in managing the nuclear stockpile, nonproliferation, nuclear security, and international security. This program will help foster the pipeline of highly qualified professionals who will sustain expertise in these areas through future employment within the nuclear security enterprise. NNSA anticipates spending about $6.5 million in FY 2016.

Indirect Costs and Other Items of Interest

General Plant Projects (GPP)

Pursuant to Section 3121 of the Ike Skelton National Defense Authorization Act for FY 2011 (P.L. 111-383), notification is being provided for general plant projects with a total estimated cost of more than $5 million planned for execution in FY 2015 and FY 2016.

FY 2015 General Plant Projects

Weapons Activities – Sandia National Laboratories

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
ABQ: Bldg. 870 Neutron Generator Production Facility - Refurbishments	NA-50	6,500,000	Project provides facility improvements to sustain support for neutron generator design, development, and production. This project sustains and upgrades electrical distribution systems, lighting, chillers, exhaust systems, and address other backbone utilities.	0	500,000	6,000,000	0	500,000
C914 Seismic Upgrades	NA-50	9,000,000	Decommission and replace aging Y-12 161kV Overhead Power Distribution lines, Static Overhead Wire Lighting Protection cable, Eight – 161kV to 13.8kV oil filled transformers, and the ELZA 1, 2, and 3	0	0	500,000	8,500,000	650,000
ABQ: Bldg. 827 Weapons Primary Standards Laboratory - Refurbishments	NA-50	9,000,000	This project provides facility-related improvements to sustain calibration capabilities. This project will provide repairs to facility's floor slabs, upgrades to the facility control system (FCS), and replacement of mechanical systems which are nearing the end of their design lives.	0	0	500,000	8,500,000	650,000
ABQ: Bldg. 862 Standby Power Plant - System Upgrade	NA-50	8,500,000	Replace and upgrade SNL's TA-I three diesel standby/ backup generators and transfer system to increase emergency power reliability and capacity.	0	0	3,000,000	5,500,000	650,000

Weapons Activities – NNSA Production Office

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Building 12-126 Electrical/ Mechanical Upgrade	NA-50	9,800,000	This project upgrades the electrical and mechanical systems to ensure power, generator, and Uninterrupted Power Supply (UPS) needs are met for additional upgrades and new technology implementations.	0	500,000	5,000,000	4,300,000	650,000
161 KV Power Distribution System	NA-50	6,500,000	Procure, install, and hook up to Y-12 13.8kV Distribution a new 161kV to 13.8kV Substation. Decommission and replace aging Y-12 161kV overhead power distribution lines, lightning protection cable, oil filled transformers, and the ELZA 1, 2, and 3.	0	1,000,000	5,500,000	0	500,000
Bld 92-2 Kathabar Replacement	NA-50	9,000,000	Replaces Kathabar dehumidification system. New unit to be constructed of fiberglass instead of metal that is suspect to corrosion properties of lithium chloride desiccant solution.	0	3,000,000	6,000,000	0	850,000

Institutional General Plant Projects (IGPP)

Pursuant to Section 3121 of the Ike Skelton National Defense Authorization Act for FY 2011 (P.L. 111-383), notification is being provided for general plant projects with a total estimated cost of more than $5 million planned for execution in FY 2015 and FY 2016.

FY 2015 Institutional General Plant Projects

Weapons Activities – Los Alamos National Laboratory

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
TA-48RC 45 Expansion		9,171,000	Construct new 10,000 Sq Ft facility adjacent to the existing plutonium bioassay TA-48 RC 45 facility. Capacity at current facility severely limited in meeting LANL bioassay analysis scope.	200,000	3,000,000	4,200,000	0	900,000
Fire Station 5 Replacement		9,156,000	Construct a new fire station to replace the 60 year old existing station at TA-16. The current structure and all major facility systems are beyond their designed life and no longer meet modern fire stations standards or can accommodate modern equipment.	0	1,500,000	4,500,000	2,300,000	750,000

General Plant Projects (GPP)

Pursuant to Section 3121 of the Ike Skelton National Defense Authorization Act for FY 2011 (P.L. 111-383), notification is being provided for general plant projects with a total estimated cost of more than $5 million planned for execution in FY 2015 and FY 2016.

FY 2016 General Plant Projects

Weapons Activities – Kansas City Plant

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Facility Modifications for Weapons Production	NA-50	8,000,000	This project is to build out a portion of the existing NSC "white space" at the NSC facility to support new program development and production work at KCP (B61 LEP, W88 ALT 370). This project will enable support for new and developing programs as they evolve and require KCP hardware.	0	0	8,000,000	0	500,000

Weapons Activities – Savannah River Site

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Reservoir Storage	NA-50	8,500,000	This project will establish a new vault type room (VTR) location for storage of returned reservoirs prior to unloading. The new VTR will be located in the hardened Tritium Extraction Facility (TEF) and will include upgraded, safety controls. Current operations require a reduced inventory due to safety basis changes.	0	0	2,600,000	5,900,000	800,000

Weapons Activities – Los Alamos National Laboratory

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Weather Enclosure At DARHT (Demolition & Construction)	NA-10	7,500,000	Construct a weather enclosure to provide a safe, productive environment for workers at DARHT.	0	0	1,000,000	6,500,000	759,000

Institutional General Plant Projects (IGPP)

Pursuant to Section 3121 of the Ike Skelton National Defense Authorization Act for FY 2011 (P.L. 111-383), notification is being provided for general plant projects with a total estimated cost of more than $5 million planned for execution in FY 2015 and FY 2016.

FY 2016 Institutional General Plant Projects

Weapons Activities – Lawrence Livermore National Laboratory

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Light Manufacturing Lab		9,500,000	Light Manufacturing Lab to provide additional lab space for various programs at LLNL. Currently undergoing scoping efforts.	0	0	3,000,000	6,500,000	500,000
Institutional Office Bldg		9,500,000	Building to provide office space for various programs at LLNL. Currently undergoing scoping efforts.	0	0	3,000,000	6,500,000	500,000

Weapons Activities – Sandia National Laboratories

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
ABQ: Explosives Activity Consolidation		5,700,000	This will affect various organizations that support explosives activities at Sandia National Laboratories and will result in the consolidation of activities currently spread out in several technical areas.	0	0	5,700,000	0	600,000

50 US Code 2746 requires that if the total estimated cost for construction design in connection with any construction project exceeds $1,000,000, funds for that design must be specifically authorized by law. NNSA requests Congressional Authorization for eight General Plant Projects exceeding the $1,000,000 design threshold for the following projects**:**

Weapons Activities – NNSA Production Office

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Vacuum Chamber Upgrades	NA-10	9,557,000	Provide facility modifications and equipment upgrades required to provide sufficient capacity in accordance with projected P&PD workloads.	0	7,000,000	0	0	1,500,000
Gas Lab Replacement	NA-50	9,800,000	Construct a new facility to replace the deteriorating and obsolete Gas Analysis Laboratory.	0	0	5,000,000	4,800,000	1,500,000

Weapons Activities – Savannah River Site

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
Replace Film Radiography in Finishing Gloveboxes	NA-12	6,500,000	Digital Radiography in Gloveboxes in HANM. Current film technology of reservoir pinch welds is obsolete.	0	0	3,000,000	3,500,000	1,600,000
Replace 234-7H Air Handling Units (AHU)	NA-50	8,650,000	This project will replace currently existing AHUs that supply 234-7H. It will require new ventilation fans and a high efficiency new chilled water system. This modification will replace undersized equipment in 234-7H and add capacity for planned additional cooling needs. (Part of TRIM Program)	4,390,000	2,200,000	2,060,000	0	1,700,000
FTS DAS Upgrade Project	NA-12	4,000,000	The Function Test Stations are the primary systems and equipment in Tritium Facilities	0	0	2,000,000	2,000,000	1,000,000

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
			for performing GTS Surveillance and support all LEP FPUs. The GTS reservoir assembly is functioned inside the FTS belljars and the data from the testing is reported to Design Agencies who then use the data reports to annually certify the weapons. The FTS Stations are outfitted with thousands of instruments that are monitored and controlled during the testing by a DAS (Data Acquisition System) basically a custom computer system. The DAS was designed and built in mid-1990's. The FTS Upgrades will replace all critical equipment and instrumentation that has been in continuous operations for 20 years. In recent years there have been an increasing number of component failures due to normal wear and aging effects.					

Weapons Activities – Los Alamos National Laboratory

Project Title	Program	TEC	Project Description	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	Outyears	Construction Design Estimate
HE Facilities Compliance Modernization	NA-50	6,770,000	Repair and upgrade facilities in the HE complex that are deficient, do not meet the current requirements, or have ESH&Q compliance issues. Correcting these deficiencies will improve the efficiency and quality of the operations in facilities in the complex.	0	0	700,000	6,070,000	1,450,000
Dynamic Equation of State Facility	NA-50	6,500,000	Construct a facility that consolidates LANL's dynamic high pressure tools supporting all tail number systems as well as future-enabling science.	0	0	6,500,000	0	1,000,000

General Plant Projects for NNSA

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
General Plant Projects					
Kansas City Plant	4,645	4,645	9,500	23,530	+14,030
Sandia National Laboratories	1,458	1,458	3,327	7,700	+4,373
Los Alamos National Laboratory	0	0	0	2,000	+2,000
Lawrence Livermore National Laboratory	0	0	9,650	9,600	-50
NNSA Production Office	21,109	21,109	38,324	17,588	-20,736
Savannah River Site	15,221	15,221	21,035	28,686	+7,651
Nevada National Security Site	4,220	4,220	4,100	23,100	+19,000
Bettis Atomic Power Laboratory	0	0	13,420	2,818	-10,602
Knolls Atomic Power Laboratory	2,900	2,900	11,280	5,882	-5,398
Total Site, GPP	**49,553**	**49,553**	**110,636**	**120,904**	**+10,268**

Outyears for NNSA

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
General Plant Projects				
Kansas City Plant	14,550	10,000	10,000	10,000
Sandia National Laboratories	39,650	34,350	37,300	18,600
Los Alamos National Laboratory	2,800	0	0	0
Lawrence Livermore National Laboratory	8,200	0	0	0
NNSA Production Office	6,788	7,500	5,500	2,000
Savannah River Site	31,933	23,283	29,200	21,950
Nevada National Security Site	10,058	19,400	9,100	0
Bettis Atomic Power Laboratory	7,900	7,115	26,300	9,430
Knolls Atomic Power Laboratory	14,801	19,291	25,899	13,470
Total Site, GPP	**136,680**	**120,939**	**143,299**	**75,450**

Institutional General Plant Projects for NNSA

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Institutional General Plant Projects					
Kansas City Plant	0	0	0	0	0
Sandia National Laboratories	4,020	4,020	30,023	19,229	-10,794
Los Alamos National Laboratory	0	0	0	0	0
Lawrence Livermore National Laboratory	4,935	4,935	4,392	915	-3,477
NNSA Production Office	0	0	0	0	0
Savannah River Site	0	0	0	0	0
Nevada National Security Site	0	0	0	0	0
Bettis Atomic Power Laboratory	0	0	0	0	0
Knolls Atomic Power Laboratory	0	0	0	0	0
Total Site, IGPP	**8,955**	**8,955**	**34,415**	**20,144**	**-14,271**

Outyears for NNSA

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Institutional General Plant Projects				
Kansas City Plant	0	0	0	0
Sandia National Laboratories	34,849	15,850	12,750	3,000
Los Alamos National Laboratory	0	0	0	0
Lawrence Livermore National Laboratory	915	915	915	915
NNSA Production Office	0	0	0	0
Savannah River Site	0	0	0	0
Nevada National Security Site	0	0	0	0
Bettis Atomic Power Laboratory	0	0	0	0
Knolls Atomic Power Laboratory	0	0	0	0
Total Site, IGPP	**35,764**	**16,765**	**13,665**	**3,915**

Facilities Maintenance and Repair for NNSA

The Department's Facilities Maintenance and Repair activities are tied to the programmatic missions, goals, and objectives. Facilities Maintenance and Repair activities funded by NNSA are displayed below:

Directed-Funded Maintenance and Repair

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Directed-Funded Maintenance and Repair					
Kansas City Plant	35,529	35,529	24,203	21,046	-3,157
Sandia National Laboratories	4,506	4,506	9,403	11,405	+2,002
Los Alamos National Laboratory	66,389	66,389	54,250	46,068	-8,182
Lawrence Livermore National Laboratory	17,410	17,410	14,355	15,000	+645
NNSA Production Office	100,739	100,739	92,186	103,440	+11,254
Savannah River Site	23,832	23,832	27,716	30,819	+3,103
Nevada National Security Site	19,791	19,791	43,515	56,560	+13,045
Bettis Atomic Power Laboratory	15,576	15,576	15,674	17,855	+2,181
Knolls Atomic Power Laboratory	7,663	7,663	7,673	7,258	-415
Total, Directed-Funded Maintenance and Repair	**291,435**	**291,435**	**288,975**	**309,451**	**+20,476**

Outyears for NNSA

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Directed-Funded Maintenance and Repair				
Kansas City Plant	23,160	22,800	24,000	24,200
Sandia National Laboratories	19,510	17,417	27,225	7,936
Los Alamos National Laboratory	46,598	47,903	50,638	51,651
Lawrence Livermore National Laboratory	15,700	15,700	15,700	15,700
NNSA Production Office	104,951	109,528	112,174	115,890
Savannah River Site	27,254	27,933	30,067	31,119
Nevada National Security Site	41,467	37,283	42,857	31,141
Bettis Atomic Power Laboratory	18,818	21,915	21,347	18,851
Knolls Atomic Power Laboratory	6,685	7,220	7,417	7,763
Total, Directed-Funded Maitenance and Repair	**304,143**	**307,699**	**331,425**	**304,251**

Indirect-Funded Maintenance and Repair

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Indirected-Funded Maitenance and Repair					
Kansas City Plant	0	0	0	0	0
Sandia National Laboratories	74,187	74,187	70,172	98,443	+28,271
Los Alamos National Laboratory	104,635	104,635	109,315	111,057	+1,742
Lawrence Livermore National Laboratory	104,457	104,457	102,525	106,266	+3,741
NNSA Production Office	35,659	35,659	49,770	31,946	-17,824
Savannah River Site	3,825	3,825	3,039	3,129	+90
Nevada National Security Site	51,358	51,358	53,424	54,439	+1,015
Bettis Atomic Power Laboratory	10,394	10,394	10,539	11,007	+468
Knolls Atomic Power Laboratory	15,757	15,757	15,599	19,087	+3,488
Total, Indirected-Funded Maitenance and Repair	**400,272**	**400,272**	**414,383**	**435,374**	**+20,991**

Outyears for NNSA

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Indirected-Funded Maitenance and Repair				
Kansas City Plant	0	0	0	0
Sandia National Laboratories	85,227	87,841	89,135	81,658
Los Alamos National Laboratory	112,834	114,647	116,496	118,382
Lawrence Livermore National Laboratory	102,527	101,900	101,914	102,843
NNSA Production Office	32,553	33,172	33,802	34,444
Savannah River Site	2,980	2,982	3,374	3,492
Nevada National Security Site	55,474	56,528	57,602	58,696
Bettis Atomic Power Laboratory	11,233	11,105	11,016	11,076
Knolls Atomic Power Laboratory	13,258	13,321	13,923	13,839
Total, Indirected-Funded Maitenance and Repair	**416,086**	**421,496**	**427,262**	**424,430**

Report on FY 2014 Expenditures for Maintenance and Repair

This report responds to legislative language set forth in Conference Report (H.R. Conf. Rep. No. 108-10) accompanying the Consolidated Appropriations Resolution, 2003 (Public Law 108-7) (pages 886-887), which requests the Department of Energy provide an annual year-end report on maintenance expenditures to the Committees on Appropriations. This report compares the actual maintenance expenditures in FY 2014 to the amount planned for FY 2014, including congressionally directed changes.

Total Costs for Maintenance and Repair

(Dollars in Thousands)

	FY 2014 Actual Cost	FY 2014 Planned Cost
Maintenance and Repair		
Kansas City Plant	35,529	36,015
Sandia National Laboratories	78,693	78,240
Los Alamos National Laboratory	171,024	184,342
Lawrence Livermore National Laboratory	121,867	118,385
NNSA Production Office	136,398	133,033
Savannah River Site	27,657	28,987
Nevada National Security Site	71,149	75,599
Bettis Atomic Power Laboratory	25,970	24,815
Knolls Atomic Power Laboratory	23420	22038
Total, Maintenance and Repair	691,707	701,454

Homeland Security/Safeguards and Security Crosscut

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	$ Chg.	% Chg.
Homeland Security Program Unique Elements						
Weapons Activities						
Nuclear Counterterrorism Incident Response [a]						
Emergency Response	143,748	142,989	142,577	0	(142,577)	-100.0%
National Technical Nuclear Forensics	11,000	11,648	10,250	0	(10,250)	-100.0%
Emergency Management	6,195	6,195	5,668	0	(5,668)	-100.0%
Operations Support	8,350	8,350	14,850	0	(14,850)	-100.0%
Nuclear Counterterrorism	51,950	51,950	-	0	-	
Subtotal, NCTIR	221,243	221,132	173,345	0	(173,345)	-100.0%
Counterrorism & Counterproliferation Programs [a]			46,093	0	(46,093)	-100.0%
Defense Nuclear Nonproliferation						
Nonproliferation and Verification R&D						
Proliferation Detection	50,000	50,000	50,000	50,000	-	0.0%
Subtotal, NN R&D	50,000	50,000	50,000	50,000	-	0.0%
Global Threat Reduction Initiative/Global Material Security [b]						
Domestic Radiological Material Removal	20,600	20,600	20,645	17,000	(3,645)	-17.7%
Domestic Material Protection	59,400	59,229	57,987	75,593	17,606	30.4%
Subtotal, GTRI	80,000	79,829	78,632	92,593	13,961	17.8%
DNN Nuclear Counterrorism Incident Response Program [a]						
Emergency Response				136,877	136,877	0.0%
National Technical Forensics				10,753	10,753	0.0%
Emergency Management and Operations Center				20,627	20,627	0.0%
Counterterrorism Response and Capacity Building				6,844	6,844	0.0%
Nuclear Counterterrorism Device Assessment				59,289	59,289	0.0%
Subtotal NCTIR				234,390	234,390	0.0%
Subtotal, HS Program Uniques Elements (Not S&S elements)	351,243	350,961	348,070	376,983	28,913	8.3%
Safeguards and Security Components of Homeland Security						
Weapons Activities						
Defense Nuclear Security						
Protective Forces	398,931	398,931	388,485	385,792	(2,693)	-0.7%
Physical Security Systems	85,934	85,934	79,866	75,205	(4,661)	-5.8%
Information Security	37,536	35,536	30,432	29,079	(1,353)	-4.4%
Personnel Security	34,810	34,810	34,151	32,487	(1,664)	-4.9%
Material Control and Accountability	29,962	29,962	28,678	23,739	(4,939)	-17.2%
Program Management/Security Program Operations & Planning	77,808	73,490	74,511	73,589	(922)	-1.2%
Construction		480	-	13,000	13,000	0.0%
Subtotal, Defense Nuclear Security	664,981	659,143	636,123	632,891	(3,232)	-0.5%
Secure Transportation Asset	210,000	210,000	219,000	251,610	32,610	14.89%
Information Technology and Cybersecurity [b]						
Cybersecurity						
Infrastructure Program	105,441	105,441	140,805	108,188	(32,617)	-23.2%
Technology Application Development	4,000	4,000	4,000	6,000	2,000	50.0%
Enterprise Secure Computing	10,000	10,000	10,000	18,400	8,400	84.0%
Federal Unclassified Information Technology (not Homeland)	[25,627]	[25,001]	[24,841]	[25,000]		
Subtotal, Information Technology Cyber Security	119,441	119,441	154,805	132,588	(22,217)	-14.4%
Working Capital Fund (CyberOne contribution) [c]	14,663	14,663	15,057	12,276	(2,781)	-18.5%
Subtotal, Safeguards and Security within Homeland Security	**1,009,085**	**1,003,247**	**1,024,985**	**1,029,365**	**4,380**	**0.4%**
Total, Homeland Security	**1,360,328**	**1,354,208**	**1,373,055**	**1,406,348**	**33,293**	**2.4%**
Security Investigations	27,000	27,000	30,000	33,000	3,000	10.0%
Total, Safeguards and Security (Inclusive of Security Investigations)	**1,036,085**	**1,030,247**	**1,054,985**	**1,062,365**	**7,380**	**0.7%**

[a] The Nuclear Counterterrorism and Incident Response Program requested under the DNN appropriation in FY 2016. Prior year funding was under Weapons Activities appropriation.

[b] Federal Unclassified Information Technology is not Homeland Security.

[c] CyberOne initiative is funded from direct program NNSA Weapons Activities, DNN, and NR, not Information Technology and Cybersecurity.

Site Estimates

(Dollars in Thousands)

Site	FY 2014 Current	FY 2015 Enacted	FY 2016 FSE	FY 2016 WA	FY 2016 NN	FY 2016 NR	FY 2016 Total
Argonne National Laboratory	95,256	39,303	0	0	44,714	0	44,714
Bechtel Marine Propulsion Corporation	465	826	0	25,000	0	0	25,000
Bettis Atomic Power Laboratory	412,500	471,700	0	0	0	485,765	485,765
Brookhaven National Laboratory	16,096	12,345	0	0	14,087	0	14,087
Chicago Operations Office	1,500	100	0	0	0	0	0
Consolidated Business Center	950	1,230	0	0	55,080	0	55,080
General Atomics	17,489	23,030	0	23,500	0	0	23,500
Headquarters	1,124,130	1,283,544	300,439	1,172,237	159,210	117,060	1,748,946
Idaho National Laboratory	228,758	217,350	0	3,293	101,722	149,265	254,280
Idaho Operations Office	1,550	0	0	0	0	0	0
Kansas City Plant	533,875	576,803	0	602,867	21,417	0	624,284
Kansas City Site Office	6,819	7,146	7,197	0	0	0	7,197
Knolls Atomic Power Laboratory	449,500	508,300	0	0	0	604,266	604,266
Lawrence Berkeley National Laboratory	6,391	14,377	0	0	9,811	0	9,811
Lawrence Livermore National Laboratory	1,071,673	1,063,678	0	998,616	109,257	0	1,107,873
Livermore Site Office	16,894	16,942	17,093	0	0	0	17,093
Los Alamos National Laboratory	1,693,616	1,582,264	0	1,425,659	218,487	0	1,644,146
Los Alamos Site Office	15,132	15,255	16,224	0	0	0	16,224
National Energy Technology Laboratory	18,810	5,861	0	17,241	0	0	17,241
Naval Reactors Laboratory Field Office	18,515	18,470	0	0	0	19,140	19,140
Naval Research Laboratory	64	5,900	0	5,900	0	0	5,900
Nevada National Security Site	361,760	288,352	0	245,183	64,668	0	309,851
Nevada Site Office	92,005	85,574	16,719	74,012	0	0	90,731
New Brunswick Laboratory	579	725	0	0	688	0	688
NNSA ABQ Complex (all other sites)	545,946	685,995	0	435,749	173,765	0	609,514
NNSA Production Office	0	1,726,835	0	2,013,096	8,634	0	2,021,730
NNSA Production Site Office	0	26,268	23,981	1,000	0	0	24,981
Oak Ridge Institute for Science and Engineering	15,260	13,656	0	0	58,340	0	58,340
Oak Ridge National Laboratory	100,627	93,003	0	2,083	215,661	0	217,744
Oak Ridge Operations Office	106,785	97,885	0	0	0	0	0
Office of Science and Technical Information	378	431	0	213	19	0	232
Pacific Northwest National Lab	50	827	0	0	0	0	0
Pacific Northwest National Laboratory	312,115	240,963	0	21,880	89,306	0	111,186
Pantex Plant	599,116	0	0	0	0	0	0
Pantex Site Office	11,643	0	0	0	0	0	0
Princeton	0	200	0	0	0	0	0
Richland Operations Office	1,578	1,550	0	0	1,550	0	1,550
Sandia National Laboratories	1,627,394	1,641,974	0	1,474,691	155,339	0	1,630,030
Sandia Site Office	20,758	21,661	16,016	0	0	0	16,016
Savannah River Operations Office	439,951	336,215	0	0	349,000	0	349,000
Savannah River Site	320,576	303,169	0	244,176	107,562	0	351,738
Savannah River Site Office	5,584	6,534	4,985	52	0	0	5,037
Stanford Linear Accelerator Center	920	1,800	0	0	0	0	0
University of Rochester/LLE	63,185	66,500	0	60,500	0	0	60,500
Westinghouse TRU Solutions (WIPP)	56	61	0	0	61	0	61
Y-12 National Security Complex	1,187,420	0	0	0	0	0	0
Y-12 Site Office	15,290	0	0	0	0	0	0
Adjustments of Prior Year Balances	-354,779	-105,568	0	0	-18,076	0	-18,076
Grand Total	11,204,180	11,399,034	402,654	8,846,948	1,940,302	1,375,496	12,565,400

Federal Salaries and Expenses

Federal Salaries and Expenses

Federal Salaries and Expenses
Proposed Appropriation Language

For necessary expenses for Federal Salaries and Expenses [(previously Office of the Administrator)] in the National Nuclear Security Administration, [$370,000,000] *$402,654,000,* to remain available until September 30, [2016] *2017*, including official reception and representation expenses not to exceed $12,000.

Explanation of Changes

The FY 2016 Budget Request provides funding for 1,690 full-time equivalents (FTEs) and support expenses needed to meet mission requirements. The FY 2015 Omnibus reflects a reduction of $40,842,000 from the FY 2015 President's Request and a $413,000 one-time rescission of prior year balances. In FY 2015, $31,172,000 of unobligated carryover will be used to offset this reduction. The FY 2016 request reflects an increase of $1,482,000 from the actual FY 2015 planned execution level of $401,172,000. The increase reflects pay escalation including a 1.3 percent cost of living adjustment and benefit escalation, increase of 45 FTEs, additional support to stand up the Cost Estimating and Program Evaluation (CEPE) office in accordance with Section 3112 of the FY 2014 National Defense Authorization Act (NDAA), additional corporate project management support, funding to improve financial systems integration within the nuclear security enterprise in accordance with Section 3128 of the FY 2014 NDAA, and an increase in the Working Capital Fund due to the one-time use of uncosted balances in FY 2015. This increase is partially offset by a reduction of $19,900,000 for the FY 2015 one-time cost to relocate NNSA employees in Albuquerque, New Mexico to a different leased facility.

Public Law Authorizations

- P.L. 106-65, National Nuclear Security Administration Act, as amended
- P.L. 113-291, National Defense Authorization Act for Fiscal Year 2015

Federal Salaries and Expenses*

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Federal Salaries and Expenses	377,000	370,500	370,000	402,654
Rescission of Prior Year Balances	0	0	-413	0
Total, Net of Rescission	**377,000**	**370,500**	**369,587**	**402,654**

* The FY 2015 Consolidated and Further Continuing Appropriations Act, 2015, includes a one-time rescission of prior year balances of $413,000 for Federal Salaries and Expenses.

Overview

NNSA's **Federal Salaries and Expenses** provides for a well-managed and accountable organization by supporting a highly-educated and skilled federal workforce to provide effective federal program oversight and financial management in close partnership with the national laboratories and our production facilities. The NNSA workforce consists of a diverse cadre of project managers, scientists, engineers, and foreign affairs specialists who execute the NNSA's critical nuclear and national security mission. This appropriation also provides for mission support functions that provide financial management, human capital management, corporate project management, legal services, procurement and contract management, safety and health, and cost estimating and program evaluation (CEPE).

The account also funds NNSA contributions to the Department's Working Capital Fund (WCF).

In addition to NNSA organizations located in the Washington, DC metro area; Germantown, Maryland; and Albuquerque, New Mexico; the organization includes seven federal site offices that oversee NNSA laboratory and production facility operations. The sites include: Lawrence Livermore, Los Alamos, and Sandia National Laboratories; the NNSA Production Office including the Pantex Plant and the Y-12 National Security Complex; Kansas City Plant; the Savannah River Site; and the Nevada National Security Site.

Highlights and Major Changes in the FY 2016 Budget Request

As responsible stewards of taxpayer money, NNSA has taken steps to reduce spending on federal program direction. Some actions taken include: reducing federal FTEs by 10.4 percent relative to the FY 2012 level of 1,886 FTEs and judiciously making prioritizing hires/backfills. NNSA also continues to identify efficiencies, particularly in travel and support services, to provide a lean and efficient organization and to support the President's Executive Order "*Promoting Efficient Spending*". These administrative savings are reflected in the FY 2016 to FY 2020 funding levels.

In FY 2016, NNSA will continue its on-going efforts to plan strategically to meet current and future workforce needs by analyzing how evolving missions are affecting job requirements. In order to meet mission requirements, reshaping of the workforce over the next several years will be essential. Reshaping involves both obtaining the right size and skill sets. In FY 2014, NNSA used the authority granted by the Office of Personnel Management to offer early retirement incentives to help right-size its workforce and as a cost savings measure. In FY 2016, NNSA plans to fill a number of mission critical positions, including key leadership positions in Headquarters and Site Office organizations, up to 1,690 FTEs, in accordance with the ceiling reflected in Section 3116 of the FY 2015 NDAA.

Within the proposed staffing ceiling, NNSA plans to stand up the Cost Estimating and Program Evaluation (CEPE) office, consistent with direction given in the FY 2014 NDAA, and improve NNSA's project management function with strategic hires in the Office of Acquisition and Project Management. For the CEPE function, NNSA will continue to build capabilities in accordance with the implementation plan submitted to the Congressional Defense Committees.

Major Outyear Priorities and Assumptions

Outyear funding levels for the NNSA Federal Salaries and Expenses appropriation total $1,694,385,000 for FY 2017 through FY 2020. The five-year funding plan assumes escalation including: a 1.3 percent cost of living adjustment, benefit escalation, and a two percent non-pay escalation; a Federal staffing level of 1,690 FTEs in accordance with Section 3116 of

the FY 2015 NDAA; increased support for the CEPE office in accordance with Section 3112 of the FY 2014 NDAA; and funding to improve financial systems integration within the Department in accordance with Section 3128 of the FY 2014 NDAA. Any adjustments to NNSA Federal Salaries and Expenses staffing will be made in future requests as NNSA mission needs change.

Department of Energy (DOE) Working Capital Fund (WCF) Support

The projected contribution to the DOE WCF from the NNSA Federal Salaries and Expenses appropriation for FY 2016 is estimated to be $41,371,000. This reflects an increase of $4,505,000 due to the one-time use of $7,000,000 in uncosted balances in the Working Capital Fund in FY 2015; partially offset by a reduction of $2,495,000 to the Federal Salaries and Expenses share of the Working Capital Fund. FY 2015 actual requirements total $43,866,000. The Department is working to achieve economies of scale through an enhanced WCF

NNSA Graduate Fellowship Program (NGFP) Support

The NNSA manages a technical fellowship program to cultivate the next generation of leaders in managing the nuclear stockpile, nonproliferation, nuclear security, and international security. This program will help foster the pipeline of highly qualified professionals who will sustain expertise in these areas through future employment within the nuclear security enterprise

In FY 2016, the NNSA Federal Salaries and Expenses appropriation will provide up to approximately $1,500,000 for NGFP activities in the areas of international operations, nuclear safety and health, and NNSA program support.

Federal Salaries and Expenses
Funding by Congressional Control

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
NNSA Federal Salaries and Expenses	**377,000**	**370,500**	**370,000**	**402,654**	**+32,654**
Rescission of Prior Year Balances	**0**	**0**	**-413**	**0**	**+413**
Total Federal Salaries and Expenses, Net of Rescissions	**377,000**	**370,500**	**369,587**	**402,654**	**+33,067**

Outyears for Federal Salaries and Expenses

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
NNSA Federal Salaries and Expenses	**410,393**	**418,406**	**428,260**	**437,326**
Rescission of Prior Year Balances	**0**	**0**	**0**	**0**
Total Federal Salaries and Expenses, Net of Rescissions	**410,393**	**418,406**	**428,260**	**437,326**

Federal Salaries and Expenses

Overview

Salaries and Benefits: Provides for the federal staff that oversees the operations of the national security missions related to the safety and reliability of the nuclear weapons stockpile, emergency response, nuclear nonproliferation efforts, safeguards and security oversight, strategic coordination of counterterrorism and counter-proliferation initiatives, providing safe, secure, and compliant facilities and infrastructure, and mission support to include: cost estimating and program evaluation, procurement, financial management, human capital management, legal services and safety and health.

Travel: Supports federal domestic and foreign travel necessary to conduct NNSA business. Domestic travel provides management oversight, public outreach, and national security assistance and interface with the Site Offices, Headquarters, the laboratories and plants, and local governments. International travel is a key element of the nonproliferation work with international agencies and other international partners.

Support Services: Includes Management and Professional Services to assist, advise, or train staff to achieve efficient and effective management and operation of organizations, activities, and systems, including administrative support; and funding for Environmental Safety and Health activities. It also includes funding for the NGFP. Beginning in FY 2015, Corporate Project Management (CPM) is included in NNSA Federal Salaries and Expenses, Support Services. Funding for this activity was transferred from the Weapons Activities Appropriation to the NNSA Federal Salaries and Expenses Appropriation consistent with the explanatory statement accompanying the P.L. 113-76, Consolidated Appropriation Act for 2014, which directs the NNSA to include funding requests for CPM under NNSA Federal Salaries and Expenses.

Other Related Expenses: Provides funding for Space and Occupancy costs for Headquarters and Field Offices, including NNSA Federal Salaries and Expenses contribution to the DOE WCF and overall operations and maintenance of both leased and federally owned space; necessary training and skills maintenance of the NNSA Federal staff; and funding for miscellaneous procurements.

Federal Salaries and Expenses

Program Direction

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 Request
NNSA Federal Salaries and Expenses					
Headquarters					
Salaries and Benefits	189,958	183,055	164,314	203,560	+39,246
Travel	11,091	8,495	10,774	10,798	24
Support Services	12,026	14,060	22,368	28,115	+5,747
Other Related Expenses	64,337	59,760	67,529	57,966	-9,563
Total, Headquarters	277,412	265,370	264,985	300,439	+35,454
Total, Full Time Equivalents	1,187	1,104	1,132	1,174	42
Livermore Field Office					
Salaries and Benefits	14,645	14,617	14,403	14,734	+331
Travel	245	187	260	235	-25
Support Services	597	662	587	587	0
Other Related Expenses	1,526	1,428	1,517	1,537	20
Total, Livermore Field Office	17,013	16,894	16,767	17,093	+326
Total, Full Time Equivalents	82	82	79	79	0
Los Alamos Field Office					
Salaries and Benefits	14,373	14,236	14,332	15,300	+968
Travel	293	215	200	200	0
Support Services	204	204	210	210	0
Other Related Expenses	522	477	513	514	1
Total, Los Alamos Field Office	15,392	15,132	15,255	16,224	+969
Total, Full Time Equivalents	86	86	85	88	3

Program Direction, Continued

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 Request
Sandia Field Office					
Salaries and Benefits	13,176	12,953	13,491	13,714	+223
Travel	211	223	260	260	0
Support Services	220	78	75	75	0
Other Related Expenses	1,674	7,504	7,835	1,967	-5868
Total, Sandia Field Office	15,281	20,758	21,661	16,016	-5,645
Total, Full Time Equivalents	82	81	83	82	-1
Nevada Field Office					
Salaries and Benefits	14,485	14,460	14,380	14,619	+239
Travel	251	190	243	243	0
Support Services	263	263	350	350	0
Other Related Expenses	1,707	2,585	1,507	1,507	0
Total, Nevada Field Office	16,706	17,498	16,480	16,719	+239
Total, Full Time Equivalents	84	83	81	80	-1
NNSA Production Office (NPO)					
Salaries and Benefits	20,096	19,885	19,646	20,546	+900
Travel	613	512	597	710	113
Support Services	343	343	384	271	-113
Other Related Expenses	2,507	2,546	2,454	2,454	0
Total, NNSA Production Office	23,559	23,286	23,081	23,981	+900
Full Time Equivalents	126	125	121	123	2

Program Direction, Continued

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 Request [a]
Kansas City Field Office					
Salaries and Benefits	5,445	5,448	5,657	5,888	+231
Travel	201	153	175	191	16
Support Services	313	313	412	296	-116
Other Related Expenses	855	905	722	822	100
Total, Kansas City Field Office	6,814	6,819	6,966	7,197	+231
Total, Full Time Equivalents	35	35	36	36	0
Savannah River Field Office					
Salaries and Benefits	4,456	4,433	4,454	4,639	+185
Travel	151	99	140	140	0
Support Services	84	77	97	87	-10
Other Related Expenses	132	134	114	119	5
Total, Savannah River Field Office	4,823	4,743	4,805	4,985	+180
Total, Full Time Equivalents	28	28	28	28	0
NNSA Federal Salaries and Expenses					
Salaries and Benefits	276,634	269,087	250,677	293,000	+42,323
Travel	13,056	10,074	12,649	12,777	+128
Support Services	14,050	16,000	24,483	29,991	+5,508
Other Related Expenses	73,260	75,339	82,191	66,886	-15,305
Total, NNSA Federal Salaries and Expenses	377,000	370,500	370,000	402,654	+32,654
Total, FTEs Requested	1,710	1,624	1,645	1,690	45

[a] Funding changes from FY 2015 to FY 2016 are in terms of the FY 2015 Enacted exclusive of rescissions.

Federal Salaries and Expenses

Support Services and Other Related Expenses

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 Request
Support Services					
Management and Professional Services	12,939	14,889	14,445	17,917	3,472
Studies, Analyses, and Evaluations	936	936	0	0	0
Environmental Safety and Health Support	175	175	175	175	0
Corporate Project Management Support	0	0	9,863	11,899	2,036
Total, Support Services	**14,050**	**16,000**	**24,483**	**29,991**	**5,508**
Other Related Expenses					
Training	4,004	3,108	4,124	4,124	0
Space and Occupancy Costs	15,251	17,158	34,671	14,861	-19,810

Support Services and Other Related Expenses, Continued

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 Request
Headquarters Working Capital Fund (WCF)					
Supplies	502	502	429	429	0
Mail Services	676	676	676	646	-30
Copying Service	730	730	713	710	-3
Printing and Graphics	367	367	362	361	-1
Building Occupancy	23,950	26,133	11,949	18,894	6,945
Telecommunications	5,160	5,160	5,237	5,235	-2
Procurement (DCAA)	210	210	184	141	-43
Corporate Training Services	218	218	273	409	+136
Project Management (PMCDP)	368	368	364	346	-18
iMANAGE	3,463	3,463	3,750	2,558	-1,192
Financial Statement Audits	77	77	0	0	0
Internal Control (A-123)	36	36	0	0	0
Indirect	0	0	0	0	0
Pensions	65	65	0	0	0
Overseas Representation	10,246	10,246	10,246	11,342	1,096
Interagency Transfers to GSA	2,199	2,199	2,250	0	-2,250
Health Services	392	392	433	300	-133
TOTAL, Headquarters Working Capital Fund (WCF)	48,659	50,842	36,866	41,371	4,505
Other Expenses					
Other Services	5,334	4,219	6,518	6,518	0
Reception and representation	12	12	12	12	0
Subtotal, Other Expenses	5,346	4,231	6,530	6,530	0
Total, Other Related Expenses	**73,260**	**75,339**	**82,191**	**66,886**	**-15,305**

Outyears

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
NNSA Federal Salaries and Expenses				
Headquarters				
Salaries and Benefits	207,632	211,783	216,019	220,340
Travel	11,014	11,234	11,459	11,688
Support Services	28,362	28,735	30,794	31,912
Other Related Expenses	59,126	60,310	61,517	62,746
Total, Headquarters	306,134	312,062	319,789	326,686
Total, Full Time Equivalents	1,174	1,174	1,174	1,174
Livermore Field Office				
Salaries and Benefits	15,029	15,330	15,637	15,950
Travel	240	245	250	255
Support Services	599	611	623	635
Other Related Expenses	1,568	1,599	1,631	1,664
Total, Livermore Field Office	17,436	17,785	18,141	18,504
Total, Full Time Equivalents	79	79	79	79
Los Alamos Field Office				
Salaries and Benefits	15,606	15,918	16,236	16,561
Travel	204	208	212	216
Support Services	214	218	222	226
Other Related Expenses	524	534	545	556
Total, Los Alamos Field Office	16,548	16,878	17,215	17,559
Total, Full Time Equivalents	88	88	88	88

Outyears, Continued

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Sandia Field Office				
Salaries and Benefits	13,988	14,268	14,553	14,844
Travel	265	270	275	281
Support Services	77	79	81	83
Other Related Expenses	2,006	2,046	2,087	2,129
Total, Sandia Field Office	16,336	16,663	16,996	17,337
Total, Full Time Equivalents	82	82	82	82
Nevada Field Office				
Salaries and Benefits	14,911	15,209	15,513	15,823
Travel	248	253	258	263
Support Services	357	364	371	378
Other Related Expenses	1,537	1,568	1,599	1,631
Total, Nevada Field Office	17,053	17,394	17,741	18,095
Total, Full Time Equivalents	80	80	80	80
NNSA Production Office (NPO)				
Salaries and Benefits	20,957	21,376	21,804	22,240
Travel	724	738	753	768
Support Services	276	282	288	294
Other Related Expenses	2,503	2,553	2,604	2,656
Total, NNSA Production Office	24,460	24,949	25,449	25,958
Full Time Equivalents	123	123	123	123

Federal Salaries and Expenses

Outyears, Continued

(Dollars in Thousand)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Kansas City Field Office				
Salaries and Benefits	6,006	6,126	6,249	6,374
Travel	195	199	203	207
Support Services	302	308	314	320
Other Related Expenses	838	855	872	889
Total, Kansas City Field Office	7,341	7,488	7,638	7,790
Total, Full Time Equivalents	36	36	36	36
Savannah River Field Office				
Salaries and Benefits	4,732	4,827	4,924	5,022
Travel	143	146	149	152
Support Services	89	91	93	95
Other Related Expenses	121	123	125	128
Total, Savannah River Field Office	5,085	5,187	5,291	5,397
Total, Full Time Equivalents	28	28	28	28
NNSA Federal Salaries and Expenses				
Salaries and Benefits	298,861	304,837	310,935	317,154
Travel	13,033	13,293	13,559	13,830
Support Services	30,276	30,688	32,786	33,943
Other Related Expenses	68,223	69,588	70,980	72,399
Total, NNSA Federal Salaries and Expenses	410,393	418,406	428,260	437,326
Total, FTEs	1,690	1,690	1,690	1,690

Federal Salaries and Expenses

Support Services and Other Related Expenses

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Support Services				
Management and Professional Services	17,960	18,127	19,973	20,874
Studies, Analyses, and Evaluations	0	0	0	0
Environmental Safety and Health Support	179	182	186	189
Project Management Support	12,137	12,380	12,627	12,880
Total, Support Services	**30,276**	**30,688**	**32,786**	**33,943**
Other Related Expenses				
Training	4,206	4,291	4,376	4,464
Space and Occupancy Costs	15,158	15,461	15,771	16,086

Support Services and Other Related Expenses, Continued

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Headquarters Working Capital Fund (WCF)				
Supplies	438	446	455	464
Mail Services	659	672	686	699
Copying Service	724	739	753	769
Printing and Graphics	368	376	383	391
Building Occupancy	19,272	19,657	20,050	20,451
Telecommunications	5,340	5,446	5,555	5,667
Procurement (DCAA)	144	147	150	153
Corporate Training Services	417	426	434	443
Project Management (PMCDP)	353	360	367	375
iMANAGE	2,609	2,661	2,715	2,769
Financial Statement Audits	0	0	0	0
Internal Control (A-123)	0	0	0	0
Indirect	0	0	0	0
Pensions	0	0	0	0
Overseas Representation	11,569	11,800	12,036	12,277
Interagency Transfers to GSA	0	0	0	0
Health Services	306	312	318	325
TOTAL, Headquarters Working Capital Fund	42,198	43,042	43,903	44,781
Other Expenses				
Other Services	6,647	6,781	6,917	7,054
Reception and representation	12	12	13	13
Subtotal, Other Expenses	6,660	6,794	6,930	7,067
Total, Other Related Expenses	**68,223**	**69,588**	**70,980**	**72,399**

Federal Salaries and Expenses
Program Direction

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015 [a]
Salaries and Benefits $250,677,000	**Salaries and Benefits $293,000,000**	**Salaries and Benefits +$42,323,000**
• In accordance with the FY 2015 National Defense Authorization Act, Section 3116, provides support for up to 1,690 employees by the end of the fiscal year. Includes payroll escalation including benefits, performance pay increases, and +1% for the calendar year 2015 pay raise. Pay and benefit escalation will be offset with attrition backfill savings. • $31,172,000 of unobligated balances will be used in FY 2015 to offset the reduction in the Omnibus. The total executed funding level for salaries and benefits is $281,849,000.	• Provides support for an NNSA Federal staff of 1,690 full-time equivalents (FTEs). Includes payroll escalation including benefit escalation, performance pay increases, and +1.3% for the calendar year 2016 pay raise (cost of living adjustment). The increases will partially be offset with attrition backfill savings. **FY 2017-FY 2020** • Provides support for a steady staffing level of 1,690. • NNSA will continue to reshape the workforce across the FYNSP to ensure future mission needs are met.	• The increase reflects the one-time use of unobligated balances in FY 2015 (+$31,172,000), FTE increase of 45 (+$7,700,000), and the projected 1.3% cost of living adjustment and 5% benefit escalation (+$3,451,000). Other pay escalation will be offset with attrition backfill savings. In the FYNSP period, NNSA will continue to reshape the workforce to ensure accomplishment of the NNSA mission while at an unchanged Federal staffing level.
Travel $12,649,000	**Travel $12,777,000**	**Travel +$128,000**
• Supports domestic and foreign travel necessary to conduct NNSA business. • Reflects NNSA efficiencies achieved in support of the President's Executive Order "Promoting Efficient Spending."	• Supports domestic and foreign travel necessary to conduct NNSA business. • Reflects NNSA efficiencies achieved in support of the President's Executive Order "Promoting Efficient Spending." **FY 2017-FY 2020** Levels reflect increase for inflation.	• The increase reflects escalation offset by federal travel efficiencies, including: utilization of video telecommunications capabilities; limiting the number of people authorized per trip; and reductions in the length of trips to the maximum extent practical.

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015 [a]
Support Services $24,483,000 • Includes Management and Professional Services; Studies, Analysis, and Evaluations; and Engineering and Technical Services; and Corporate Project Management to support the NNSA Federal staff • Reflects efficiencies achieved in support of the President's Executive Order "Promoting Efficient Spending." • Includes the transfer of $11,809,000 for *Corporate Project Management* from Weapons Activities, Site Stewardship to NNSA Federal Salaries and Expenses consistent with congressional direction contained in the P.L. 113-76, Consolidated Appropriation Act for 2014.	**Support Services $29,991,000** • Includes Management and Professional Services; Environment Safety and Health support; and Corporate Project Management to support the NNSA Federal staff • Reflects efficiencies achieved in support of the President's Executive Order "Promoting Efficient Spending." **FY 2017-FY 2020** • Levels reflect increase for inflation.	**Support Services +$5,508,000** • The increase reflect additional support to: stand-up the Office of Cost Estimating and Program Evaluation (CEPE) in accordance with Section 3112 of the FY 2014 National Defense Authorization Act (+$2,000,000), additional Corporate Project Management support (+$2,036,000), support for improved financial systems integration within the Department in accordance with Section 3128 of the FY 2014 National Defense Authorization Act (+$972,000), support for NNSA's Office of General Counsel's FOIA backlog reduction effort (+$500,000).
Other Related Expenses $82,191,000 • Provides funding for Space and Occupancy costs for Headquarters and the field including the NNSA DOE Federal Salaries and Expenses contribution to the DOE Working Capital Fund and overall operations and maintenance of both rented and federally owned space; necessary training and skills maintenance of the NNSA Federal staff; funding for the E-Gov initiative; and miscellaneous procurements. • Includes $19,900,000 to fund the upfront relocation and lease costs for a different facility for certain NNSA employees in Albuquerque, New Mexico. The facility is needed due to inadequate building systems in the current facilities, most beyond useful life with extensive backlog of needed repairs and maintenance.	**Other Related Expenses $66,886,000** • Provides funding for Space and Occupancy costs at Headquarters and field sites; includes the contribution to the DOE Working Capital Fund to provide overall operations and maintenance of both rented and federally owned space; necessary training and skills maintenance of the NNSA Federal staff; and miscellaneous procurements. **FY 2017-FY 2020** • Levels reflect increase for inflation. Working Capital Fund estimates for the outyears are not provided by the Department. Therefore, NNSA's Request assumes that contributions will continue at the FY 2016 level with escalation.	**Other Related Expenses -$15,305,000** • The decrease reflects the one-time upfront relocation and lease costs to a different facility for NNSA employees in Albuquerque, NM in the FY 2015 Request (-$19,900,000); reduction to the Federal Salaries and Expenses share of the Working Capital Fund (-$2,495,000) offset by the one-time use of uncosted balances in the Working Capital Fund in FY 2015 (+$7,000,000); escalation (+90,000).

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

Federal Salaries and Expenses
Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Federal Administrative Costs - Maintain NNSA Federal Salaries and Expenses Federal administrative costs as a percentage of total Weapons Activities and Defense Nuclear Nonproliferation program costs at less than 6%.							
Target	5.9 %	5.9 %	5.9 %	5.9 %	5.9 %	5.9 %	5.9%
Result	4.1						
Endpoint Target	In keeping with OMB and DOE expectations that administrative costs be minimized, maintain the NNSA Federal Salaries and Expenses Federal administrative costs as a percentage of total Weapons Activities and Defense Nuclear Nonproliferation program costs at less than 6%.						

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Office of the Administrator	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Kansas City Site Office			
Office of the Administrator			
Office of the Administrator	6,819	0	0
Total, Kansas City Site Office	**6,819**	**0**	**0**
Livermore Site Office			
Office of the Administrator			
Office of the Administrator	16,894	0	0
Total, Livermore Site Office	**16,894**	**0**	**0**
Los Alamos Site Office			
Office of the Administrator			
Office of the Administrator	15,132	0	0
Total, Los Alamos Site Office	**15,132**	**0**	**0**
Nevada Field Office			
Office of the Administrator			
Office of the Administrator	17,498	0	0
Total, Nevada Field Office	**17,498**	**0**	**0**
NNSA Production Office (NPO)			
Office of the Administrator			
Office of the Administrator	23,286	0	0
Total, NNSA Production Office (NPO)	**23,286**	**0**	**0**
Sandia Site Office			
Office of the Administrator			
Office of the Administrator	20,758	0	0
Total, Sandia Site Office	**20,758**	**0**	**0**
Savannah River Site Office			
Office of the Administrator			
Office of the Administrator	4,743	0	0
Total, Savannah River Site Office	**4,743**	**0**	**0**
Washington Headquarters			
Office of the Administrator			
Office of the Administrator	265,370	0	0
Total, Washington Headquarters	**265,370**	**0**	**0**
Total, Office of the Administrator	**370,500**	**0**	**0**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Federal Salaries and Expenses	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Kansas City Site Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	6,966	7,197
Total, Kansas City Site Office	**0**	**6,966**	**7,197**
Livermore Site Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	16,767	17,093
Total, Livermore Site Office	**0**	**16,767**	**17,093**
Los Alamos Site Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	15,255	16,224
Total, Los Alamos Site Office	**0**	**15,255**	**16,224**
Nevada Field Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	16,480	16,719
Total, Nevada Field Office	**0**	**16,480**	**16,719**
NNSA Production Office (NPO)			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	23,081	23,981
Total, NNSA Production Office (NPO)	**0**	**23,081**	**23,981**
Sandia Site Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	21,661	16,016
Total, Sandia Site Office	**0**	**21,661**	**16,016**
Savannah River Site Office			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	4,805	4,985
Total, Savannah River Site Office	**0**	**4,805**	**4,985**
Washington Headquarters			
Federal Salaries and Expenses			
Federal Salaries and Expenses	0	264,985	300,439
Total, Washington Headquarters	**0**	**264,985**	**300,439**
Total, Federal Salaries and Expenses	**0**	**370,000**	**402,654**

Weapons Activities

Weapons Activities

FY 2015 Congressional Budget Request

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, [and the purchase of not to exceed 4 passenger vehicles, $8,231,770,000] $*8,846,948,000* to remain available until expended: Provided, That [$97,118,000] *$105,338,000* shall be available until September 30, [2016] *2017*, for program direction. [:Provided further, That of the unobligated balances from prior year appropriations available under this heading, $45,113,000 is hereby rescinded: Provided further, That no amounts may be rescinded from amounts that were designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or the Balanced Budget and Emergency Deficit Control Act of 1985.]

Explanation of Change

The FY 2016 Request provides a 7.5% increase from the FY 2015 Enacted level. Increases are requested in support of execution of the Nuclear Weapons Council (NWC) approved "3+2" strategy, which aims to implement the modernization called for in the Nuclear Posture Review (NPR) that will enable a to reduction in the number and types of weapons in the stockpile while maintaining a safe, secure and effective deterrent. The request also reflects significant increases in our investment in critical plutonium capabilities and a domestic uranium enrichment source for tritium-production capabilities. Finally, nuclear security depends on sustaining America's research and development (R&D) leadership, and therefore robust funding is provided for such efforts.

Public Law Authorizations

- P.L. 106-65, National Nuclear Security Administration Act, as amended
- P.L. 113-176, National Defense Authorization Act for Fiscal Year 2015

Weapons Activities*

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Weapons Activities	7,845,000	7,854,197	8,231,770	8,846,948
Rescission of Prior Year Balances	-64,000	-64,000	-51,411	0
Total Weapons Activities, Net of Rescissions	**7,781,000**	**7,790,197**	**8,180,359**	**8,846,948**

* The FY 2014 Current includes a one-time rescission of prior year balances of $64,000,000 and the Consolidated and Further Continuing Appropriations Act, 2015, includes a one-time rescission of prior year balances of $51,411,000 for Weapons Activities.

Overview

The Weapons Activities appropriation includes funding for activities that carry out the National Security Strategy of the United States, and are central to the Department of Energy's (DOE) implementation of its Strategic Plan objective to: use science to maintain a safe, secure, and effective nuclear weapons stockpile that deters any adversary and protects our allies. Specifically, the FY 2016 Budget Request for Weapons Activities provides for the Research, Development, Test, and Evaluation (RDT&E) capabilities and their application to assess, maintain, and where necessary extend the life of the nuclear weapons stockpile. To accomplish this stockpile stewardship and management, the appropriation provides for modernization and maintenance of high security, technical, and unique facilities and infrastructure. This appropriation is closely aligned with the Department of Defense (DoD) requirements to ensure the U.S. nuclear deterrent continues to be safe, secure, and effective. The statutory objective of the stockpile stewardship program is to ensure a high level of confidence in the safety, reliability, and performance of weapons in the nuclear stockpile.

The programs of the Weapons Activities appropriation are conducted primarily at eight sites by a workforce of approximately 30,000 people. These programs are managed by a Federal workforce, composed of civilian and military staffs that are ultimately accountable to Congress, the President, and the public. Details about these programs are found in the FY 2015 Stockpile Stewardship and Management Plan (SSMP) and, within thirty days of submission of this request, the FY 2016 SSMP.

Highlights and Major Changes in the FY 2016 Budget

Programs funded within the Weapons Activities appropriation support the nation's current and future defense posture through sustainment of the nuclear stockpile and its attendant nationwide infrastructure of RDT&E capabilities. Weapons Activities provides for the maintenance and refurbishment of nuclear weapons to sustain confidence in their safety, reliability, and performance; expansion of scientific, engineering, and manufacturing capabilities to enable assessment and certification of the enduring nuclear weapons stockpile and manufacture of nuclear weapon components. Weapons Activities also provides for continued maintenance and investment in the NNSA nuclear security enterprise to be more responsive and cost effective. Weapons Activities provides protection and prevention for NNSA personnel, facilities, nuclear weapons, special nuclear material, and information from a full spectrum of insider and outsider threats.

The National Nuclear Security Administration (NNSA) proposes to make changes to the Weapons Activities budget structure as follows: 1) establish a new GPRA unit entitled Infrastructure and Safety (I&S), which will include programs previously funded with Readiness in Technical Base and Facilities (RTBF) and Site Stewardship and 2) merge the Nuclear Counterterrorism Incident Response (NCTIR) and the Counterterrorism and Counterproliferation (CTCP) Programs to eliminate confusion about NNSA nuclear counterterrorism programs and activities, change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program, and move to the Defense Nuclear Nonproliferation (DNN) appropriation. These realignments will present with greater clarity the total funding and level of activity undertaken by NNSA in this increasingly important area. Similarly, they will focus the Weapons Activities appropriation on maintenance, modernization, and security of the U.S. nuclear stockpile and related activities. DSW also now contains a Nuclear Material Commodities set of activities that consolidates funding for key material and production capabilities for plutonium, uranium, tritium, and enriched uranium for tritium production.

FY 2016 funding for the Pantex and Y-12 Sites incorporate a change in the site's cost model for all NNSA programs, and a reduced fee rate under the Consolidated Nuclear Security (CNS) contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution. For all programs, there are CNS cost model funding increases and decrease which are offset within NNSA that do not change program scope.

The new Infrastructure and Safety (I&S) GPRA unit builds upon structure changes initiated by Congress in the FY 2014 Consolidated Appropriations Act, and includes funding for the underlying physical infrastructure and operational capability to meet the nuclear security mission. It includes the following subprograms: 1) Operations of Facilities which supports the base operations costs across the nuclear security enterprise; 2) Safety Operations which includes resources for cross-cutting programmatic functions such as Long Term Stewardship (formerly Environmental Projects and Operations), Nuclear Safety Research & Development, Nuclear Criticality Safety, and the Packaging (formerly Containers) program; 3) Maintenance which consists of activities performed to sustain property, roads, assets, systems, and non-programmatic equipment in a condition suitable for it to be used for its designated purpose or to maintain excess facilities to adequately mitigate risk until disposition; 4) Recapitalization which consists of planning, management, and execution of workplace improvements, betterments, minor constructions, repair and replacements, and disposition projects of NNSA assets to improve the condition and extend the design life of structures, equipment and systems; and 5) Construction which is aimed at revitalizing the facilities and capabilities of core, shared, and base infrastructure that support the national security missions.

The new Infrastructure and Safety GPRA unit contains a Recapitalization control which is to improve the condition and extending the design life structures, equipment and systems. The RTBF GPRA unit also contains a Recapitalization control which is to revitalize the nuclear security enterprise's weapons manufacturing and research and development infrastructure. The programmatic activities and mission capabilities will remain in the RTBF program.

The major elements of the program include the following:

Directed Stockpile Work

Encompasses all activities that directly support the nuclear weapons stockpile. These activities include: maintenance and surveillance; planned refurbishment; reliability assessment; weapon dismantlement and disposal; and research, development, and certification technology efforts to meet stockpile requirements. For FY 2016, DSW will transition life extension activities to Phase 6.4 production engineering in accordance with the integrated schedule to continue progress towards an FY 2020 B61-12 LEP first production unit, execute the W76-1 LEP to meet the current deliverables in agreement with the Department of the Navy and execute the W88 ALT 370 which will address lifetime requirements to include a conventional high explosive refresh, and continue Phase 6.2 for the W80-4 LEP with a first production unit in FY 2025. DSW also now contains a Nuclear Material Commodities set of activities that consolidates funding for key material and production capabilities for plutonium, uranium, tritium, and enriched uranium for tritium production.

The addition of a Uranium Sustainment line is consistent with recommendations of the Final Report of the Committee to Recommend Alternatives to the Uranium Processing Facility Plan in Meeting the Nation's Enriched Uranium Strategy. The Uranium Sustainment Program mission expands efforts to reduce safety risks, implements a new model of near just-in-time material inventories, and increases the reliability of uranium capabilities. Additional work is shown under RTBF MRR and Storage transferring scope for specific acceleration of Area 5 De-inventory to the Uranium Sustainment subprogram under the Nuclear Material Commodities program within Directed Stockpile Work which also includes Domestic Uranium Enrichment. Additionally, the RTBF construction, the Uranium Processing Facility (UPF), will no longer be a single big box facility, but rather will be a series of smaller, segregated facilities designed and constructed to individual safety and security criteria, commensurate to the protection of the unit operation contained within it. The strategy provides a more consistent annual funding profile for Enriched Uranium (EU) investments, balanced between the delivery of new build facilities and reduction of risk in ongoing operations.

Research, Development, Test, and Evaluation (RDT&E) Programs

Focuses on RDT&E efforts to develop and maintain critical capabilities, tools, and processes needed to support science based stockpile stewardship, refurbishment, and continued certification of the stockpile over the long-term in the absence of underground nuclear testing. For FY2016, focus will be on the release of validation data on required weapon systems internal and external intrinsic radiation environments, expand the predictive capability assessment suites to include additional hydrodynamic tests, and scaled experiments, and initiate electronics-based arming, fuzing, and firing technologies. The Readiness Campaign has been replaced by a new Advanced Manufacturing Development program that

provides funding for component manufacturing development and process technology development. In FY 2016 additive manufacting development, also known as 3D printing, will transition to the relevant programs in support of their specific mission requirements. Additive manufacturing supports stockpile production and experimental activities through the production of prototypes, mass mocks, production tooling, and war reserve components. This focused effort is intended to incrementally build confidence using science-based qualification techniques in a manufacturing technology that has the potential to increase responsiveness, and reduce waste and costs, while enabling component/part designs that cannot be manufactured by conventional means.

Readiness in Technical Base and Facilities

Provides a defined level of readiness and capabilities through infrastructure investments and strategy development for SNM processing and inventory management. RTBF also plans, prioritizes, and constructs state-of-the-art facilities, infrastructure, and scientific tools for the enterprise within approved baseline costs and schedules. The RTBF program accomplishes this mission by the modernization of NNSA infrastructure through recapitalization which is the continued investment in equipment to support warhead assessment and revitalizing the nuclear security enterprise's weapons manufacturing and research and development infrastructure, capability investments, strategic development, and line-item construction projects for the enhancement of capabilities. For FY2016, funding continues for the Uranium Processing Facility project at Y-12 (though under a new uranium strategy) and the Chemistry and Metallurgy Research Replacement project at LANL following redefinition of the plutonium strategy to ensure the continued availability of mission critical uranium and plutonium capabilities.

Infrastructure and Safety

Provides for the base operations funding required to operate NNSA facilities and support underlying infrastructure and capabilities at the level necessary to deliver mission results in a safe and secure manner. Includes resources for cross-cutting programmatic functions such as Long Term Stewardship (formerly Environmental Projects and Operations), Nuclear Safety Research & Development, Nuclear Criticality Safety, and the Packaging (formerly Containers) program. In FY 2016, begin the next step in a long-term effort to arrest the declining state of NNSA and that address critical safety and program risks, such as ensuring enriched uranium capabilities at Y-12 National Security Complex (Y-12); improving seismic and criticality safety systems for plutonium facilities at Los Alamos National Laboratory (LANL); and preparing the Kansas City Bannister Road Complex for transfer to a private entity.

Secure Transportation Asset

Provides for the safe, secure movement of nuclear weapons, special nuclear material, and weapon components to meet projected DOE, DoD, and other customer requirements. The Program Direction in this account provides for the secure transportation workforce, including the Federal agents. In FY 2016, the STA will continue its asset modernization and workforce capability initiatives including the Safeguards Transporter (SGT) Risk Reduction Initiatives to extend the life of the SGT, Analysis of Alternatives for the Mobile Guardian Transporter (MGT) development, testing and production, complete the phased deployment of the Advanced Radio Enterprise System (ARES) and restoration of federal agent strength levels.

Site Stewardship

Site Stewardship ensures the overall health and viability of the nuclear security enterprise, with a focus on: stabilization, consolidation, packaging and disposition of nuclear materials under the Nuclear Materials Integration program; and research and education enhancements at under-represented colleges and universities funded by the Minority Serving Institution Partnership Programs (MSIPP) to develop the needed skills and talent for NNSA's enduring technical workforce at the laboratories and production plants. In FY 2016, the NMI program will fund Inactive Actinide activities at the Oak Ridge National Laboratory (ORNL), Los Alamos National Laboratory (LANL), and Y-12; complete pre-receipt preparations and cask certification for the removal of plutonium-bearing mixed oxide fuel at SNL; and process and disposition of SNL sodium bonded debris material at INL. The MSI Partnership Program will continue to pursue and cultivate partnerships, collaborations and consortiums that align with the research and resources conducted at NNSA/DOE national laboratories.

Defense Nuclear Security

Provides protection for NNSA personnel, facilities, and nuclear weapons and materials from a full spectrum of threats, most notably terrorism. Provides for all safeguards and security requirements including protective forces and systems at all NNSA sites. In FY 2016, there are additional protective force Full Time Equivalents (FTEs) provided to support protective force training and management of shift staff/coverage of posts to reduce the need for overtime.

Information Technology and Cybersecurity

Provides for research and development of information technology and cybersecurity solutions such as identity, credential, and access management to help meet energy security, proliferation resistance, and climate goals. In FY 2016, efforts to support the recapitalization of the Enterprise Secure Network, modernize the Cybersecurity infrastructure, implement the Identity, Credential and Access Management (ICAM) project at NNSA Headquarters and site elements and continue to increase the efficiency and cost-effectiveness of NNSA IT services.

Crosscutting programs

In FY 2015, the Department was reorganized into three Under Secretariats—Science and Energy, Nuclear Security, and Management and Performance —that recognizes the complex interrelationship among DOE Program Offices. The FY 2016 Budget Request continues crosscutting programs which coordinate across the Department and seek to tap DOE's full capability to effectively and efficiently address the United States' energy, environmental, and national security challenges. These crosscutting initiatives (which are listed below) will be discussed further within the Programs in which the crosscuts are funded.

Cybersecurity Crosscut: The Department of Energy (DOE) is engaged in three categories of cyber-related activities: protecting the DOE enterprise from a range of cyber threats that can adversely impact mission capabilities; bolstering the U.S. Government's capabilities to address cyber threats; and, improving cybersecurity in the electric power subsector and the oil and natural gas subsector. The cybersecurity crosscut supports central coordination of the strategic and operational aspects of cybersecurity and facilitates cooperative efforts such as the Joint Cybersecurity Coordination Center (JC3) for incident response and the implementation of Department-wide Identity Control and Access Management (ICAM).

Exascale Computing: Exascale systems are needed to support areas of research that are critical to national security objectives as well as applied research advances in areas such as climate models, combustion systems, and nuclear reactor design that are not within the capacities of today's systems. Exascale systems' computational power are needed for increasing capable data-analytic and data-intense applications across the entire Federal complex. Exascale is a component of long-term collaboration between the Office of Science's Advanced Scientific Computing Research program and the National Nuclear Security Administration's Advanced Simulation and Computing (ASC) program.

FY 2016 Crosscuts

(Dollars in Thousands)

	Cybersecurity	Exascale	Total
Advanced Simulation and Computing – Exascale	0	64,000	64,000
Information Technology and Cybersecurity	132,786	0	132,786
Total, Crosscuts	**132,786**	**64,000**	**196,786**

Major Outyear Priorities and Assumptions

Outyear funding levels for the Weapons Activities appropriation total $38,314,223,000 for FY 2017 through FY 2020.

The priorities for the Weapons Activities appropriation are:

- Accomplish all required stockpile maintenance activities to sustain the existing stockpile
- Execute the NWC approved life extension programs (LEP) including the B61-12, with completion of a first production unit no later than FY second-quarter (Q2) 2020.
- Complete W76-1 production by FY 2019, while supporting U.S. Navy W76-1 fleet deployment requirements.
- Complete a W88 arming, fuzing, and firing (AF&F) first production unit in FY first-quarter (Q1) 2020, to include a conventional high explosive refresh, to avoid impacting U.S. Navy operational forces and support the W78 and W87 fuze activities.
- Continue the W80-4 LEP, previously titled Cruise Missile Warhead LEP, with an adjusted FY 2025 first production unit in support of the Air Force Long Range Stand Off (LRSO) program.

- Execute a plutonium strategy that achieves a 30 pit per year (ppy) capacity by 2026; demonstrates, for a pilot period, a 50-80 ppy capacity by FY 2027 -2029; and cessation of programmatic activities in the Chemistry and Metallurgy Research Facility at Los Alamos National Laboratory by FY 2019.
- Execute a new uranium strategy to ensure the long term viability of uranium manufacturing capabilities and processes through a combination of risk reduction, recapitalization of existing infrastructure, and new facilities.
- Execute RDT&E activities that both support the priorities listed above and sustain the associated workforce.
- Maintain a risk-based security program and collaboration with the DoD, in support of nuclear security enterprise goals.
- Transform the computing environment by delivering the NNSA Network Vision (2NV) and the Joint Cyber Security Coordination Center (JC3).
- Continues on schedule to meet the NNSA goal to dismantle by FY 2022 all weapons retired from the stockpile prior to FY 2009.
- Improve facility maintenance activities and reinvestment projects to arrest growth in deferred maintenance.

DOE Working Capital Fund (WCF) Support

DOE WCF Support from the NNSA Weapons Activities appropriation projected contribution to the DOE WCF for FY 2016 is $27,996,000. This funding covers certain shared enterprise activities including managing enterprise-wide systems and data, telecommunications and supporting the integrated acquisition environment.

Legacy Contractor Pensions

This funding provides the annual Weapons Activities share of the DOE's reimbursement of payments made to the University of California (UC) Retirement Plan (UCRP) for former UC employees and annuitants who worked at the Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory (LANL). The UCRP benefit for these individuals is a legacy cost and DOE's annual payment to the UC is required by the contracts. The amount of the annual payment is based on the actuarial valuation report and is covered by the terms described in the contracts. Funding for these contracts will be paid through the Legacy Contractor Pension line item.

NNSA Graduate Fellowship Program (NGFP) Support

The NNSA manages a technical fellowship program to cultivate the next generation of future leaders in nonproliferation, nuclear security, and international security to create a pipeline of highly qualified professionals who will sustain expertise in these areas through future employment within the nuclear security enterprise.

The majority of the efforts directly support program activities, and programs funded in the Weapons Activities appropriation plan up to approximately $2 million in FY 2016, in areas including nuclear weapons surety and quality, research and development, science and manufacturing, nuclear weapons stockpile, and air delivered system acquisitions.

Weapons Activities
Funding by Congressional Control
(Non-Comparable)[a]

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Directed Stockpile Work					
Life Extension Programs and Major Alterations					
B61 Life Extension Program	537,044	537,044	643,000	643,300	+300
W76 Life Extension Program	248,454	246,394	259,168	244,019	-15,149
W78/88-1 Life Extension Program	0	0	0	0	0
W78 Life Extension Program	38,000	38,000	0	0	0
W88 Alt 370	169,487	169,487	165,400	220,176	+54,776
Cruise Missile Warhead Life Extension Program	0	0	9,418	0	-9,418
W80-4 Life Extension Program	0	0	0	195,037	+195,037
Total, Life Extension Programs and Major Alterations	**992,985**	**990,925**	**1,076,986**	**1,302,532**	**+225,546**
Stockpile Systems					
B61 Stockpile Systems	83,536	83,245	109,615	52,247	-57,368
W76 Stockpile Systems	47,187	46,940	45,728	50,921	+5,193
W78 Stockpile Systems	54,381	54,047	62,703	64,092	+1,389
W80 Stockpile Systems	50,330	50,185	70,610	68,005	-2,605
B83 Stockpile Systems	54,948	54,697	63,136	42,177	-20,959
W87 Stockpile Systems	101,506	101,186	91,255	89,299	-1,956
W88 Stockpile Systems	62,600	62,332	88,060	115,685	+27,625
Total, Stockpile Systems	**454,488**	**452,632**	**531,107**	**482,426**	**-48,681**
Weapons Dismantlement and Disposition	**54,264**	**51,747**	**50,000**	**48,049**	**-1,951**
Stockpile Services					
Production Support	345,000	337,344	350,942	447,527	+96,585
Research and Development Support	24,928	24,844	25,500	34,159	+8,659
Research and Deveopment Certification and Safety	151,133	150,556	160,000	192,613	+32,613
Managemement, Technology, and Production	214,187	213,361	226,000	264,994	+38,994
Plutonium Sustainment	0	0	132,000	0	-132,000
Plutonium Infrastructure Sustainment	125,048	124,620	0	0	0
Tritium Readiness	80,000	83,500	140,053	0	-140,053
Total, Stockpile Services	**940,296**	**934,225**	**1,034,495**	**939,293**	**-95,202**
Nuclear Material Commodities					
Uranium Sustainment	0	0	0	32,916	+32,916
Plutonium Sustainment	0	0	0	174,698	+174,698
Tritium Sustainment	0	0	0	107,345	+107,345
Domestic Uranium Enrichment	0	0	0	100,000	+100,000
Total, Nuclear Material Commodities	**0**	**0**	**0**	**414,959**	**+414,959**

[a] The annual total includes an allocation to NNSA from the Department of Defense's five year budget plan. The amount included for Weapons Activities is $1,132,763 in FY 2017, $1,271,473 in FY 2018, $1,297,796 in FY 2019, and $1,326,348 in FY2020.

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Research, Development, Test and Evaluation (RDT&E)					
Science					
Advanced Certification	58,747	58,631	58,747	50,714	-8,033
Primary Assessment Technologies	92,000	91,682	109,000	98,500	-10,500
Dynamic Materials Properties	104,000	103,696	109,000	109,000	0
Advanced Radiography	29,509	29,438	47,000	47,000	0
Secondary Assessment Technologies	85,467	85,167	88,344	84,400	-3,944
Total, Science	**369,723**	**368,614**	**412,091**	**389,614**	**-22,477**
Engineering					
Enhanced Surety	51,771	51,711	52,003	50,821	-1,182
Weapon Systems Engineering Assessment Technology	23,727	23,709	20,832	17,371	-3,461
Nuclear Survivability	19,504	19,483	25,371	24,461	-910
Enhanced Surveillance	54,909	54,695	37,799	38,724	+925
Total, Engineering	**149,911**	**149,598**	**136,005**	**131,377**	**-4,628**
Inertial Confinement Fusion Ignition and High Yield					
Ignition	80,245	80,005	77,994	73,334	-4,660
Support of Other Stockpile Programs	15,001	14,935	23,598	22,843	-755
Diagnostics, Cryogenics and Experimental Support	59,897	59,483	61,297	58,587	-2,710
Pulsed Power Inertial Confinement Fusion	5,024	5,022	5,024	4,963	-61
Joint Program in High Energy Density Laboratory Plasmas	8,198	8,198	9,100	8,900	-200
Facility Operations and Target Production	345,592	344,751	335,882	333,823	-2,059
Total, Inertial Confinement Fusion Ignition and High Yield	**513,957**	**512,394**	**512,895**	**502,450**	**-10,445**
Advanced Simulation and Computing	**569,329**	**568,633**	**598,000**	**623,006**	**+25,006**
Readiness Campaign					
Non-Nuclear Readiness	55,407	55,205	0	0	0
Total, Readiness Campaign	**55,407**	**55,205**	**0**	**0**	**0**
Advanced Manufacturing Development					
Additive Manufacturing	0	0	12,600	0	-12,600
Component Manufacturing Development	0	0	75,000	112,256	37,256
Process Technology Development	0	0	19,600	17,800	-1,800
Total, Advanced Manufacturing Development	**0**	**0**	**107,200**	**130,056**	**+22,856**
Total, RDT&E	**1,658,327**	**1,654,444**	**1,766,191**	**1,776,503**	**+10,312**

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Readiness in Technical Base and Facilities [a]					
Operating					
Operations of Facilities					
Kansas City Plant	135,834	135,502	125,000	0	-125,000
Lawrence Livermore National Laboratory	77,287	76,367	71,000	0	-71,000
Los Alamos National Laboratory	213,707	213,707	198,000	0	-198,000
Nevada National Security Site	100,929	99,953	89,000	0	-89,000
Pantex Plant	81,420	79,334	75,000	0	-75,000
Sandia National Laboratory	115,000	119,500	106,000	0	-106,000
Savannah River Site	90,236	90,236	81,000	0	-81,000
Y-12 National Security Complex	170,042	165,887	151,000	0	-151,000
Total, Operations of Facilities	**984,455**	**980,486**	**896,000**	**0**	**-896,000**
Program Readiness	67,259	67,234	68,000	75,185	+7,185
Material Recycle and Recovery	125,000	120,154	126,000	173,859	+47,859
Containers	26,000	25,416	26,000	0	-26,000
Storage	35,000	34,878	40,800	40,920	+120
Maintenance and Repair of Facilities	227,591	232,591	227,000	0	-227,000
Recapitalization	180,000	180,000	224,600	104,327	-120,273
Total, Operating	**1,645,305**	**1,640,759**	**1,608,400**	**394,291**	**-1,214,109**
Construction					
15-D-613, Emergency Operations Center, Y-12	0	0	2,000	0	-2,000
15-D-302, TA-55 Reinvestment Project, Phase 3, LANL	0	0	16,062	18,195	+2,133
15-D-301, HE Science & Engineering Facility, PX	0	0	11,800	0	-11,800
12-D-301, TRU Waste Facilities, LANL	26,722	26,722	6,938	0	-6,938
11-D-801, TA-55 Reinvestment Project, Phase 2, LANL	30,679	30,679	10,000	3,903	-6,097
07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade Project, LANL	45,114	45,114	0	11,533	+11,533
07-D-220-04, Transuranic Liquid Waste Facility, LANL	10,605	10,605	7,500	40,949	+33,449
06-D-140, Project Engineering & Design, VL	0	2,500	0	0	0
06-D-141, Uranium Processing Facility, Y-12	309,000	304,000	335,000	430,000	+95,000
04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL	0	0	35,700	155,610	+119,910
Total, RTBF Construction	**422,120**	**419,620**	**425,000**	**660,190**	**+235,190**
Total, Readiness in Technical Base and Facilities [a]	**2,067,425**	**2,060,379**	**2,033,400**	**1,054,481**	**-978,919**

[a] A portion of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit, starting in FY 2016.

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Secure Transportation Asset (STA)					
Operations and Equipment	112,882	116,382	121,882	146,272	+24,390
Program Direction	97,118	93,618	97,118	105,338	+8,220
Total, Secure Transportation Asset	**210,000**	**210,000**	**219,000**	**251,610**	**+32,610**
Nuclear Counterterrorism Incident Response [a]	**228,243**	**228,521**	**177,940**	**0**	**-177,940**
Counterterrorism and Counterproliferation Programs [a]	**0**	**0**	**46,093**	**0**	**-46,093**
Infrastructure and Safety					
Operations					
Operations of Facilities					
Kansas City Plant	0	0	0	100,250	+100,250
Lawrence Livermore National Laboratory	0	0	0	70,671	+70,671
Los Alamos National Laboratory	0	0	0	196,460	+196,460
Nevada National Security Site	0	0	0	89,000	+89,000
Pantex Plant	0	0	0	58,021	+58,021
Sandia National Laboratory	0	0	0	115,300	+115,300
Savannah River Site	0	0	0	80,463	+80,463
Y-12 National Security Complex	0	0	0	120,625	+120,625
Total, Operations of Facilities	**0**	**0**	**0**	**830,790**	**+830,790**
Safety Operations	0	0	0	107,701	+107,701
Maintenance	0	0	0	227,000	+227,000
Recapitalization	0	0	0	257,724	+257,724
Total, Operations	**0**	**0**	**0**	**1,423,215**	**+1,423,215**
Construction					
16-D-621 Substation Replacement at TA-3, LANL	0	0	0	25,000	+25,000
15-D-613, Emergency Operatons Center, Y-12	0	0	0	17,919	+17,919
Total, Infrastructure and Safety Construction	**0**	**0**	**0**	**42,919**	**+42,919**
Total, Infrastructure and Safety	**0**	**0**	**0**	**1,466,134**	**+1,466,134**

[a] The Nuclear Counterterrorism Incident Response Program and the Counterterrorism and Counterproliferation Programs are proposed to be transferred from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation starting in FY 2016.

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Site Stewardship	**87,326**	**86,925**	**76,531**	**36,595**	**-39,936**
Defense Nuclear Security					
Operations and Maintenance	**664,981**	**658,663**	**636,123**	**619,891**	**-16,232**
Construction					
14-D-710 DAF Argus, NNSS	0	0	0	13,000	+13,000
08-D-701 Nuclear Materials S&S Upgrade Project, Phase 2, LANL	0	480	0	0	0
Total, Defense Nuclear Security Construction	**0**	**480**	**0**	**13,000**	**13,000**
Total, Defense Nuclear Security	**664,981**	**659,143**	**636,123**	**632,891**	**-3,232**
Information Technology and Cybersecurity	**145,068**	**144,442**	**179,646**	**157,588**	**-22,058**
Legacy Contractor Pensions	**279,597**	**335,490**	**307,058**	**283,887**	**-23,171**
Domestic Uranium Enrichment (DUE) Research, Development and Demonstration	**62,000**	**105,952**	**97,200**	**0**	**-97,200**
Total, Weapons Activities	**7,845,000**	**7,914,825**	**8,231,770**	**8,846,948**	**615,718**
Use of Prior Year Balances	**0**	**-60,628**	**0**	**0**	**0**
Rescission of Prior Year Balances	**-64,000**	**-64,000**	**-51,411**	**0**	**51,411**
Total Weapons Activities, Net of Rescissions	**7,781,000**	**7,790,197**	**8,180,359**	**8,846,948**	**+666,589**

Outyears for Weapons Activities

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Directed Stockpile Work				
Life Extension Programs and Major Alterations				
B61 Life Extension Program	623,402	734,905	733,546	760,820
W76 Life Extension Program	227,288	228,148	119,824	27,800
W78/88-1 Life Extension Program	0	0	0	112,808
W78 Life Extension Program	0	0	0	0
W88 Alt 370	232,898	224,546	219,679	218,322
W80-4 Life Extension Program	312,240	407,270	473,760	459,346
Total, Life Extension Programs and Major Alterations	**1,395,828**	**1,594,869**	**1,546,809**	**1,579,096**
Stockpile Systems				
B61 Stockpile Systems	52,580	53,714	50,760	51,869
W76 Stockpile Systems	45,119	43,928	61,291	77,773
W78 Stockpile Systems	60,916	63,957	62,246	79,939
W80 Stockpile Systems	64,520	72,848	65,632	66,877
B83 Stockpile Systems	42,174	37,691	36,083	22,581
W87 Stockpile Systems	83,044	82,832	77,553	79,925
W88 Stockpile Systems	123,651	159,963	172,860	165,298
Total, Stockpile Systems	**472,004**	**514,933**	**526,425**	**544,262**
Weapons Dismantlement and Disposition	**48,274**	**49,990**	**52,370**	**51,773**
Stockpile Services				
Production Support	462,642	475,200	515,273	494,669
Research and Development Support	43,453	46,284	52,737	53,776
Research and Deveopment Certification and Safety	207,178	247,401	259,812	262,018
Managemement, Technology, and Production	255,203	277,763	331,532	325,821
Plutonium Sustainment	0	0	0	0
Plutonium Infrastructure Sustainment	0	0	0	0
Tritium Readiness	0	0	0	0
Total, Stockpile Services	**968,476**	**1,046,648**	**1,159,354**	**1,136,284**
Nuclear Material Commodities				
Uranium Sustainment	30,700	29,191	27,800	29,892
Plutonium Sustainment	179,888	141,069	155,767	176,557
Tritium Sustainment	126,821	140,182	120,444	122,950
Domestic Uranium Enrichment	100,000	100,000	100,000	100,000
Total, Nuclear Material Commodities	**437,409**	**410,442**	**404,011**	**429,399**
Total, Directed Stockpile Work	**3,321,991**	**3,616,882**	**3,688,969**	**3,740,814**

	(Dollars in Thousands)			
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Research, Development, Test and Evaluation				
Science				
Advanced Certification	54,943	59,339	64,085	69,212
Primary Assessment Technologies	104,760	113,141	122,192	126,967
Dynamic Materials Properties	129,840	130,000	140,000	140,000
Advanced Radiography	55,762	91,442	77,912	78,480
Secondary Assessment Technologies	91,260	92,000	92,000	92,000
Total, Science	**436,565**	**485,922**	**496,189**	**506,659**
Engineering				
Enhanced Surety	37,196	44,412	45,757	44,072
Weapon Systems Engineering Assessment Technology	15,958	22,009	20,731	21,153
Nuclear Survivability	26,105	28,170	29,155	29,949
Enhanced Surveillance	41,228	44,127	45,186	46,125
Total, Engineering	**120,487**	**138,718**	**140,829**	**141,299**
Inertial Confinement Fusion Ignition and High Yield				
Ignition	75,432	77,112	79,032	80,952
Support of Other Stockpile Programs	23,363	23,864	24,414	24,964
Diagnostics, Cryogenics and Experimental Support	68,125	76,800	80,760	84,790
Pulsed Power Inertial Confinement Fusion	4,945	4,945	4,945	4,945
Joint Program in High Energy Density Laboratory Plasmas	9,492	9,865	10,000	10,000
Facility Operations and Target Production	344,053	353,465	358,422	363,686
Total, Inertial Confinement Fusion Ignition and High Yield	**525,410**	**546,051**	**557,573**	**569,337**
Advanced Simulation and Computing	**636,151**	**649,573**	**663,279**	**677,274**
Readiness Campaign				
Non-Nuclear Readiness	0	0	0	0
Total, Readiness Campaign	**0**	**0**	**0**	**0**
Advanced Manufacturing Development				
Additive Manufacturing	0	0	0	0
Component Manufacturing Development	86,659	57,136	62,766	64,009
Process Technology Development	19,613	22,100	28,201	28,692
Total, Advanced Manufacturing Development	**106,272**	**79,236**	**90,967**	**92,701**
Total, RDT&E	**1,824,885**	**1,899,500**	**1,948,837**	**1,987,270**

	(Dollars in Thousands)			
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Readiness in Technical Base and Facilities				
Operating				
Program Readiness	75,185	77,218	77,218	77,218
Material Recycle and Recovery	144,679	145,326	141,644	146,118
Storage	37,253	39,122	38,200	41,001
Recapitalization	111,322	101,689	119,059	110,732
Total, Operating	**368,439**	**363,355**	**376,121**	**375,069**
Construction				
19-D-xxx, Weapons Engineering Facility, SNL	0	0	10,023	20,902
18-D-xxx, Energetic Materials Characterization, LANL	0	7,000	11,500	18,120
18-D-xxx, HE Component Fab & Qual Facility, PX	0	21,300	11,346	9,000
17-D-xxx, Tritium Production Capability, SRS	6,800	25,505	49,500	13,000
17-D-xxx, Lithium Production Facility, Y-12	28,500	34,500	53,000	4,000
15-D-302, TA-55 Reinvestment Project, Phase 3, LANL	21,455	23,300	17,500	12,996
15-D-301, HE Science & Engineering Facility, PX	19,516	27,435	19,953	17,752
07-D-220-04, Transuranic Liquid Waste Facility, LANL	17,053	8,995	0	0
06-D-141, Uranium Processing Facility, Y-12	500,000	515,000	520,000	525,000
04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL	159,615	180,900	216,095	239,600
Total, RTBF Construction	**752,939**	**843,935**	**908,917**	**860,370**
Total, Readiness in Technical Base and Facilities	**1,121,378**	**1,207,290**	**1,285,038**	**1,235,439**
Secure Transportation Asset (STA)				
Operations and Equipment	157,820	162,721	165,954	169,229
Program Direction	108,595	110,647	112,838	115,095
Total, Secure Transportation Asset	**266,415**	**273,368**	**278,792**	**284,324**
Nuclear Counterterrorism Incident Response [a]	**0**	**0**	**0**	**0**
Counterterrorism and Counterproliferation Programs [a]	**0**	**0**	**0**	**0**

[a] The Nuclear Counterterrorism Incident Response Program and the Counterterrorism and Counterproliferation Programs are proposed to be transferred from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation starting in FY 2016.

	(Dollars in Thousands)			
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Infrastructure and Safety [a]				
Operations				
Operations of Facilities				
Kansas City Plant	102,500	104,500	106,802	109,000
Lawrence Livermore National Laboratory	71,590	73,757	78,241	80,157
Los Alamos National Laboratory	198,605	203,936	215,129	219,684
Nevada National Security Site	90,000	91,000	94,000	95,000
Pantex Plant	58,927	60,767	62,663	64,616
Sandia National Laboratory	118,800	121,300	124,700	130,300
Savannah River Site	80,244	82,558	87,969	89,273
Y-12 National Security Complex	125,295	127,629	133,077	136,190
Total, Operations of Facilities	**845,961**	**865,447**	**902,581**	**924,220**
Safety Operations	109,733	112,355	110,760	114,823
Maintenance	227,834	234,591	242,759	255,319
Recapitalization	423,935	214,462	253,108	263,681
Total, Operations	**1,607,463**	**1,426,855**	**1,509,208**	**1,558,043**
Construction				
19-D-xxx Zone 11 High Pressure Fire Loop, PX	0	0	10,000	12,000
19-D-xxx New 138K Power Transmission Event Corridor, NNSS	0	0	15,000	30,000
16-D-623 Electrical Improvements for Nuclear Operations, Y-12	32,000	11,000	25,000	7,000
16-D-622 Electrical Infrastructure Upgrades, LLNL	23,000	0	0	0
16-D-620 Fire Station, Y-12	20,000	0	0	0
15-D-612, Emergency Operatons Center, LLNL	20,000	0	0	0
15-D-611, Emergency Operatons Center, SNL	0	40,000	0	0
Total, Infrastructure and Safety Construction	**95,000**	**51,000**	**50,000**	**49,000**
Total, Infrastructure and Safety [a]	**1,702,463**	**1,477,855**	**1,559,208**	**1,607,043**
Site Stewardship	**36,760**	**37,015**	**37,701**	**38,395**

[a] Formerly part of Readiness in Technical Base and Facilities and Site Stewardship.

	(Dollars in Thousands)			
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Defense Nuclear Security				
Operations and Maintenance	**633,876**	**658,806**	**669,815**	**682,974**
Construction				
14-D-710 DAF Argus, NNSS	13,000	0	0	0
Construction	**13,000**	**0**	**0**	**0**
Total, Defense Nuclear Security	**646,876**	**658,806**	**669,815**	**682,974**
Information Technology and Cybersecurity	**155,032**	**156,751**	**161,984**	**165,993**
Domestic Uranium Enrichment (DUE) Research, Development and Demonstration	**0**	**0**	**0**	**0**
Legacy Contractor Pensions	**206,492**	**157,060**	**87,404**	**87,404**
Use of Prior Year Balances	**0**	**0**	**0**	**0**
Rescission of Prior Year Balances	**0**	**0**	**0**	**0**
Total, Weapons Activities	**9,282,292**	**9,484,527**	**9,717,748**	**9,829,656**

Weapons Activities
Funding by Congressional Control
(Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Directed Stockpile Work					
Life Extension Programs and Major Alterations					
B61 Life Extension Program	537,044	537,044	643,000	643,300	+300
W76 Life Extension Program	248,454	246,394	259,168	244,019	-15,149
W78/88-1 Life Extension Program	0	0	0	0	0
W78 Life Extension Program	38,000	38,000	0	0	0
W88 Alt 370	169,487	169,487	165,400	220,176	+54,776
W80-4 Life Extension Program	0	0	9,418	195,037	+185,619
Total, Life Extension Programs and Major Alterations	**992,985**	**990,925**	**1,076,986**	**1,302,532**	**+225,546**
Stockpile Systems					
B61 Stockpile Systems	83,536	83,245	109,615	52,247	-57,368
W76 Stockpile Systems	47,187	46,940	45,728	50,921	+5,193
W78 Stockpile Systems	54,381	54,047	62,703	64,092	+1,389
W80 Stockpile Systems	50,330	50,185	70,610	68,005	-2,605
B83 Stockpile Systems	54,948	54,697	63,136	42,177	-20,959
W87 Stockpile Systems	101,506	101,186	91,255	89,299	-1,956
W88 Stockpile Systems	62,600	62,332	88,060	115,685	+27,625
Total, Stockpile Systems	**454,488**	**452,632**	**531,107**	**482,426**	**-48,681**
Weapons Dismantlement and Disposition	**54,264**	**51,747**	**50,000**	**48,049**	**-1,951**
Stockpile Services					
Production Support	345,000	337,344	350,942	447,527	+96,585
Research and Development Support	24,928	24,844	25,500	34,159	+8,659
Research and Deveopment Certification and Safety	151,133	150,556	160,000	192,613	+32,613
Managemement, Technology, and Production	214,187	213,361	226,000	264,994	+38,994
Total, Stockpile Services	**735,248**	**726,105**	**762,442**	**939,293**	**+176,851**
Nuclear Material Commodities					
Uranium Sustainment	6,600	6,600	7,400	32,916	+25,516
Plutonium Sustainment	125,048	124,620	132,000	174,698	+42,698
Tritium Sustainment	80,000	83,500	140,053	107,345	-32,708
Domestic Uranium Enrichment	62,000	105,952	97,200	100,000	+2,800
Total, Nuclear Material Commodities	**273,648**	**320,672**	**376,653**	**414,959**	**+38,306**
Total, Directed Stockpile Work	**2,510,633**	**2,542,081**	**2,797,188**	**3,187,259**	**+390,071**

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Research, Development, Test and Evaluation					
Science					
Advanced Certification	58,747	58,631	58,747	50,714	-8,033
Primary Assessment Technologies	92,000	91,682	109,000	98,500	-10,500
Dynamic Materials Properties	104,000	103,696	109,000	109,000	0
Advanced Radiography	29,509	29,438	47,000	47,000	0
Secondary Assessment Technologies	85,467	85,167	88,344	84,400	-3,944
Total, Science	**369,723**	**368,614**	**412,091**	**389,614**	**-22,477**
Engineering					
Enhanced Surety	51,771	51,711	52,003	50,821	-1,182
Weapon Systems Engineering Assessment Technology	23,727	23,709	20,832	17,371	-3,461
Nuclear Survivability	19,504	19,483	25,371	24,461	-910
Enhanced Surveillance	54,909	54,695	37,799	38,724	+925
Total, Engineering	**149,911**	**149,598**	**136,005**	**131,377**	**-4,628**
Inertial Confinement Fusion Ignition and High Yield					
Ignition	80,245	80,005	77,994	73,334	-4,660
Support of Other Stockpile Programs	15,001	14,935	23,598	22,843	-755
Diagnostics, Cryogenics and Experimental Support	59,897	59,483	61,297	58,587	-2,710
Pulsed Power Inertial Confinement Fusion	5,024	5,022	5,024	4,963	-61
Joint Program in High Energy Density Laboratory Plasmas	8,198	8,198	9,100	8,900	-200
Facility Operations and Target Production	345,592	344,751	335,882	333,823	-2,059
Total, Inertial Confinement Fusion Ignition and High Yield	**513,957**	**512,394**	**512,895**	**502,450**	**-10,445**
Advanced Simulation and Computing	**569,329**	**568,633**	**598,000**	**623,006**	**+25,006**
Advanced Manufacturing Development					
Additive Manufacturing	0	0	12,600	0	-12,600
Component Manufacturing Development	55,407	55,205	75,000	112,256	37,256
Process Technology Development	2,400	2,400	19,600	17,800	-1,800
Total, Advanced Manufacturing Development	**57,807**	**57,605**	**107,200**	**130,056**	**+22,856**
Total, RDT&E	**1,660,727**	**1,656,844**	**1,766,191**	**1,776,503**	**+10,312**

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Readiness in Technical Base and Facilities [a]					
Operating					
Operations of Facilities					
Program Readiness	42,259	42,234	49,759	75,185	+25,426
Material Recycle and Recovery	122,600	117,754	126,000	173,859	+47,859
Storage	28,400	28,278	33,400	40,920	+7,520
Recapitalization	28,500	28,500	55,800	104,327	+48,527
Total, Operating	**221,759**	**216,766**	**264,959**	**394,291**	**+129,332**
Construction					
15-D-302, TA-55 Reinvestment Project, Phase 3, LANL	0	0	16,062	18,195	+2,133
15-D-301, HE Science and Engineering Facility, PX	0	0	11,800	0	-11,800
12-D-301, TRU Waste Facilities, LANL	26,722	26,722	6,938	0	-6,938
11-D-801, TA-55 Reinvestment Project, Phase 2, LANL	30,679	30,679	10,000	3,903	-6,097
07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade Project, LANL	45,114	45,114	0	11,533	+11,533
07-D-220-04, Transuranic Liquid Waste Facility, LANL	10,605	10,605	7,500	40,949	+33,449
06-D-140, Project Engineering and Design, VL	0	2,500	0	0	0
06-D-141, Uranium Processing Facility, Y-12	309,000	304,000	335,000	430,000	+95,000
04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL	0	0	35,700	155,610	+119,910
Total, RTBF Construction	**422,120**	**419,620**	**423,000**	**660,190**	**+237,190**
Total, Readiness in Technical Base and Facilities [a]	**643,879**	**636,386**	**687,959**	**1,054,481**	**+366,522**
Secure Transportation Asset (STA)					
Operations and Equipment	112,882	116,382	121,882	146,272	+24,390
Program Direction	97,118	93,618	97,118	105,338	+8,220
Total, Secure Transportation Asset	**210,000**	**210,000**	**219,000**	**251,610**	**+32,610**

[a] Formerly part of Readiness in Technical Base and Facilities and Site Stewardship.

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Infrastructure and Safety					
Operations of Facilities					
Kansas City Plant	135,834	135,502	125,000	100,250	-24,750
Lawrence Livermore National Laboratory	77,287	76,367	71,000	70,671	-329
Los Alamos National Laboratory	213,707	213,707	198,000	196,460	-1,540
Nevada National Security Site	100,929	99,953	89,000	89,000	0
Pantex Plant	81,420	79,334	75,000	58,021	-16,979
Sandia National Laboratory	115,000	119,500	106,000	115,300	+9,300
Savannah River Site	90,236	90,236	81,000	80,463	-537
Y-12 National Security Complex	170,042	165,887	151,000	120,625	-30,375
Total, Operations of Facilities	**984,455**	**980,486**	**896,000**	**830,790**	**-65,210**
Safety Operations	102,001	101,207	92,941	107,701	+14,760
Maintenance	227,591	232,591	227,000	227,000	0
Recapitalization	151,500	151,500	168,800	257,724	+88,924
Construction					
16-D-621, Substation Replacement at TA-3, LANL	0	0	0	25,000	+25,000
15-D-613, Emergency Operations Center, Y-12	0	0	2,000	17,919	+15,919
Total, I&S Construction	**0**	**0**	**2,000**	**42,919**	**+40,919**
Total, Infrastructure and Safety	**1,465,547**	**1,465,784**	**1,386,741**	**1,466,134**	**+79,393**
Site Stewardship					
Nuclear Materials Integration	12,676	12,485	13,300	17,510	+4,210
Corporate Project Management	9,118	9,118	0	0	0
MSI Partnership Program	14,531	14,531	14,531	19,085	+4,554
Total, Site Stewardship	**36,325**	**36,134**	**27,831**	**36,595**	**+8,764**
Defense Nuclear Security					
Operations and Maintenance	**664,981**	**658,663**	**636,123**	**619,891**	**-16,232**
Construction					
14-D-710, DAF Argus, NNSS	0	0	0	13,000	+13,000
08-D-701, Nuclear Materials S&S Upgrade Project, Phase 2, LANL	0	480	0	0	0
Total, Defense Nuclear Security	**664,981**	**659,143**	**636,123**	**632,891**	**-3,232**

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Information Technology and Cybersecurity	**145,068**	**144,442**	**179,646**	**157,588**	**-22,058**
Legacy Contractor Pensions	**279,597**	**335,490**	**307,058**	**283,887**	**-23,171**
Subtotal, Weapons Activities	**7,616,757**	**7,686,304**	**8,007,737**	**8,846,948**	**+839,211**
Total, Weapons Activities					
Use of Prior Year Balances	**0**	**-60,628**	**0**	**0**	**0**
Rescission of Prior Year Balances	**-64,000**	**-64,000**	**-51,411**	**0**	**51,411**
Total Weapons Activities, Net of Rescission	**7,552,757**	**7,561,676**	**7,956,326**	**8,846,948**	**+890,622**

Comparability Matrix
Weapons Activities
FY 2015 Structure crosswalked to Proposed FY 2016 Structure
(Dollars in Thousands)

	Proposed FY 2016 Budget Structure																	
	RTBF						DSW					Site Stewardship			Infrastructure and Safety					
	Program Readiness	Material, Recycle and Recovery	Storage	Recapitalization	Construction	**Total, RTBF**	Nuclear Material Commodities - Domestic Uranium Enrichment	Nuclear Material Commodities - Tritium Sustainment	Nuclear Material Commodities - Plutonium Sustainment	Nuclear Material Commodities - Uranium Sustainment	**Total, Nuclear Material Commodities**	Nuclear Materials Integration	Minority Serving Institution Partnerships Program	**Total, Site Stewardship**	Operations of Facilities	Safety Operations	Maintenance	Recapitalization	Construction	**Total, Infrastructure and Safety**
FY 2015 Budget Structure (current)																				
Readiness in Technical Base and Facilities (RTBF)																				
Operating																				
Operations of Facilities																				
Kansas City Plant						**0**					**0**			**0**	100,250					**100,250**
Lawrence Livermore National Laboratory						**0**					**0**			**0**	70,671					**70,671**
Los Alamos National Laboratory						**0**					**0**			**0**	196,460					**196,460**
Nevada National Security Site						**0**					**0**			**0**	89,000					**89,000**
Pantex						**0**					**0**			**0**	58,021					**58,021**
Sandia National Laboratory						**0**					**0**			**0**	115,300					**115,300**
Savannah River Site						**0**					**0**			**0**	80,463					**80,463**
Y-12 National Security Complex						**0**					**0**			**0**	120,625					**120,625**
Total, Operations of Facilities						**0**					**0**			**0**	**830,790**					**830,790**
Program Readiness	75,185					**75,185**					**0**			**0**		27,785				**27,785**
Material, Recycle and Recovery		173,859				**173,859**				9,458	**9,458**			**0**						**0**
Containers						**0**					**0**			**0**		27,701				**27,701**
Storage			40,920			**40,920**				13,458	**13,458**			**0**						**0**
Maintenance and Repair of Facilities						**0**					**0**			**0**			227,000			**227,000**
Recapitalization				104,327		**104,327**				10,000	**10,000**			**0**				257,724		**257,724**
Total, Operating						**394,291**				**32,916**	**32,916**			**0**						**1,371,000**
Total, RTBF: Construction					660,190	**660,190**				**0**	**0**			**0**					42,919	**42,919**
Total, Readiness in Technical Base and Facilities	75,185	173,859	40,920	104,327	660,190	**1,054,481**				**32,916**	**32,916**	0	0	**0**	830,790	55,486	227,000	257,724	42,919	**1,413,919**
Site Stewardship																				
Environmental Projects and Operations						**0**					**0**			**0**		52,215				**52,215**
Nuclear Materials Integration						**0**					**0**	17,510		**17,510**						**0**
Corporate Project Management						**0**					**0**			**0**						**0**
Minority Serving Institution Partnerships Program						**0**					**0**		19,085	**19,085**						**0**
Total, Site Stewardship	0	0	0	0	0	**0**					**0**	17,510	19,085	**36,595**	0	52,215	0	0	0	**52,215**
Domestic Uranium Enrichment (DUE) Research, Development and Demostration						**0**	100,000				**100,000**			**0**						**0**
											0									
Directed Stockpile Work											**0**									
Stockpile Services											**0**									
Production Support											**0**									
Research & Development Support											**0**									
Research & Development Certification and Safety									174,698		**174,698**									
Management, Technology and Production											**0**									
Plutonium Sustainment								107,345			**107,345**									
Plutonium Infrastructure Sustainment											**0**									
Tritium Readiness											**0**									
Total, Stockpile Services							100,000	107,345	174,698	0	**414,959**									
Total, RTBF, Site Stewardship, DUE and Stockpile Services	**75,185**	**173,859**	**40,920**	**104,327**	**660,190**	**1,054,481**	**100,000**	**107,345**	**174,698**	**32,916**	**414,959**	**17,510**	**19,085**	**36,595**	**830,790**	**107,701**	**227,000**	**257,724**	**42,919**	**1,466,134**

Research and Development

The Office of Management and Budget (OMB) Circular No. A-11, "Preparation, Submission, and Execution of the Budget," dated July 2013, requires the reporting of research and development (R&D) data. Consistent with this requirement, R&D activities funded by NNSA are displayed below.

(Dollars in Thousands)

	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2015 vs FY 2016
Research and Development (R&D)				
Basic	3,800	3,157	0	(3,157)
Applied	2,820,484	2,677,586	2,544,016	(133,570)
Development	682,548	556,798	471,432	(85,366)
Subtotal, R&D	**3,506,832**	**3,237,514**	**3,015,448**	**(222,093)**
Equipment	84,854	86,720	88,628	+1,023
Construction	2,800	0	0	+0
Total, R&D	**3,594,486**	**3,413,712**	**3,485,670**	**(220,185)**

Directed Stockpile Work (DSW)

Overview

The Directed Stockpile Work (DSW) program encompasses major activities that wholly sustain the nuclear weapons stockpile. DSW precisely contributes to meeting the Department of Energy's (DOEs) first strategic goal under "Nuclear Security". This contribution fulfills a critical role in meeting DOE Strategic Objective 4 which is to "Maintain the safety, security and effectiveness of the nation's nuclear deterrent without nuclear testing."

DSW executes the program pursuant to the direction given in the President's Nuclear Weapon Stockpile Plan (NWSP). In doing so, DSW: (1) provides unique skills, equipment, testers, and logistics to enable nuclear weapons operations; (2) efficiently extends the life of existing weapons systems through authorized modifications to address technical issues and enhance their safety, security, and effectiveness; (3) develops, produces and replaces limited life components (LLCs); (4) conducts scheduled weapons maintenance; (5) conducts surveillance and evaluations to assess weapons reliability as well as detect and anticipate potential weapons issues; (6) quantifies margins of uncertainty in order to assess and certify the nuclear stockpile; (7) develops options for enhanced safety, security, and effectiveness for insertion into current modifications/alterations; (8) provides dismantlement and disposition of weapons and components for weapons retired from the stockpile, thereby supporting nonproliferation and international goals; (9) compiles and analyzes information during the Annual Assessment process to identify and address potential issues; (10) develops the next generation of technologies (neutron generators (NGs), gas transfer systems (GTSs), code management systems, power sources, etc.) for multiple system applications to reduce life cycle costs while leveraging against near term and long term stockpile development needs; (11) enhances NNSA transportation security by implementing new weapon shipping configurations developed by the Integrated Surety Architectures (ISA) program (Modifications to the safeguards transporter vehicles and common multi-application transportation attachment devices for all air-delivered weapons are funded by Research Development Certification and Safety. Tail-number unique products like the W88 Alt 370 ISA shipping configuration will be funded by the appropriate Stockpile System account.); (12) sustains the uranium and plutonium capabilities to meet long-term national requirements; (13) produces tritium necessary for the national inventory and the increased capacity required for the nuclear weapons mission; and (14) supports development of a reliable and economic domestic uranium enrichment capability.

DSW fulfills the above responsibilities through five subprograms: (1) Life Extension Programs (LEPs) and Major Alterations (Alts), which extend the lifetime of the nation's nuclear stockpile and enable the nuclear security enterprise to respond to threats of the 21st century without developing new weapon systems; (2) Stockpile Systems, which directly executes sustainment activities for all enduring weapons systems in the stockpile (B61, W76, W78, W80, B83, W87, and W88); (3) Weapons Dismantlement and Disposition (WDD), which oversees the removal of retired weapons and components from the stockpile; (4) Stockpile Services, which provides the foundation skills and capabilities for the research, development, production, and maintenance within the nuclear security enterprise to meet national requirements; and (5) Nuclear Material Commodities which ensures sustainment of nuclear material processing capabilities within the nuclear security enterprise to meet national requirements.

The Department of Energy's Directed Stockpile Work (DSW) budget request for FY 2016 is $3,187,259,000. This represents a 13.9% or $390,071,000 increase above the comparable FY 2015 Consolidated Appropriations Act. A new Nuclear Material Commodities (NMC) subprogram is established in FY 2016. This subprogram is comprised of a new Uranium Sustainment activity, the transfer of Plutonium Sustainment and Tritium Sustainment from Stockpile Services, and the transfer of Domestic Uranium Enrichment (DUE) from Weapons Activities. In the LEPs, there is an increase of $225,546,000 which primarily represents $54,776,000 for W88 ALT 370 activities, $185,619,000 for the W80-4 LEP, and a transfer of $15,149,000 from the W76-1 LEP to the W88 ALT 370 for Conventional High Explosive (CHE) Refresh activities. In Stockpile Systems, the $48,681,000 decrease primarily represents a $50,443,000 transfer of funds to Production Support for the transition to the new NG cost model; a decrease of $47,000,000 from the B61 and B83 for CHE Refresh activities; an increase in ISA funding for the W88 of $31,000,000; and an increase of $17,800,000 for direct Weapon Systems NG activities. The Weapons Dismantlement and Disposition (WDD) program decrease of $1,951,000 is offset by the increase enacted in the FY 2015 Consolidated Appropriations Act. NNSA will meet the FY 2022 WDD goal of eliminating weapons retired prior to FY 2009. Stockpile Services increased overall by $176,851,000 due to a Production Support increase of $96,585,000 for the NG cost model and deferred maintenance; a R&D Support increase of $8,659,000 to upgrade computers and software; a RDCS increase of $32,613,000 for multi-system technology development; an MTP increase of

$38,994,000 that funds additional required multi-system surveillance activities. The $38,306,000 increase to Nuclear Material Commodities (NMC) includes an increase to Uranium Sustainment of $25,516,000 to sustain the uranium mission; an increase to Plutonium Sustainment of $42,698,000 for pit manufacturing and certification capability; a decrease to Tritium Sustainment of $32,708,000 due to decreased fuel deliveries; and an increase to Domestic Uranium Enrichment of $2,800,000 to maintain the current state.

FY 2016 funding for the Pantex and Y-12 Sites incorporate a change in the site's cost model for all NNSA programs, and a reduced fee rate under the Consolidated Nuclear Security (CNS) contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution. For DSW, there are CNS cost model funding increases offset by other decreases for CNS within NNSA that do not change program scope.

Highlights of the FY 2016 Budget Request

Life Extension Programs and Major Alterations

- Transition life extension activities from Phase 6.3 development engineering to Phase 6.4 production engineering in accordance with the integrated schedule to continue progress towards an FY 2020 B61-12 LEP first production unit.
- Execute the W76-1 LEP to meet the current deliverables in agreement with the Department of the Navy and in sustainment of submarine deployment requirements.
- Execute the W88 ALT 370 which will address lifetime requirements by modernizing the Arming, Fuzing, and Firing (AF&F) system, improving surety, and incorporating a lightning arrestor connector and refresh of the CHE. It will also provide required logistical spares for maintaining the life of the system.
- The W80-4 LEP, previously titled Cruise Missile Warhead LEP, continues in Phase 6.2 of the weapon development cycle with an accelerated first production unit (from FY 2027 to FY 2025) in support of the Air Force Long Range Stand Off (LRSO) program.

Stockpile Systems

- Complete production and delivery of all scheduled LLCs for the B61, W76, W78, W80, B83, W87, and W88. LLCs include GTSs, NGs, and alteration kits delivered to the Department of Defense (DoD) and the Pantex Plant to maintain the nuclear weapons stockpile.
- Conduct surveillance programs for all weapon systems using data collection from flight tests, laboratory tests, and component evaluations sufficient to assess stockpile reliability without nuclear testing.
- Complete all Annual Assessment Reports and Laboratory Director Letters to the President.
- For the B61 and B83, there is a reduction to stockpile requirements (for example bombs maintenance activities, surveillance activities, and development studies), that will enable a transfer of funds ($47,000) from the bombs to support the W88 CHE Refresh activities.
- Begin implementation of ISA technologies for the W88 Stockpile System.
- The NG Cost Model funding transfer $50,443,000 to Production Support from Stockpile Systems represents the transition to the new NG cost model, that previously tied a portion of the NG infrastructure costs to weapon program funding.

Weapons Dismantlement and Disposition

- Continue on schedule to meet the NNSA goal of eliminating all weapons retired prior to FY 2009 by FY 2022.

Stockpile Services

- Provide the foundation for capabilities and capacity within the nuclear security enterprise necessary to sustain Directed Stockpile Work activities.
- Complete Annual Assessment Cycle for the active stockpile.
- Initiate the Integrated Surety Architectures (ISA) multi-application product development.
- Support multiple-system technology development and exploratory studies to address current and emerging stockpile issues as well as replace limited life components (LLCs) and sunset technologies, such as (e.g., Neutron Generators (NGs); Nuclear Explosive Package (NEP); GTS; AFF; and initiation systems).
- Operate and maintain the Joint Integrated Lifecycle Surety (JILS) tool to evaluate potential surety improvements to the nuclear security enterprise.

- Continue the archiving of weapons data and upgrade of R&D and engineering tools to remain current with evolving technologies.
- The NG Cost Model funding transfer of $50,443,000 to Production Support from Stockpile Systems represents the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding.

Nuclear Material Commodities
- Uranium Sustainment – Expand and accelerate Area 5 De-inventory efforts to reduce safety and security risks.
- Uranium Sustainment – Sustain and increase the reliability of uranium capabilities to reduce mission risks.
- Plutonium Sustainment – Fabricate four to five development (DEV) W87 pits.
- Tritium Sustainment – Complete irradiation of 704 Tritium-Producing Burnable Absorbing Rods (TPBARS) in Watts Bar Unit 1 (WBN1) Cycle 13.
- Tritium Sustainment – Complete irradiation of 704 TPBARs in WBN1 in Cycle 14; and receive approval of license amendment request from the Nuclear Regulatory Commission to increase production in Cycle 15.
- Domestic Uranium Enrichment (DUE) – Complete analyses of available unobligated and unencumbered low enriched uranium (LEU), tritium needs, and suitable high enriched uranium (HEU) for down blending.
- DUE – Continue to preserve the option to continue operating a centrifuge research, development and demonstration project.
- DUE – Continue to explore the technological readiness and financial viability of other enrichment technologies.
- DUE – The program will follow interagency guidance to transition to an operations and maintenance mission in FY 2016.

Major Outyear Priorities and Assumptions

Outyear funding levels for DSW total $14,368,656,000 for FY 2017 through FY 2020. The priorities for DSW are:

Life Extension Programs and Major Alterations
- Execute the W76-1 LEP and B61-12 LEP.
- Execute W88 Alt 370 and CHE Refresh activities.
- Continue nuclear weapons refurbishment activities through the 6.X process for the W80-4 LEP (Titled Cruise Missile Warhead Life Extension Study in the FY 2015 President's Budget Request in coordination with the Air Force LRSO program.)
- Re-start the W78/88-1 LEP activities in FY 2020.

Stockpile Systems
- Complete production and delivery of all scheduled LLCs for the active stockpile. LLCs include GTSs, NGs, and alteration kits delivered to the DoD and the Pantex Plant to maintain the nuclear weapons stockpile.
- Conduct surveillance programs for all weapon systems using data collection from flight tests, laboratory tests, and component evaluations sufficient to assess stockpile reliability without nuclear testing.
- Complete all Annual Assessment Reports and Laboratory Director Letters to the President.
- Continue implementation of ISA configurations for the W88 Stockpile System.
- Begin implementation of ISA configurations for the W76 and W78 Stockpile Systems.

Weapons Dismantlement and Disposition
- Maintain progress towards NNSA goal of eliminating all weapons retired prior to FY 2009 by FY 2022.

Stockpile Services
- Continue to provide the foundation for capabilities and capacity within the nuclear security enterprise necessary to sustain Directed Stockpile Work activities.
- Continue ongoing activities that directly support the internal design laboratory site-specific research and development (R&D) activities. This includes management activities that support stockpile studies and programmatic work for multiple systems or non-weapon specific systems.
- Continue ongoing activities that support the stockpile by designing and developing limited life components not directly attributable to a specific warhead, such as NGs, GTSs, and other components, and surety development.

- Continue to perform hydrodynamic test and subcritical experiments that support the stockpile and LEPs.
- Continue to support the Annual Assessment process.
- Continue to analyze, evaluate, and close high priority SFIs in accordance with the currently approved baseline closure plans.
- In accordance with the Technical Basis for Stockpile Transformation Planning (TBSTP), continue assessing and prioritizing needed technologies to maintain base capabilities of the enduring stockpile weapons.
- Continue to implement ISA configurations for the air delivered systems.
- Implement ISA activities for the NNSA Safeguards Transporter Fleet.

Nuclear Material Commodities

- Uranium Sustainment – Continue reducing safety and security risks through the Y-12 Area 5 De-inventory efforts by further accelerating the movement of weapon assemblies and materials to the Highly Enriched Uranium Materials Facility, performing additional safety analysis and material characterization in support of material disposition, and re-engineering process flows to stop the flow of material into Building 9212.
- Uranium Sustainment – Support additional efforts to sustain and increase the reliability of uranium capabilities through the replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts.
- Plutonium Sustainment – Continue to invest in manufacturing equipment (acquire, install, configure and authorize for operation) to replace an aging base capability for pits while progressing towards the development, qualification, and certification of W87 pit manufacturing processes.
- Tritium Sustainment – Continue to provide an assured supply of tritium to meet national defense needs and increase production capacity necessary to meet future national security requirements.
- DUE – Continue to support the development of a domestic supply of enriched uranium for the USG without peaceful use restrictions; providing uranium to support the tritium production mission as well as varying uranium assays and forms to maintain the nuclear weapons stockpile.

FY 2014 Accomplishments

Life Extension Programs and Major Alterations

- Completed over 20 B61-12 LEP system-level joint, ground and aircraft integration tests utilizing functional development hardware.
- Successfully completed the first integration testing of B61-12 LEP bomb assembly and tail kit assembly with two aircraft platform interface.
- Successfully executed the first six Vibration Fly Around/Instrumented Measurement Unit flights for the B61-12 LEP to validate flight environments.
- Completed all scheduled deliveries for the W76-1 LEP to the Department of the Navy, and completed recovery of the FY 2013 War Reserve Build requirements.
- Continued W88 Alt 370, design and fabrication of prototype functional hardware, components, sub-assemblies and Arming, Fuzing & Firing (AF&F) level qualification testing.
- Approved and initiated implementation of five W88 Alt 370 directed baseline changes.
- Initiated early W88 ALT 370 production process development.
- Initiated the first W88 Alt 370 Life of Program purchases resulting in long term savings.
- Completed two W88 Alt 370 development flight tests (the Critical Radar Assembly Flight Test (CRAFT) and Follow-on Commanders Evaluation Test -50).
- Completed the W88 CHE Refresh directed baseline change planning, design, material down-select, development hardware fabrication, and testing authorized in FY2014 by NWC directed baseline change.
- For the W78/88-1 LEP, completed down select activities, USAF W78 customer requirements review, and orderly close-out of LEP activities until restart in FY 2020.
- Initiated Phase 6.1 concept study activities in accordance with the weapon development cycle for the W80-4 (Cruise Missile Warhead) LEP.
- Completed a NWC approved down-select to the W80 warhead for the W80-4 LEP.

Stockpile Systems

- Delivered all scheduled LLCs for the B61, W76, W78, W80, B83, W87, and W88. LLCs include GTSs, NGs, and alteration kits delivered to the DoD and the Pantex Plant to maintain the nuclear weapons stockpile.
- Conducted surveillance programs for all weapon systems using data collection from flight tests, laboratory tests, and component evaluations sufficient to assess stockpile reliability without nuclear testing. Surveillance culminated in completing all Annual Assessment Reports and Laboratory Director Letters to the President.
- Completed ALT 353 (gas transfer system) design activities for the B83 and initiated the life storage program.
- Successfully conducted the B61 cable pull down test.
- Achieved the First Production Unit for the Small Ferroelectric Neutron Generator for the W87 program, and began deliveries to DoD.

Weapons Dismantlement and Disposition

- At the end of FY 2014, the Weapons Dismantlement and Disposition (WDD) program was on schedule to complete dismantlement of weapons retired prior to FY 2009 by the end of FY 2022.
- WDD developed several dismantlement scenarios to eliminate any gaps in dismantlement due to further stockpile reductions.
- WDD is meeting the Navy's expectations to return W76-0 warheads early. This cost avoidance action will save the Navy several million dollars in weapon staging costs.

Stockpile Services

- Developed a more accurate method to ensure nuclear explosives are initiated uniformly. This development was a collaborative effort with Argonne National Laboratory (ANL) and can be applied to multiple-system technologies.
- Supported development and realization of several major projects including the B61-12, W76-1, W88 ALT 370, and ISA.
- Performed analyses in conjunction with the DoD to support key surety decisions for both NNSA and the DoD; and added new capabilities to accommodate cyber and insider threats.
- Successfully completed an extraction of 300 TPBARs at the Tritium Extraction Facility (TEF) in the third quarter of FY 2014.
- Completed one shipment of TPBARS from WBN1 Cycle 12 to the TEF.
- Demonstrated gas transfer system design meets key DoD requirements and initiating pre-production activities ahead of schedule.
- Successfully fired a hydrodynamic test at the Los Alamos National Laboratory (LANL) Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT) as part of the W88 legacy and Alt 370 qualification effort.
- Archived past weapons data and converted sunset technology files to state-of-the-art data storage/security systems.
- Completed seven planned JASPER plutonium shots, five Phoenix experiments, and one weapon system hydrodynamic experiment. Completed the Annual Assessment Process and Independent Nuclear Weapon Assessment Process (INWAP) activities.
- Submitted Weapons Reliability Reports to DoD.
- Provided direct support to Stockpile Systems (W80 and B83) for flight tests and development for new HE explosives for flight test diagnostics and qualification activities.
- Issued the revised W87 Development Pit Build Plan that detailed the experimental matrix with pit production rates at four to five pits per year (PPY) through FY 2018.
- Designed a broadly based Integrated Surety Architectures (ISA) program to address postulated security concerns associated with NNSA transportation.

Directed Stockpile Work
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Directed Stockpile Work					
Life Extension Programs and Major Alterations					
B61 Life Extension Program	537,044	537,044	643,000	643,300	+300
W76 Life Extension Program	248,454	246,394	259,168	244,019	-15,149
W78/88-1 Life Extension Program	0	0	0	0	0
W78 Life Extension Program	38,000	38,000	0	0	0
W88 Alt 370	169,487	169,487	165,400	220,176	+54,776
Cruise Missile Warhead Life Extension Program	0	0	9,418	0	-9,418
W80-4 Life Extension Program	0	0	0	195,037	+195,037
Total, Life Extension Programs and Major Alterations	**992,985**	**990,925**	**1,076,986**	**1,302,532**	**+225,546**
Stockpile Systems					
B61 Stockpile Systems	83,536	83,245	109,615	52,247	-57,368
W76 Stockpile Systems	47,187	46,940	45,728	50,921	+5,193
W78 Stockpile Systems	54,381	54,047	62,703	64,092	+1,389
W80 Stockpile Systems	50,330	50,185	70,610	68,005	-2,605
B83 Stockpile Systems	54,948	54,697	63,136	42,177	-20,959
W87 Stockpile Systems	101,506	101,186	91,255	89,299	-1,956
W88 Stockpile Systems	62,600	62,332	88,060	115,685	+27,625
Total, Stockpile Systems	**454,488**	**452,632**	**531,107**	**482,426**	**-48,681**
Weapons Dismantlement and Disposition	**54,264**	**51,747**	**50,000**	**48,049**	**-1,951**
Stockpile Services					
Production Support	345,000	337,344	350,942	447,527	+96,585
Research and Development Support	24,928	24,844	25,500	34,159	+8,659
Research and Deveopment Certification and Safety	151,133	150,556	160,000	192,613	+32,613
Managemement, Technology, and Production	214,187	213,361	226,000	264,994	+38,994
Plutonium Sustainment	0	0	132,000	0	-132,000
Plutonium Infrastructure Sustainment	125,048	124,620	0	0	0
Tritium Readiness	80,000	83,500	140,053	0	-140,053
Total, Stockpile Services	**940,296**	**934,225**	**1,034,495**	**939,293**	**-95,202**
Nuclear Material Commodities					
Uranium Sustainment	0	0	0	32,916	+32,916
Plutonium Sustainment	0	0	0	174,698	+174,698
Tritium Sustainment	0	0	0	107,345	+107,345
Domestic Uranium Enrichment	0	0	0	100,000	+100,000
Total, Nuclear Material Commodities	**0**	**0**	**0**	**414,959**	**+414,959**

Directed Stockpile Work
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Directed Stockpile Work					
Life Extension Programs and Major Alterations					
B61 Life Extension Program	537,044	537,044	643,000	643,300	+300
W76 Life Extension Program	248,454	246,394	259,168	244,019	-15,149
W78/88-1 Life Extension Program	0	0	0	0	0
W78 Life Extension Program	38,000	38,000	0	0	0
W88 Alt 370	169,487	169,487	165,400	220,176	+54,776
W80-4 Life Extension Program	0	0	9,418	195,037	+185,619
Total, Life Extension Programs and Major Alterations	**992,985**	**990,925**	**1,076,986**	**1,302,532**	**+225,546**
Stockpile Systems					
B61 Stockpile Systems	83,536	83,245	109,615	52,247	-57,368
W76 Stockpile Systems	47,187	46,940	45,728	50,921	+5,193
W78 Stockpile Systems	54,381	54,047	62,703	64,092	+1,389
W80 Stockpile Systems	50,330	50,185	70,610	68,005	-2,605
B83 Stockpile Systems	54,948	54,697	63,136	42,177	-20,959
W87 Stockpile Systems	101,506	101,186	91,255	89,299	-1,956
W88 Stockpile Systems	62,600	62,332	88,060	115,685	+27,625
Total, Stockpile Systems	**454,488**	**452,632**	**531,107**	**482,426**	**-48,681**
Weapons Dismantlement and Disposition	**54,264**	**51,747**	**50,000**	**48,049**	**-1,951**
Stockpile Services					
Production Support	345,000	337,344	350,942	447,527	+96,585
Research and Development Support	24,928	24,844	25,500	34,159	+8,659
Research and Deveopment Certification and Safety	151,133	150,556	160,000	192,613	+32,613
Managemement, Technology, and Production	214,187	213,361	226,000	264,994	+38,994
Plutonium Sustainment	0	0	0	0	0
Plutonium Infrastructure Sustainment	0	0	0	0	0
Tritium Readiness	0	0	0	0	0
Total, Stockpile Services	**735,248**	**726,105**	**762,442**	**939,293**	**+176,851**
Nuclear Material Commodities					
Uranium Sustainment	6,600	6,600	7,400	32,916	+25,516
Plutonium Sustainment	125,048	124,620	132,000	174,698	+42,698
Tritium Sustainment	80,000	83,500	140,053	107,345	-32,708
Domestic Uranium Enrichment	62,000	105,952	97,200	100,000	+2,800
Total, Nuclear Material Commodities	**273,648**	**320,672**	**376,653**	**414,959**	**+38,306**
Total, Directed Stockpile Work	**2,510,633**	**2,542,081**	**2,797,188**	**3,187,259**	**+390,071**

Outyears for Directed Stockpile Work
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Directed Stockpile Work				
Life Extension Programs and Major Alterations				
B61 Life Extension Program	623,402	734,905	733,546	760,820
W76 Life Extension Program	227,288	228,148	119,824	27,800
W78/88-1 Life Extension Program	0	0	0	112,808
W78 Life Extension Program	0	0	0	0
W88 Alt 370	232,898	224,546	219,679	218,322
W80-4 Life Extension Program	312,240	407,270	473,760	459,346
Total, Life Extension Programs and Major Alterations	**1,395,828**	**1,594,869**	**1,546,809**	**1,579,096**
Stockpile Systems				
B61 Stockpile Systems	52,580	53,714	50,760	51,869
W76 Stockpile Systems	45,119	43,928	61,291	77,773
W78 Stockpile Systems	60,916	63,957	62,246	79,939
W80 Stockpile Systems	64,520	72,848	65,632	66,877
B83 Stockpile Systems	42,174	37,691	36,083	22,581
W87 Stockpile Systems	83,044	82,832	77,553	79,925
W88 Stockpile Systems	123,651	159,963	172,860	165,298
Total, Stockpile Systems	**472,004**	**514,933**	**526,425**	**544,262**
Weapons Dismantlement and Disposition	**48,274**	**49,990**	**52,370**	**51,773**
Stockpile Services				
Production Support	462,642	475,200	515,273	494,669
Research and Development Support	43,453	46,284	52,737	53,776
Research and Deveopment Certification and Safety	207,178	247,401	259,812	262,018
Managemement, Technology, and Production	255,203	277,763	331,532	325,821
Plutonium Sustainment	0	0	0	0
Plutonium Infrastructure Sustainment	0	0	0	0
Tritium Readiness	0	0	0	0
Total, Stockpile Services	**968,476**	**1,046,648**	**1,159,354**	**1,136,284**
Nuclear Material Commodities				
Uranium Sustainment	30,700	29,191	27,800	29,892
Plutonium Sustainment	179,888	141,069	155,767	176,557
Tritium Sustainment	126,821	140,182	120,444	122,950
Domestic Uranium Enrichment	100,000	100,000	100,000	100,000
Total, Nuclear Material Commodities	**437,409**	**410,442**	**404,011**	**429,399**
Total, Directed Stockpile Work	**3,321,991**	**3,616,882**	**3,688,969**	**3,740,814**

Directed Stockpile Work
Proposed Budget Structure Changes
(Dollars in Thousands)

In FY 2016, NNSA proposes to restructure the DSW activities to consolidate non-MIE investments necessary to reduce safety, security, and mission risks, sustain the uranium mission, and support ceasing enriched uranium programmatic operations in Building 9212 by 2025. Organizing DSW into five subprograms will strengthen program effectiveness while recognizing the investment needed in nuclear materials to maintain the viability of the enduring stockpile. In addition, elements of Readiness in Technical Base and Facilities and DUE are also integrated into the Nuclear Material Commodities program.

	Proposed FY 2016 Budget Structure Nuclear Materials Commodities				
	Uranium Sustainment	Plutonium Sustainment	Tritium Sustainment	Domestic Uranium Enrichment	Total
FY 2015 Budget Structure					
Weapons Activities					
Directed Stockpile Work					
Stockpile Services					
Plutonium Sustainment		174,698			174,698
Tritium Readiness			107,345		107,345
Total, Stockpile Services		174,698	107,345		282,043
Readiness in Technical Base and Facilities					
Material Recycle and Recovery	9,458				9,458
Storage	13,458				13,458
Recapitalization	10,000				10,000
Total, Operating					32,916
Total Readiness in Technical Base and Facilities	32,916				32,916
Domestic Uranium Enrichment (DUE)					
DUE Research, Development and Demonstration				100,000	100,000
Total Domestic Uranium Enrichment	0	0	0	100,000	100,000
Total, Directed Stockpile Work	**32,916**	**174,698**	**107,345**	**100,000**	**414,959**

Directed Stockpile Work
Explanation of Major Changes
(Comparable)
(Dollars in Thousands)

	FY 2016 vs. FY 2015
Life Extension Programs and Major Alterations: The $225,546 increase primarily represents an increase of $54,776 for W88 ALT 370 activities and an increase of $185,619 for the W80-4. $15,149 of the $185,619 increase is a transfer from the W76-1 LEP to the W88 ALT 370 for Conventional High Explosive (CHE) activities.	**+$225,546**
Stockpile Systems: The $48,681 decrease primarily represents a transfer to Production Support for the transition to the new NG cost model, that previously tied a portion of the Neutron Generator (NG) infrastructure costs to weapons program funding; a decrease of $47,000 for the B61 and B83 due to a reduction to stockpile requirements (for example bombs maintenance activities, surveillance activities, and development studies) to fund CHE activities; an increase in ISA funding for the W88 of $31,000; and an increase of $17,761 for direct Weapon Systems NG activities.	**-$48,681**
Weapons Dismantlement and Disposition: The $1,951 decrease will be offset by anticipated FY 2015 carryover due to a funding increase in the FY 2015 Omnibus. NNSA will meet the FY 2022 goal of eliminating weapons retired prior to 2009. This includes nuclear weapon and canned sub-assemblies (CSA) dismantlement scope. The decrease will not impact legacy weapons parts disposition and safety testing for systems in retirement.	**-$1,951**
Stockpile Services: The Production Support increase of $96,585 funds the transition to the new NG cost model and deferred maintenance at Y-12. The Research & Development (R&D) Support increase of $8,659 funds upgrades to computers, software, and tooling; and the $32,613 increase in Research and Development Certification and Safety (RCDS) funds additional multi-system technology development activities, continuing hydrodynamic and dynamic plutonium experiments, additional analysis to support the Independent Nuclear Weapon Assessment Process (INWAP), and additional stockpile studies. The increase of $38,994 in MTP funds additional required multi-system surveillance activities and tooling upgrades.	**+$176,851**
Nuclear Material Commodities: The $38,306 increase includes $25,516 for Uranium Sustainment to sustain the uranium mission and cease operations in Building 9212 by 2025; an increase to Plutonium Sustainment of $42,698 for pit manufacturing and certification capability; a decrease to Tritium Sustainment of $32,708 due to decreased fuel deliveries; and an increase to Domestic Uranium Enrichment of $2,800 to maintain the current state.	**+$38,306**
Total, Directed Stockpile Work	**+390,071**

DSW Internal Funding Transfer Table
(Dollars in Thousands)

The Neutron Generator (NG) Cost Model transfers $50,443 of funding to Production Support (PS) from Stockpile Systems for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding. Integrated Surety Architecture (ISA) transfers ISA Research Development Certification and Safety (RDCS) funding to the Stockpile Systems to conduct activities for surety enhancements, to include implementation of the ISA technologies.

NG Cost Model Transfers	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
B61 Stockpile Systems	-908	-1,733	-5,425	-9,364	-19,965
W76 Stockpile Systems	-14,095	-9,303	-1,156	0	0
W78 Stockpile Systems	-1,362	0	0	0	0
W80 Stockpile Systems	-16,433	-21,632	-14,755	-1,598	-643
B83 Stockpile Systems	0	-1,238	-3,647	-,6769	-10,451
W87 Stockpile Systems	-16,146	-11,772	-11,374	-11,146	0
W88 Stockpile Systems	-1,500	-4,566	-14,236	-21,900	-20,075
Total Stockpile Systems	**-50,443**	**-50,244**	**-50,594**	**-50,778**	**-51,133**
Production Support	**50,443**	**50,244**	**50,594**	**50,778**	**51,133**

ISA Transfers	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
W76 Stockpile Systems	0	0	0	13,200	28,900
W78 Stockpile Systems	0	0	0	0	16,300
W87 Stockpile Systems	0	0	0	0	0
W88 Stockpile Systems	31,000	40,900	39,000	48,200	38,300
Total Stockpile Systems	**31,000**	**40,900**	**39,000**	**61,400**	**83,500**
RDCS	**-31,000**	**-40,900**	**-39,000**	**-61,400**	**-83,500**

Directed Stockpile Work
Life Extension Programs and Major Alterations

Description

Life Extension Programs (LEPs) and Major Alterations is the stockpile management program activity necessary to extend the expected life of stockpile systems for an additional 20 to 30 years. The NNSA, in conjunction with the DoD, executes an LEP following the procedural guidelines of the Phase 6.X process that provides a framework to conduct and manage refurbishment activities for existing weapons. For the purposes of this justification, the term "refurbishment" refers to all nuclear weapon alterations and modifications to include life extension, modernization, and revised military requirements. It makes the maximum use of the established structure, flow, and practices from the traditional phased process for new warheads. It is not intended to replace Phase 6 (Quantity Production and Stockpile) activities such as routine maintenance, stockpile evaluation, enhanced surveillance, baselining, and annual certification. Therefore, this process is actually an expanded subset of the Quantity Production and Stockpile phase (Phase 6) of the traditional process and has accordingly been termed the Phase 6.X process. Phase 6.1 (Concept Assessment) should provide sufficient information for the Nuclear Weapon Council to authorize Phase 6.2 (Feasibility Study and Option Down-Select). Follow-on phases include: Phase 6.2A (Design Definition and Cost Study), Phase 6.3 (Development Engineering), Phase 6.4 (Production Engineering), Phase 6.5 (First Production) and Phase 6.6 (Full-Scale Production). All phases are conducted in accordance with the Department of Energy (DOE) Procedural Guidelines for the Phase 6.X Process.

B61-12 Life Extension Program

On February 27, 2012, the Nuclear Weapons Council authorized Phase 6.3 (Development Engineering) for the B61-12 LEP. This LEP will address multiple components that are nearing end of life and address military requirements for reliability, service life, field maintenance, safety and use control. NNSA, in coordination with the Air Force, studied a number of design alternatives to address the military's requirements, ranging from component replacement alterations to full-scope nuclear and non-nuclear refurbishments. The joint effort also included a separate study to assess the schedule and costs for each alternative. The selected option includes refurbishment of both nuclear and non-nuclear components to address aging, assure extended service life, and improve the safety, effectiveness, and security of the bomb. With these upgrades and the addition of new Air Force components, the B61-12 LEP will consolidate and replace the B61-3, -4, -7, and -10 bombs. The consolidation will enable a reduction in the number of gravity bombs consistent with the Nuclear Posture Review Report (DoD 2010) objectives. The scope incorporates component reuse where possible and omits higher-risk technologies to reduce costs and schedule risks. The first production unit is planned for FY 2020.

W76-1 Life Extension Program

The W76-1 LEP extends the life of the W76 for an additional 30 years. The first production unit (FPU) was completed in FY 2008. The NNSA provides the reentry body assembly and delivery components to the DoD for integration into the Trident II D5 Strategic Weapon System. It is part of the Submarine Launched Ballistic Missile (SLBM) force.

W78/88-1 Life Extension Program

NNSA does not propose further funding for the W78/88-1 LEP in FY 2016, and any funds remaining from the FY 2014 appropriation will complete the orderly suspension of W78/88-1 LEP activities. In June 2012, the Nuclear Weapons Council (NWC) authorized a Phase 6.2 study for a W78/88-1 LEP interoperable warhead. NNSA, based on revised NWC guidance, has deferred this program to FY 2020 with a new projected FPU in FY 2030.

W88 ALT 370

On October 9, 2012, the NWC authorized Phase 6.3 (Development Engineering) for the W88 ALT 370. This Alteration will address lifetime requirements by modernizing the AF&F system, improving surety, and incorporating a lightning arrestor connector. It will also provide required logistical spares for maintaining the life of the system. The design of the Arming and Fuzing portion of the AF&F is planned to be forward compatible with future Air Force and/or LEPs. The maintenance programs for neutron generator and gas transfer system replacement will be funded under the W88 enduring stockpile system, but actual replacement will be performed concurrently with the Alteration operation. Based on information provided by Los Alamos National Laboratory (LANL) in 2014, the NWC decided to replace the Conventional High Explosives (hereafter referred to as CHE Refresh) on the W88-0. CHE Refresh will leverage ALT 370 tests to maximum extent possible to minimize costs, reduce the logistical impact on the Department of the Navy, and FPU coincident with the ALT 370. The first production unit is planned for FY 2020.

W80-4 Life Extension Program

The W80-4 LEP title represents the July 2014 NWC down-select to the W80 warhead in Phase 6.1 of the Cruise Missile Warhead LEP/Long Range Stand-Off program. This LEP will consider W80 based reuse, refurbishment, and replacement options of nuclear and non-nuclear components to provide a warhead for the Air Force LRSO cruise missile - the replacement for the current, aging Air Launched Cruise Missile. The LEP will be consistent with limits laid out in the 2010 Nuclear Posture Review. The program will integrate the warhead with the replacement missile platform; address warhead component aging concerns, military requirements for reliability, service life, field maintenance, and surety. LLNL and SNL, respectively, are the nuclear and non-nuclear design agencies for this LEP. Key design requirements established for this LEP include using IHE for all primaries, maximizing use of common non-nuclear components, including common approaches for LEP designs (e.g., the B61-12 and W76-1), exploring options for enhanced surety, complying with the 2010 Nuclear Posture Review Report and concurrent engineering with the Air Force on Warhead/Missile interface. The changes under this program in this budget request are submitted to support the DoD requested change of FPU to 2025.

- The following information is submitted in accordance with language set forth in House Report 2354, H.R.t 112-118 that accompanies the Energy and Water Development Appropriations Bill 2012.
    - Full Scope of the Conceptual Design Activities Proposed: Prior to the Phase 6.1 study, in 2012 and 2013, the NNSA collaborated with the Air Force in an Analysis of Alternatives (AoA) to replace the Air-Launched Cruise Missile. The AoA considered warheads from the W84 Ground-Launched Cruise Missile, W80 Air-Launched Cruise Missile, and the B61 gravity bomb. In a meeting on November 3, 2013, the Nuclear Weapons Council agreed to eliminate the B61 from further consideration because the B61 exceeded military characteristics for size and weight, thereby negatively impacting key missile performance characteristics. In August 2014, the Nuclear Weapons Council agreed to remove the W84 warhead from further consideration due to insufficient quantities of existing W84 warheads to meet lifetime stockpile needs. The Phase 6.1 study will therefore focus on developing and evaluating concepts related to the W80 warhead family. In addition to assessing concepts for refurbishment and reuse of the W80, the Phase 6.1 study will assess replacement and begin developing the information needed to respond to the National Defense Authorization Act request for a report from the directors of the NNSA laboratories on the life extension options for the nuclear explosive package. Fiscal Year (FY) 2014 Phase 6.1 activities concentrated on understanding how to assess surety options, and further developing system architecture concepts for warhead subsystems. FY 2015 Phase 6.1 activities will include increasing; further evaluation of surety options; development of warhead subsystem architectures; writing the Phase 6.1 final study report; developing a plan for Phase 6.2 activities, including scope, schedule, and cost; and continuing to refine the draft Military Characteristics and Stockpile-to-Target Sequence.
    - Estimate of the Total Cost of the Concept Study: The Phase 6.1 Study commenced on July 1, 2014, with a joint meeting between DOD and NNSA. The total cost in FY 2014 was $3.0 million and the estimated cost in FY 2015 is $7.4 million for a total of $10.4 million. The total FY 2015 request and budget authorization for the Cruise Missile LEP study was $9.4 million. Approximately $2 million will be used to start Phase 6.2 in the fourth quarter of FY 2015.
    - Related Technology Maturation Activities to be performed in conjunction with the study: The Phase 6.1 study does not include expenditures on technology maturation specifically focused on cruise missile warhead options. The Phase 6.1 study will list possible technologies that could be matured in later phases and applied to the life extension program. In addition, the Engineering and Science Campaigns continually work to develop multi-application technologies to improve safety, security and reliability for future insertion into the stockpile. When a specific technology has progressed to a sufficiently matured readiness level where it can be applied to a single, specific weapon system, responsibility for product realization and funding comes from the identified tail number or life extension program. Likewise, technologies already developed for the B61-12 gravity bomb and W88 sea-launched ballistic missile arming, fuzing and firing (AF&F) assembly will be assessed and considered for insertion as part of this concept study.

FY 2017 - FY 2020 Key Milestones

B61-12 Life Extension Program

- **System Engineering & Integration**: Phase 6.4 production engineering will continue in FY 2017 following the completion of the system-level baseline design review and associated phase gate review. Process prove-in (PPI) activities will continue through FY 2018. Completion of the final design review, independent peer reviews, and system final design release will be completed in FY 2018. Joint qualification activities will continue into FY 2019 to enable release of system qualification and associated aircraft compatibility documents. Phase 6.5 will occur in FY 2019 following the completion of production readiness review and the Pre Pilot Production Gate Review. First production unit will occur in FY 2020.
- **Component Development & Production**: Phase 6.4 production engineering activities will continue in FY 2017 at NNSA production plants to assure all production hardware meets war reserve quality requirements. PPI and qualification activities will continue through FY 2019 for all major components and assemblies, including new firing, arming and safing fuzing components, radar and weapon controller, nuclear explosives package components, system II interface, limited life components, power supplies, thermal batteries, and use control components. All component qualifications will be completed in FY 2019 and all war reserve hardware will be required to be shipped to Pantex in FY 2020 to support the first production unit.
- **System Testing & Qualification**: Testing will continue in FY 2017 through FY 2019 utilizing B61-12 LEP production representative functional hardware produced at NNSA production plants. System qualification testing, including both joint flight tests with the Air Force tail kit assembly (TKA) and ground test against normal and abnormal environments will continue through FY 2019. NNSA and Air Force will conduct aircraft compatibility testing to certify the B61-12 LEP nuclear bomb on required aircraft platforms. Laboratories will continue modeling, simulations and analysis of test data to support system qualification in FY 2019. A system qualification report will be published documenting the qualification of the B61-12 LEP nuclear bomb in preparation for the first production unit in FY 2020. The final design review and acceptance group (DRAAG) reviews will be scheduled for FY 2020.

W76-1 Life Extension Program

- Meet production and delivery schedules for FY 2016.
- Continue efforts for improving the manufacturability of the components and reducing costs.
- Perform Annual Assessment for the W76-1 warheads.

W88 Alteration 370 Program

- **System Engineering & Integration**: Phase 6.4 production engineering activities at the system-level will continue in FY 2017. PPI activities continue in through FY 2018. The final design review, independent peer reviews, and system final design release complete in FY 2018. Phase 6.X begins in FY 2020 following completion of a production readiness review and the Pre Pilot Production Gate Reviews in FY 2019. First production occurs in FY 2020.
- **Component Development & Production**: Phase 6.4 production engineering activities at the major component level continue in FY 2017 at NNSA production plants to assure all production hardware meets war reserve quality requirements. PPI and qualification activities continue through FY 2018 for all major components and assemblies, including new Arming, Fuzing, and Firing system (AF&F) and Lightning Arrestor Connector (LAC) and NEP component development work associated with CHE Refresh. All component qualifications complete in FY 2018 and war reserve hardware begins shipping to Pantex in FY 2019.
- **System Testing & Qualification**: Development flight testing continues in FY 2017 using final development prototype functional hardware. Joint ground and flight testing that includes normal and abnormal environments testing are coordinated and conducted through FY 2018 with the Department of Navy and includes requirements to implement CHE Refresh. NNSA design laboratories continue modeling, simulations and analysis of test data to support system qualification in FY 2018. A system qualification report, documenting the qualification of the W88 ALT 370 Weapon System in preparation for the first production unit, is published in FY 2020. The final Design Review and Acceptance Group (DRAAG) review occurs in FY 2020, followed by release of the final weapon development report in FY 2021.

W80-4 Life Extension Program

- With NWC authorization, Phase 6.2 will commence fourth quarter FY 2015, and is planned to continue into FY 2017. Phase 6.2 will identify and develop design options and compare design and manufacturability tradeoffs and life-cycle advantages and disadvantages. Phase 6.2 will conclude with a written Phase 6.2 report, identifying preferred design options, and out brief to the NWC Standing and Safety Committee (SSC).

- Phase 6.2a is planned to start in FY 2017 to perform a detailed cost study of selected design options, identify production issues, and develop workload and process development plans to accomplish the LEP production. Phase 6.2a will see the formation of system and component product realization teams and the development of technical and programmatic documents in anticipation of developing a program baseline early in Phase 6.3. At the conclusion of Phase 6.2a, the Weapon Design and Cost Report, along with estimated DoD costs, will be presented to the NWC with a final warhead option downselect and a recommendation on proceeding to Phase 6.3.
- Phase 6.3 is planned to start in FY 2018. Phase 6.3 will develop the Baseline Cost Report and Selected Acquisition Report, complete a detailed design demonstrated to be feasible with regard to critical safety, performance, and production considerations, produce the final draft version of the Military Characteristics and Stockpile-to-Target Sequence, and produce a draft addendum to the Final Weapon Development Report for review by the DRAAG.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
B61-12 Life Extension Program $643,000,000	**B61-12 Life Extension Program $643,300,000**	**B61-12 Life Extension Program +$300,000**
• **System Engineering & Integration:** Phase 6.3 development engineering will continue in FY 2015 for the B61 life extension program that includes refurbishment of nuclear and non-nuclear components and consolidation of the B61-3/4/7/10 into the B61-12 LEP. In FY 2015, NNSA will continue system design and integration efforts between the nuclear bomb assembly components and the Air Force tail kit assembly, including production of functional Compatibility Test Units (CTUs) for integration testing with Air Force nuclear certified aircraft. Complete system functionality will also be tested for the first time through two drops of Developmental Flight Test Unites (DFTUs) from Air Force test aircraft. Work will continue on NNSA and DoD trainers including development and delivery of early design trainers and associated handling gear. System test results from FY 2013 through FY 2015 will be evaluated and assessed against requirements in preparation for component and system baseline design reviews scheduled for FY 2015 and FY 2016. • **Component Development & Production**: Phase 6.3 development engineering activities will continue in FY 2015 with focus on updating and base lining the design of functional hardware produced in FY 2013 and FY 2014 for all bomb components, including firing, arming and safing components, radar and weapon controller, nuclear explosives package components, System II interface, limited life components, power supplies, thermal batteries, and use control components. Component baseline design reviews will be	• **System Engineering & Integration:** Phase 6.3 development engineering will conclude in FY 2016 after the completion of the system baseline design review and the completion of the Air Force Preliminary Design Review and Acceptance Group (PDRAAG). Analysis of system test results from FY 2013 through FY 2015 will be utilized for system baseline design reviews scheduled in FY 2016. Following completion of these reviews, the NNSA will authorize Phase 6.4 production engineering for the B61-12 LEP. System design and integration of nuclear bomb components and the Air Force tail kit assembly will continue in 2016 toward validating the final design in FY 2018 including assembly of functional Compatibility Test Units (CTUs) for integration testing on required aircraft platforms. NNSA will continue work on NNSA and DoD trainers including delivery of prototype trainers and associated handling gear. • **Component Development & Production**: Phase 6.4 Production Engineering activities will commence in FY 2016. Production Plants will continue procurement of tooling, testers and materials and begin producing production representative hardware to validate production processes. Process Prove-In (PPI) will begin in 2016 for most bomb components, including firing, arming and safing components, radar and weapon controller, nuclear explosives package components, System II interface, limited life components, power supplies, thermal batteries, and use control components.	• The $300,000 increase represents a $2,000,000 decrease for a minor reduction in design laboratory development efforts and an increase of $2,300,000 for the CNS cost model adjustment. As the B61-12 LEP transitions into Phase 6.4 production engineering in FY 2016, the design laboratories will baseline the bomb system design in early FY 2016 before NNSA approves entry into Phase 6.4 based on comprehensive testing conducted in FY 2013 through FY 2015. The NNSA production plants will increase ramp-up of purchases for long lead commercial off the shelf parts, equipment, tooling, and testers to be utilized in War Reserve production, and will begin component PPI activities.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
completed in preparation for system baseline design review in FY 2016. Production Plants will continue procurement of long lead items, tooling and testers for production activities. Laboratory and production plants will continue to mature manufacturing readiness including development of component tooling and testers to assure readiness for Phase 6.4 activities in FY 2016. • **System Testing & Qualification**: NNSA will continue system development testing and start flight testing on required aircraft platforms in FY 2015. Sandia National Laboratories (SNL) will lead and conduct over 20 system-level joint, ground, aircraft integration, and flight tests in FY 2015. Joint tests will integrate the NNSA bomb assembly and the Air Force tail kit assembly utilizing functional hardware produced in FY 2013 and FY 2014. The system testing will be used to assess and validate functional requirements and mechanical, thermal and electrical environments in preparation of baselining the system design in FY 2016. NNSA will also conduct the first Compatibility Test Unit (CTU) flight test in FY 2015 to assess integration with required aircraft platforms, and the first three joint development flight tests in FY 2015 to assess full system functionality in a normal environment when dropped from Air Force test aircraft. LANL and SNL will continue to utilize modeling and simulation capabilities to support component and system design margin analysis.	• **System Testing & Qualification**: NNSA will continue system testing in FY 2016. Sandia National Laboratories will lead and conduct over 20 system-level joint, ground, and aircraft integration tests in FY 2016. Joint tests will integrate the NNSA bomb assembly and the Air Force tail kit assembly utilizing functional hardware produced in FY 2014 through FY 2015. The system testing will be used to assess and validate functional requirements and mechanical, thermal and electrical environments in preparation of baselining the system design in FY 2016. NNSA will also continue CTU flight tests in FY 2016 to assess integration with required aircraft platforms. LANL and SNL will continue to utilize modeling and simulation capabilities to support component and system design margin analysis.	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
W76-1 Life Extension Program $259,168,000	**W76-1 Life Extension Program $244,019,000**	**W76-1 Life Extension Program -$15,149,000**
• Perform Annual Assessment for the W76-1 LEP. • Continue efforts for improving the manufacturability of the components and reducing costs. • Continue disassembly of W76-0 for the W76-1 LEP feedstock. • Complete Retrofit Evaluation System Tests (REST) of W76-1 LEP production components and war reserve hardware. • Complete production of replacement components destructively tested and rebuild of war reserve after REST and stockpile surveillance through the life of the program. • Continue the purchase of materials in economic lot sizes to reduce costs at KCP. • Establish requirements for process transfers, executed activities to assure continuity of production at Pantex during process transfer, and provided for provision of components; materials; containers; special tooling; and certification of test equipment for the move to new facility at Botts Road. • Complete the activities to re-establish continuous production at KCP Botts facility by the end of FY 2015. These purchases supported production rates contained in the Requirements and Planning Document (RPD) and schedules to meet the current deliverables in agreement with the Department of the Navy (DoN) and in support of submarine deployment requirements. • The program will continue to execute production builds at an approved rate and realign the production of replacement components with the production schedule, to include components for the nuclear explosive package, AF&F assembly, 2X	• Perform Annual Assessment for the W76-1 LEP. • Continue efforts for improving the manufacturability of the components and reducing costs. • Continue disassembly of W76-0 for the W76-1 LEP feedstock. • Complete Retrofit Evaluation System Tests (REST) of W76-1 LEP production components and war reserve hardware. • Complete production of replacement components destructively tested and rebuild of war reserve after REST and stockpile surveillance through the life of the program. • Continue the purchase of materials in economic lot sizes to reduce costs at KCP. • Establish requirements for process transfers, executed activities to assure continuity of production at Pantex during process transfer, and provided for provision of components; materials; containers; special tooling; and certification of test equipment for the move to new facility at Botts Road. • Perform purchases of vendor materials to support production rates contained in the Requirements and Planning Document (RPD) and schedules to meet the current deliverables in agreement with the Department of the Navy (DoN) and in support of submarine deployment requirements. • The program will continue to execute production builds at an approved rate and realign the production of replacement components with the production schedule, to include components for the nuclear explosive package, AF&F assembly, 2X Acorn Gas Transfer System, Neutron Generator, and associated cables, elastomers, valves, pads,	• The $15,149,000 decrease represents a decrease of $6,969,000 for the completion of all W76-1 LEP component production requalification processes at the new KCP National Security Campus by the end of FY 2015 to establish continuous production at the new facility (all other W76-1 LEP component production processes at the other NNSA production facilities are continuing at steady state production rates in accordance with the directive schedules defined in the W76-1 LEP Program Control Document); a decrease of $15,700,000 that represents funding being transferred to the W88 ALT 370 for higher priority activities associated with CHE Refresh; and an increase of $7,520,000 as a result of a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Acorn Gas Transfer System, Neutron Generator, and associated cables, elastomers, valves, pads, cushions, foam supports, telemetries, and miscellaneous parts.	cushions, foam supports, telemetries, and miscellaneous parts.	
W78/W88-1 Life Extension Program $0	**W78/W88-1 Life Extension Program $0**	**W78/W88-1 Life Extension Program $0**
• No program activities in FY 2015, 6.1 will resume in FY 2020.	• No program activities in FY 2016, 6.1 will resume in FY 2020.	• N/A
W88 ALT 370 $165,400,000	**W88 ALT 370 $220,176,000**	**W88 ALT 370 +$54,766,000**
• **System Engineering & Integration:** Phase 6.3 development engineering continues in FY 2015 for the W88 ALT 370 program, that includes a new AF&F Assembly and Lightning Arrestor Connector. FY 2015 systems engineering and integration activities include assessment and integration of component development efforts in preparation to baseline the W88 ALT 370 design in FY 2015. Development and testing of new joint test assemblies to meet flight test objectives with the Navy continues. Development of Type 3 and Type 5 trainers and associated H-gear/T-gear designs continues. Joint system integration activities with the Navy continue including finalization of Interface Control Documents (ICD). • **Component Development & Production:** Development engineering activities continue in FY 2015 for major components and subsystems. Included in this development are the new AF&F assembly, stronglinks, radar, firing subsystem, thermal batteries, impact fuze, and launch accelerometer, lightning arrestor connector, and joint flight test assemblies. Production and delivery of development components and hardware continues to meet component and system level qualification and testing milestones	• **System Engineering & Integration:** Phase 6.4 Production Engineering activities begin in FY 2016 to mature production processes in preparation for qualification and eventual war reserve production. The Navy will convene a preliminary Design Review and Acceptance Group (PDRAAG) in FY 2016 to assess design and qualification against military requirements. Early Type 5 trainers will be produced in FY 2016 to support production readiness at the Pantex Plant. • **Component Development & Production:** Qualification activities continue with additional activities to integrate changes necessary to meet CHE Refresh objectives in FY 2016 for all major components and assemblies, including new Arming, Fuzing & Firing Assembly, stronglinks, radar, firing subsystem, thermal batteries, impact fuze, and launch accelerometer, lightning arrestor connector, and joint flight test assemblies. • **System Testing & Qualification:** Phase 6.4 production engineering activities continues in FY 2016 with additional tests to integrate CHE Refresh NNSA and the Navy will conduct compatibility testing to certify the W88 ALT 370 with the Trident II D5 missile system. NNSA	• The $54,766,000 increase represents two significant aspects to the program as it transitions into FY 2016: • $7,250,000 for ongoing Phase 6.4 activities. In FY 2016 there are minor decreases in engineering development and a ramp up of early Phase 6.4 Pre-production activities culminating in a system-level baseline design review. Production engineering continues in FY 2016 at NNSA production plants to assure all production hardware meets war reserve quality requirement. The NNSA production plants will increase ramp-up of purchases for long lead commercial off the shelf parts, equipment, tooling, and testers to be utilized in War Reserve production. • $47,516,000 directly ties to new scope for CHE Refresh. This includes additional system qualification activities, NEP work, AF&F System Engineering, Joint Test Assembly, and system integration work.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
in FY 2015. The component Product Realization Teams conduct the preponderance of component Baseline Design Reviews (BDRs) in FY 2015 in support of the system BDR planned for early FY 2015. Baseline design development of component tooling and testers continue to support readiness for Phase 6.4 activities in FY 2016. • **System Testing & Qualification:** Development engineering activities continue in FY 2015 with ground and flight joint test assemblies. System qualification testing, including both joint flight tests with the Navy and ground test against normal and abnormal environments are conducted in FY 2015 through FY 2019. Ground testing continues in FY 2015 to assess mechanical and thermal environments. Joint testing is required with the Navy to demonstrate compatibility with the Trident D5 missile system. • NNSA in coordination with the DoD (Navy) and the NWC are pursuing options to continue the CHE Refresh in FY 2015 to keep it aligned with the W88 ALT 370 FPU.	design laboratories will continue modeling and simulations and analysis of test.	
W80-4 Life Extension Program $9,418,000 • ICD development will continue. • FY 2015 Phase 6.1 activities will include, continued development of warhead subsystem architectures, writing the Phase 6.1 final study report, developing a comprehensive plan for Phase 6.2 activities including scope, schedule, and cost, and continuing to refine the draft Military Characteristics (MC's) and Stockpile to Target Sequence (STS). • Phase 6.1 activities are planned in accordance with the requested budget of $9,418,000. Changes to	**W80-4 Life Extension Program $195,037,000** • ICD development will continue. • Military Characteristics and Stockpile-to-Target Sequence continues to be refined. • Funding profile supports a FY 2025 FPU that enables the Phase 6.2 to be accelerated to meet the new FPU date for the program (two year pull up). • Program continues in Phase 6.2 to identify and develop design options and compare design and manufacturability tradeoffs and life-cycle advantages and disadvantages with respect to	**W80-4 Life Extension Program +$185,619,000** • The $185,619,000 increase represents execution of Phase 6.2 activities for the duration of FY 2016. This increase supports a program schedule change to FPU from FY 2027 to FY 2025. This enables the Phase 6.2 to be accelerated to meet the new FPU date for the program (two year pull up). • $145,000,000 of this increase is planned for technology maturation and manufacturing readiness specific to the W80-4 including surety technologies, power supply technologies, neutron generator

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
the actual allocation will determine the depth of surveillance and surety analysis and architecture development that will be executed. • Phase 6.2 will commence fourth quarter FY 2015 with limited technology maturation. • Phase 6.2a will commence in FY 2017 with full technology maturation as a parallel activity. Phase 6.3 will start in FY 2018.	reuse, refurbishment, and replacement; surety; military requirements for reliability, service life, and field maintenance; and warhead/missile integration. • Program will begin to fund W80-4 specific technology maturation in areas not supported by other NNSA programs. Efforts will focus on the development of technologies and components that support design options in accordance with draft military characteristics. Technology maturation and component development will be completed in an accelerated mode to meet the W80-4 FPU. • Program will begin development of program control processes and supply chain management.	development, modeling activities, and communication architectures to interface with the DoD delivery platform. Technology maturation and component development will be completed in an accelerated mode to meet the W80-4 FPU. • $34,619,000 of this increase represents Phase 6.2 study activities including option development and feasibility studies, continued interface control development, and requirements analysis. • $4,000,000 of this increase represents a ramp up for program control processes and staffing activities. • $2,000,000 of this increase represents activities related to supply chain management.

Directed Stockpile Work
Stockpile Systems

Description

Stockpile Systems directly executes sustainment activities for the total (active and inactive) stockpile for the B61, W76, W78, W80, B83, W87, and W88 weapons. Safety, security and effectiveness assessments are performed to determine whether an underground nuclear test is required by 50 United States Code 2525 that mandates an Annual Stockpile Assessment and Memorandum to the President. Sustainment activities for each weapon system are identified by four major subprograms that support the enduring stockpile system, as well as LEPs and Major Program Alterations:

Current U.S. nuclear weapons and associated delivery systems

Warheads—Strategic Ballistic Missile Platforms					
Type [a]	***Description***	***Carrier***	***Laboratories***	***Mission***	***Military***
W78	Reentry vehicle warhead	Minuteman III intercontinental ballistic missile	LANL/SNL	Surface to surface	Air Force
W87	Reentry vehicle warhead	Minuteman III intercontinental ballistic missile	LLNL/SNL	Surface to surface	Air Force
W76-0/1	Reentry body warhead	D5 submarine-launched ballistic missile Trident submarine	LANL/SNL	Underwater to surface	Navy
W88	Reentry body warhead	D5 submarine-launched ballistic missile Trident submarine	LANL/SNL	Underwater to surface	Navy
Bombs—Aircraft Platforms					
Type [a]	***Description***	***Carrier***	***Laboratories***	***Mission***	***Military***
B61-3/4/10	Non-strategic bomb	F-15, F-16, certified NATO aircraft	LANL/SNL	Air to surface	Air Force/ Select NATO forces
B61-7	Strategic bomb	B-52 and B-2 bombers	LANL/SNL	Air to surface	Air Force
B61-11	Strategic bomb	B-2 bomber	LANL/SNL	Air to surface	Air Force
B83-1	Strategic bomb	B-52 and B-2 bombers	LLNL/SNL	Air to surface	Air Force
Warheads—Cruise Missile Platforms					
Type [a]	***Description***	***Carrier***	***Laboratories***	***Mission***	***Military***
W80-1	Air-launched cruise missile strategic weapons	B-52 bomber	LLNL/SNL	Air to surface	Air Force

LANL = Los Alamos National Laboratory
LLNL = Lawrence Livermore National Laboratory
NATO = North Atlantic Treaty Organization
SNL = Sandia National Laboratories
[a]The suffix associated with each warhead or bomb type (*e.g.*, "-0/1" for the W76) represents the modification associated with the respective weapon.

Stockpile Systems Major Activity Levels:

(1) Weapon Maintenance: includes production of Limited Life Components (LLCs) that include Gas Transfer Systems (GTS) and Neutron Generators (NGs) as required in accordance with National Requirements Documents and/or Directive Schedules; day-to-day stockpile maintenance/repair activities; production and delivery of components for each weapon type; refurbishment and replacement of aging components to maintain stockpile life; and rebuilds.

(2) Weapon Surveillance: includes new material laboratory tests, new material flight tests, retrofit evaluation system laboratory and flight tests, stockpile laboratory tests, stockpile flight tests, quality evaluations, special testing, and surveillance of weapon systems to support assessment of the safety, security, and effectiveness of the nuclear weapons stockpile and also contribute to the Annual Assessment and memorandum to the President.

(3) Weapon Assessment and Support: includes activities associated with management of the fielded weapon system. Provide systems and component engineering support, support the planning, resolution, and documentation of SFIs to include assessment of root cause, extent of conditions, and impact t to system effectiveness or safety. Also includes activities associated with planning, developing, and updating the technical basis for the materials, components, and weapons and performing the weapon assessments. Finally, activities associated with preparation, writing, and

coordination of Annual Assessment Reports (AARs) and Weapon Reliability Report and activities needed to assess/resolve system-specific weapon response issues and to provide support to the Nuclear Explosive Safety (NES) and the Nuclear Weapon Safety Study Groups (NWSSG) as required.

(4) Development Studies/Capability Improvements: includes activities associated with improved surveillance, technical basis improvements, technology maturation for insertion or replacement, and system/surety studies.

Stockpile Systems Description

B61 Stockpile Systems

The B61 aircraft delivered gravity bombs are the oldest weapons in the enduring stockpile. The B61 family includes five modifications with two distinct categories. The strategic category includes the B61 Modifications -7 and -11, with Modification-11 being the only active earth penetrating weapon. The non-strategic category includes the B61 Modifications -3, -4, and -10 supporting our extended nuclear commitment.

W76 Stockpile Systems

The W76-0 is the warhead integrated into the Trident II D5 Strategic Weapon System. It is part of the Submarine Launched Ballistic Missile (SLBM) force. The W76-0/Mk4 is completed by NNSA as a Reentry Body Assembly and delivered to the DoD.

W78 Stockpile Systems

The W78 is a warhead integrated into the Air Force's Mk12A re-entry vehicle deployed on the Minuteman III Intercontinental Ballistic Missile (ICBM). It is part of the ICBM force.

W80 Stockpile Systems

The W80 is a warhead used in the Air Launched Cruise Missile deployed by the Air Force.

B83 Stockpile Systems

The B83 is an aircraft delivered, strategic gravity bomb deployed by the Air Force.

W87 Stockpile Systems

The W87 is a warhead integrated into the Air Force's Mk21 re-entry vehicle deployed on the Minuteman III ICBM. It is part of the ICBM force.

W88 Stockpile Systems

The W88 is integrated into the Trident II D5 Strategic Weapon System. It is part of the Submarine Launched Ballistic Missile (SLBM) force. The W88/Mk5 is completed by NNSA as Reentry Body Assembly and delivered to the DoD.

FY 2017-FY 2020 Key Milestones

B61 Stockpile Systems

- **Weapon Maintenance:** Continue to produce LLCs and achieve first production on electronic neutron generator qualified for B61-11 in FY 2019.
- **Weapon Surveillance:** Continue surveillance activities at a reduced level to include but not limited to: disassembly and inspections, system-level laboratory tests, joint flight testing, component and material evaluations, and assessment.
- **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, which include: laboratory testing and analysis, and significant finding investigations as required.
- **Development Studies/Capability Improvements:** Continue feasibility studies as required and development of the electronic neutron generator.

W76 Stockpile Systems

- **Weapon Maintenance:** Conduct maintenance activities in accordance with directive documents (PCD).
- **Weapon Surveillance:** Conduct surveillance activities for the W76-0 and W76-1 in accordance with directive documents. Continue to conduct W76-0 and W76-1 stockpile surveillance to include: disassembly and inspection (D&I),

system-level laboratory and joint flight testing, component and material evaluations (CME), and platform compatibility and testing activities.

- **Weapon Assessment and Support:** Continue to conduct weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports to include: laboratory/site testing and analysis, trainer refurbishments, and SFIs.
- **Development Studies/Capability Improvements:** Provide laboratory and management expertise to POG and DoD Safety Studies. W76 development studies and capabilities will be focused toward the on-going LEP. Conduct activities for surety enhancements.

W78 Stockpile Systems

- **Weapon Maintenance:** Conduct maintenance activities in accordance with directive documents (PCD) and execute repair, and replacement of aging components as required.
- **Weapon Surveillance:** Continue to conduct surveillance activities in accordance with directive documents, to include: disassembly and inspections, system-level laboratory tests, joint flight testing, component and material evaluations, and assessment.
- **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports to include: laboratory testing and analysis, and Significant Finding Investigations as required.
- **Development Studies/Capability Improvements:** Conduct feasibility studies as required and in conjunction with the DoD as necessary. Begin surety enhancement development activities in FY 2020.

W80 Stockpile Systems

- **Weapon Maintenance:** Continue production of LLCs and ALT 369 that includes neutron generator replacement.
- **Weapon Surveillance:** Continue surveillance activities to include but not limited to: disassembly and inspection (D&I), system-level laboratory and joint flight testing, joint flight testing, component and material evaluations, assessment, and platform compatibility and testing activities.
- **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports that include: laboratory testing and analysis, and significant finding investigations as required.
- **Development Studies/Capability Improvements:** Conduct feasibility studies as required and in conjunction with the DoD as necessary.

B83 Stockpile Systems

- **Weapon Maintenance:** Continue to support reduced LLCE operations for replacement of aging components as required.
  Weapon Surveillance: Continue surveillance activities at a reduced level to include but not limited to: disassembly and inspections, system-level laboratory tests, joint flight testing, component and material evaluations, and assessment.
- **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, which include: laboratory testing and analysis, and significant finding investigations as required.
- **Development Studies/Capability Improvements:** No activities planned.

W87 Stockpile Systems

- **Weapon Maintenance:** Continue full scale production of Small Ferroelectric Neutron Generators (NGs) and exchange of NGs at Pantex Plant. Continue activities for replacement of Gas Transfer System (ALT 360) with an FPU in FY 2019. Continue firing set qualification and first production unit activities.
- **Weapon Surveillance:** Continue surveillance activities in accordance with directive documents, to include: disassembly and inspection, system-level laboratory and joint flight testing, component and material evaluations. In addition, Retrofit Evaluation System Tests for the W87 Limited Life Component Exchange and Firing Set Rebuilds will continue in FY 2016.
- **Weapon Assessment and Support:** Continue weapon assessment necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and analysis, Project Officer Group and DoD safety studies, and Significant Finding Investigations.

- **Development Studies/Capability Improvements:** Continue product realization activities for W87 ALT 360. Continue feasibility studies as required in conjunction with the DoD.

W88 Stockpile Systems

- **Weapon Maintenance:** Achieve FPU build of new NG and re-manufacture of the GTS. Continue to execute repair, maintenance, and replacement of aging weapon components. Full scale production of NG and GTS will begin in FY 2019.
- **Weapon Surveillance:** Continue surveillance activities to include: disassembly and inspection, system-level laboratory and joint flight testing, component material evaluation, and platform compatibility and testing activities.
- **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and analysis, trainer refurbishments, and Significant Finding Investigations.
- **Development Studies/Capability Improvements:** Continue critical development/integration and start system level qualification activities to replace legacy W88 System NG and GTS. Conduct appropriate feasibility studies in conjunction with the Department of Defense; provide laboratory and management expertise to the Project Officer Group and Department of Defense Safety Studies. Conduct activities for surety enhancements, to include implementation of the ISA technologies.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
B61 Stockpile Systems $109,615,000	**B61 Stockpile Systems $52,247,000**	**B61 Stockpile Systems -$57,368,000**
• **Weapon Maintenance:** Continue development activities toward joint qualification of the Electronic NG (ELNG) for the B61. Continue to produce LLCs. • **Weapon Surveillance:** Continue surveillance activities, including, but not limited to: disassembly and inspections, system-level laboratory tests, joint flight tests, component and material evaluations, and assessment. Continue development activities on Joint Test Assembly Modernization program toward a first production unit (FPU) in FY 2015. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory testing and analysis, and conduct significant finding investigations as required. • **Development Studies/Capability Improvements:** Transfer of responsibility for the Electronic NG development from the B83. Continue feasibility studies as required and in conjunction with the DoD as necessary.	• **Weapon Maintenance:** Continue to produce LLCs. Continue ELNG development and qualification activities to achieve a first production unit for the B61-11 in FY 2019. • **Weapon Surveillance:** Continue surveillance activities, including, but not limited to: disassembly and inspections, system-level laboratory tests, joint flight tests, component and material evaluations, and assessment. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, which include: laboratory testing and analysis, and significant finding investigations as required. • **Development Studies/Capability Improvements:** Continue design activities for the Electronic NG. Continue feasibility studies as required and in conjunction with the DoD as necessary.	• The $57,368,000 decrease represents a realignment of the budget for the ELNG; successful achievement of first production units for the Joint Test Assembly Modernization program in FY 2015; and an update to stockpile requirements to transfer funding to support the W88 CHE Refresh activities. This also includes a decrease of $908,000 due to the transfer of funding to Production Support for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding.
W76 Stockpile Systems $45,728,000	**W76 Stockpile System $50,921,000**	**W76 Stockpile Systems +$5,193,000**
• **Weapon Maintenance:** Continue to produce LLCs. • **Weapon Surveillance:** Conduct W76-0 and W76-1 surveillance to include: disassembly and inspection (D&I), system-level laboratory and joint flight testing, component and material evaluations (CME), and platform compatibility and testing activities.	• **Weapon Maintenance:** Continue to produce LLCs, and increase production plant support for GTS. • **Weapon Surveillance:** Conduct W76-0 and W76-1 surveillance to include: disassembly and inspection (D&I), system-level laboratory and joint flight testing, increase in component testing at Y-12 and LANL, component and material evaluations	• The $ 5,193,000 increase represents a $14,095,000 decrease due to the transfer of funding to Production Support for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding. This is offset by a $19,288,000 increase for the ramp-up of the stockpile surveillance

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
• **Weapon Assessment and Support:** Continue to conduct weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports to include: laboratory/site testing and analysis, trainer refurbishments, and SFIs. • **Development Studies/Capability Improvements:** Provide laboratory and management expertise to POG and DoD Safety Studies.	(CME), and platform compatibility and testing activities. • **Weapon Assessment and Support:** Continue to conduct weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports to include: laboratory/site testing and analysis, trainer refurbishments, and SFIs. • **Development Studies/Capability Improvements:** Provide laboratory and management expertise to POG and DoD Safety Studies.	program for the W76-1 at the Production Plants and National Laboratories for stockpile returned units required for laboratory and flight testing program. This includes the disassembly and inspection, flight test unit assembly, laboratory system testing, components testing, and rebuild of stockpile samples for return to the stockpile.
W78 Stockpile Systems $62,703,000	**W78 Stockpile Systems $64,092,000**	**W78 Stockpile Systems +$1,389,000**
• **Weapon Maintenance:** Begin activities to obtain authorization to conduct weapons repair, implement new tooling, and continue maintenance and replacement of aging components as required. • **Weapon Surveillance:** Continue surveillance activities to include but not limited to: disassembly and inspections, system-level laboratory tests, joint flight testing, component and material evaluations, and assessment. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory testing and analysis, and Significant Finding Investigations as required. • **Development Studies/Capability Improvements:** Conduct feasibility studies as required and in conjunction with the DOD as necessary.	• **Weapon Maintenance:** Achieve weapon repair FPU, continue maintenance activities and replacement of aging components as required. • **Weapon Surveillance:** Continue surveillance activities include but not limited to: disassembly and inspections, system-level laboratory tests, joint flight testing, component and material evaluations, and assessment. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory testing and analysis, and Significant Finding Investigations as required. • **Development Studies/Capability Improvements:** Conduct feasibility studies as required and in conjunction with the DOD as necessary.	• The $1,389,000 increase represents funding of $6,567,000 for the W78 NG Hedge requirements, offset by a decrease of $3,816,000 for the completion of weapon repair activities. This also includes a decrease of $1,362,000 due to the transfer of funding to Production Support for transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
W80 Stockpile Systems $70,610,000 • **Weapon Maintenance:** Continue to produce LLCs. Continue W80 Neutron Generator subassembly development and qualification activities in support of First Production Unit delayed beyond FY16, previously scheduled for FY2015. Complete W80 ALT 369 qualification activities for new replacement components at Kansas City Plant. Continue ALT 369 and Disassembly & Inspection (D&I) Authorization Basis (AB) activities in support of a W80-1 ALT 369 FPU. • **Weapon Surveillance:** Continue surveillance activities to include but not limited to: disassembly and inspection (D&I), system-level laboratory and joint flight testing, joint flight testing, component and material evaluations, assessment, and platform compatibility and testing activities. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, which include: laboratory testing and analysis, and significant finding investigations as required. • **Development Studies/Capability Improvements:** Continue feasibility studies as required in conjunction with the DoD, as necessary.	**W80 Stockpile Systems $68,005,000** • **Weapon Maintenance:** Continue to produce LLCs. Continue W80 Neutron Generator qualification activities in support of FPU. Continue ALT 369 and Disassembly & Inspection (D&I) Authorization Basis (AB) activities in support of a W80-1 ALT 369 FPU. • **Weapon Surveillance:** Continue surveillance activities to include but not limited to: disassembly and inspection (D&I), system-level laboratory and joint flight testing, joint flight testing, component and material evaluations, assessment, and platform compatibility and testing activities. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, which include: laboratory testing and analysis, and significant finding investigations as required. • **Development Studies/Capability Improvements:** Continue feasibility studies as required in conjunction with the DoD, as necessary.	**W80 Stockpile Systems -$2,605,000** • The $2,605,000 decrease represents a $16,433,000 decrease due to the transfer of funding to Production Support for transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding. This is offset by an increase of $13,828,000 which represents delayed qualification activities required for the W80 NGs.
B83 Stockpile Systems $63,136,000 • **Weapon Maintenance:** Continue to support LLCE operations for replacement of aging components as required • **Weapon Surveillance:** Continue surveillance activities, including, but not limited to: disassembly and inspections, system-level laboratory tests, joint flight tests, component and	**B83 Stockpile Systems $42,177,000** • **Weapon Maintenance:** Continue to support LLCE operations for replacement of aging components as required. • **Weapon Surveillance:** Continue surveillance activities, including, but not limited to: disassembly and inspections, system-level laboratory tests, joint flight tests, component and	**B83 Stockpile Systems -$20,959,000** • The $20,959,000 decrease represents the update to B83 stockpile requirements to transfer funds to the W88 CHE Refresh activities.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
material evaluations, and assessment. Continue qualification activities for Weapons Evaluation Test Laboratory (WETL) Tester Upgrade program to achieve a Qualification Engineering Release (QER) for the B83 in FY 2015. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory testing and analysis, and significant finding investigations as required. • **Development Studies/Capability Improvements:** Continue feasibility studies as required and in conjunction with the DoD as necessary. Continue to participate in the design, development and qualification activities for the ELNG (Alt 753), if required.	material evaluations, and assessment. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory testing and analysis, and significant finding investigations as required. • **Development Studies/Capability Improvements:** No activities planned.	
W87 Stockpile Systems $91,255,000	**W87 Stockpile Systems $89,299,000**	**W87 Stockpile Systems -$1,956,000**
• **Weapon Maintenance:** Continue full scale production of Small Ferroelectric NGs. Complete final reclamation activities for existing Gas Transfer System in FY 2015. Continue firing set qualification and first production unit activities. • **Weapon Surveillance:** Continue surveillance activities to include: disassembly and inspection, system-level laboratory and joint flight testing, component and material evaluations. In addition, Retrofit Evaluation System Tests for the W87 Limited Life Component Exchange and Firing Set Rebuilds will continue in FY 2015. • **Weapon Assessment and Support:** Continue weapon assessment necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and analysis, Project Officer Group and Department	• **Weapon Maintenance:** Continue Neutron Generator production, firing set qualification and first production unit activities. Continue to produce LLCs; and execute repair, maintenance, and replacement of aging weapon components. • **Weapon Surveillance:** Continue surveillance activities include: disassembly and inspection, system-level laboratory and joint flight testing, component and material evaluations, and platform compatibility and testing activities. In addition, Retrofit Evaluation System Tests for the W87 Limited Life Component Exchange and Firing Set Rebuilds will continue in FY 2016. • **Weapon Assessment and Support:** Continue weapon assessment necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and	• The $1,956,000 decrease represents a $16,146,000 decrease due to the transfer of funding to Production Support for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding. This is offset by an increase of $14,190,000 due to NG production requirements and an increase in execution of repair, maintenance, and replacement of aging weapon components.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
of Defense safety studies, and Significant Finding Investigations. • **Development Studies/Capability Improvement**s: Continue product realization activities for W87 Alt 360. Continue feasibility studies as required in conjunction with the Department of Defense.	analysis, Project Officer Group and Department of Defense safety studies, and Significant Finding Investigations. • **Development Studies/Capability Improvement**s: Continue product realization activities for W87 Alt 360. Continue feasibility studies as required in conjunction with the Department of Defense.	
W88 Stockpile Systems $88,060,000	**W88 Stockpile Systems $115,685,000**	**W88 Stockpile Systems +$27,625,000**
• **Weapon Maintenance:** Continue to execute repair, maintenance, and replacement of aging weapon components. Development activities to support achieving First Production Unit of a new NG in FY 2019. • **Weapon Surveillance:** Continue surveillance activities to include: Disassembly and Inspection, system-level laboratory and joint flight testing, CME, and platform compatibility and testing activities. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and analysis, trainer refurbishments, and Significant Finding Investigations. • **Development Studies/Capability Improvements:** Continue critical minimal NG Timer/Driver Development/Integration and start System level NG qualification activities to replace legacy W88 System NG. Conduct feasibility studies in conjunction with the DoD; provide laboratory and management expertise to the Project Officer Group and DoD Safety Studies.	• **Weapon Maintenance:** Continue to execute repair, maintenance, and replacement of aging weapon components. Continue development activities to achieve Full scale NG production in FY 2019, Neutron Generator Process Prove-In (PPI), and design and qualification activities for the next generation Gas Transfer System (GTS) supporting LLCE beginning in FY 2020. • **Weapon Surveillance:** Continue surveillance activities to include: Disassembly and Inspection, system-level laboratory and joint flight testing, CME, and platform compatibility and testing activities. • **Weapon Assessment and Support:** Continue weapon assessment activities necessary to complete Weapon Reliability and Annual Assessment Reports, to include: laboratory/site testing and analysis, trainer refurbishments, and Significant Finding Investigations. • **Development Studies/Capability Improvements:** Continue critical Development/Integration and start System level qualification activities for surety enhancements, including ISA implementation, and replace legacy W88 System NG and GTS. Conduct appropriate studies in conjunction with the DoD; provide laboratory and management expertise to the POG and DoD Safety Studies.	• The $27,625,000 increase overall represents a $31,000,000 increase for the realignment of ISA (Integrated Surety Architectures) system-specific surety enhancement scope to the W88 Stockpile System. This is offset by a $1,875,000 decrease of development activities for NG production in FY 2019 and a $1,500,000 decrease due to the transfer of funding to Production Support for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding.

Directed Stockpile Work
Weapons Dismantlement and Disposition

Description

Weapons Dismantlement and Disposition (WDD) is a critical element of NNSA's integrated effort to transform the enterprise and the stockpile. Specific activities include weapons disassembly, characterization of components to identify both hazards and classification issues, disposition of retired warhead system components, and surveillance of selected components from retired warheads. Other supporting activities specific to retired warheads include: conducting hazard assessments; issuing safety analysis reports; conducting laboratory and production plant safety studies; procuring shipping and storage equipment; and declassification and sanitization of component parts. WDD relies on several enabling programs to complete its mission, such as Stockpile Services Production Support for shipping, receiving, and equipment maintenance, and Readiness in Technical Base and Facilities (RTBF) for infrastructure sustainment and containers, and the Office of Secure Transportation for movement of weapons and weapons components.

FY 2017-FY 2020 Key Milestones

Key Milestones

- Continue annual activities as stated in the annual Dismantlement Program Plan.
- WDD will continually refine its dismantlement schedule for weapons retired prior to FY 2009.
- WDD will provide material and hardware for the life extension programs.
- Significantly reduce or eliminate legacy inventories at each site by the end of FY 2019
- Y-12 will provide material for external customers (e.g. Naval Reactor program).

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Weapons Dismantlement and Disposition (WDD) $50,000,000	**Weapons Dismantlement and Disposition (WDD) $48,049,000**	**Weapons Dismantlement and Disposition (WDD) -$1,951,000**
• Pursue a balanced approach to dismantling warheads and Canned Sub-Assemblies (CSAs) with the disposition of excess weapon components throughout the nuclear security enterprise. • Pantex and Y-12 will continue to maintain through-put via efficiencies and the flexibility to use multi-shift operations when possible. • Continue planning efforts to receive additional W76-0s. • Continue to provide parts for the life extension programs and external customers. • Increase in FY 2015 Omnibus allows Y-12 to make investments in equipment and glove box lines used in CSA dismantlement. • Increase in FY 2015 Omnibus allows Pantex to increase legacy component disposition and weapons dismantlement over the FYNSP.	• Pursue a balanced approach to dismantling warheads and CSAs and increase scope. • Y-12 will dismantle CSAs as feedstock for internal and external customers (e.g. Naval Reactors). • Pantex will dismantle weapons such that material and component requirements are met (e.g., W80-1 ALT 369 and W76-1). • Y-12 will receive CSAs to sustain the Pantex dismantlement line. • KCP and Savannah River will continue annual disposition activities. • The Lawrence Livermore, Los Alamos, and Sandia National Laboratories will provide technical expertise for systems in dismantlement. • Sites will disposition legacy components. • Continue planning efforts to receive additional W76-0s. • The Lawrence Livermore, Los Alamos, and Sandia National Laboratories will refine safety test plans for system in retirement.	• The $1,951,000 decrease is offset by anticipated FY 2015 carryover. NNSA will still meet the FY 2022 goal of eliminating weapons retired prior to 2009. This includes nuclear weapon and CSA dismantlement scope. The decrease will not impact legacy weapons parts disposition and safety testing for systems in retirement.

Directed Stockpile Work
Stockpile Services

Description
Stockpile Services provide the logistical, mechanical and support foundation for all DSW operations that are not unique to an individual weapon system. This support for all weapon systems and continued sustainment for all DSW operations includes: Production Support and R&D Support, essential for plant and laboratory critical skills, material, quality controls, and surveillance and evaluation activities for the nuclear stockpile; R&D Certification and Safety (R&D C&S),, essential early technology maturation activities for replacement of components across multiple weapon systems due to performance issues, aging, or needed surety enhancements; and Management, Technology, and Production, providing quality engineering and plant management, technology, maintenance and/or replacement of weapons related equipment, and production services. The Plutonium Sustainment and Tritium Readiness activities have moved to the Nuclear Material Commodities program.

Production Support (PS)
Production Support is the backbone for the manufacturing capability of the stockpile and includes those activities that provide the capability and capacity to sustain the nuclear security enterprise's production mission. The production mission is defined as weapon assembly, weapon disassembly, component production, and weapon safety and reliability testing. Production Support funding not only sustains current DSW capabilities, but enables the modernization of the production capabilities to improve efficiency and to prepare manufacturing operations to meet future requirements. To gain better cost efficiency within the Neutron Generator Enterprise, a newly implemented funding model calls for Production Support funding (with a corresponding work scope transfer) to provide the base capability for development and production of neutron tubes and generators for all weapon systems while the weapon systems maintenance funding pays for production of the neutron generators to be installed in the individual systems. This funding model will achieve improved mission performance for the nuclear security enterprise. As indicated previously, Production Support requires close coordination with the Component Manufacturing Development (CMD) activity under the Advanced Manufacturing Development (AMD) program, which is charged with development and initial deployment of new manufacturing and production capabilities.

The Production Support mission scope includes:

(1) Engineering Operations – Internal plant-wide activities that establish product process flows and improvements, develop and maintain operating procedures, determine critical design parameter and manufacturing process capabilities, establish process controls, metrics and quality indices, and develop process safety controls/assessments;

(2) Manufacturing Operations – Activities that manage and provide oversight to manufacturing departments and includes all internal non-weapon-type specific manufacturing operations and processes, material controls, supervision, planning and scheduling, inventory control, internal production-related transportation and internal production related safety activities. It also includes classified manufacturing operations that cannot be associated with a particular warhead;

(3) Quality, Supervision, and Control – Includes activities dealing with quality control of operating expenses, supervision of general in-line inspection and radiography, procedures development and execution, process control certification for War Reserve (WR) products, measurement standards and calibration techniques, calibration of equipment, tooling, gages and testers, and QA-related equipment/process for certification;

(4) Tool, Gage, and Equipment Services – Activities that include preparation of specifications and designs for non-weapon-type specific tooling (tools, gages, jigs and fixtures) and test equipment, as well as, design and development of tester software (including tester control and product assurance). This category also includes work related to verification/qualification of hardware and software, and procurement processes and maintenance (corrective and preventative) that directly support production-related equipment/process components;

(5) Purchasing, Shipping, and Materials Management – Planning, engineering, supplier management and logistics activities associated with the materials supply chain; and

(6) Electronic Product Flow – Activities that include internal plant-wide purchase, design, development, installation, configuration, testing, training and maintenance of computer systems (hardware and software) directly linked to the performance of site-specific production functions, but are separate and distinct from general-use administrative/office automated systems. Supported systems are in both unclassified and classified environments that enable manufacturing and quality assurance functions. In these environments, information technology elements are directly linked to plant-wide production.

Research and Development (R&D) Support

The R&D Support Program provides the administrative and organizational infrastructure overseeing management activities supporting stockpile studies and programmatic work for multiple systems. Direct support to activities include multiple-system flight tests, archiving of weapons data necessary to validate and verify computational and predictive methods without the use of underground tests, updating R&D and engineering tools to remain current with evolving technology, and securing databases for Joint Integrated Lifecycle Surety (JILS) activities. These endeavors support multiple systems in the existing stockpile and reduce multi-faceted risks that can affect operations and procedures for these systems.

The R&D Support mission scope includes:

(1) R&D Infrastructure Support –Activities include maintaining and upgrading computer systems; and providing R&D personnel with technical skills and knowledge critical to R&D work scope.

(2) Program Management and Integration for R&D Activities – Includes maintaining financial databases; milestone tracking; risk analyses; and R&D support for the Project Officers Group (POG) and Nuclear Weapons Safety Study Group; Program Management assignments of R&D laboratory detailees to federal organizations; and activities associated with managing and executing R&D support service contracts.

(3) Laboratory Research and Development Support to the Production Agencies – Covers laboratory work required to support the production agencies' R&D endeavors.

(4) Quality Control for Research and Development - Ensures that quality control procedures and methods are implemented in R&D activities.

(5) Joint Integrated Lifecycle Surety (JILS) – The JILS operational analysis capability evaluates potential surety improvements to the nuclear security enterprise. This is accomplished by assuming the existence of a proposed improvement in either weapon use control capability or weapon physical security and reassessing the security risks associated with selected venues. The updated risk assessments are then compared to the baseline assessment. JILS maintenance consists of database administration of the data stored by the tool's data tables and the upkeep of the hardware and software required to maintain normal operations of the tool.

Research and Development Certification and Safety (RDCS)

RDCS provides the fundamental engineering and applied R&D infrastructure critical for safe, responsible, and efficient stockpile stewardship. In carrying out these responsibilities, RDCS supports the core competencies, personnel, and technologies essential for maintaining reliable and operable stewardship capabilities. Additionally, RDCS addresses and resolves current and emerging stockpile issues. Conducted primarily by the national laboratories and supported by the production sites, the RDCS scope of responsibilities includes (1) Weapon Component Development (WCD), (2) Nuclear Safety Research and Development (NSRD), (3) Integrated Surety Architectures (ISA), (3) Applied R&D Studies, (4) Base Hydrodynamic Experiments, (5) Dynamic Plutonium Experiments, and (6) oversight of DOE and DoD collaborations.

The R&D C&S mission scope includes:

(1) Weapon Component Development (WCD) – Activities are associated with the development, engineering, and integration of technologies that ensure the successful (authorized) use, safety, and handling of each system present in the enduring stockpile. In these efforts, WCD oversees the early-stage development of limited-life components (LLCs) designed to replace sunset technologies; the latter can be defined as components facing performance, aging, and security issues that can have negative impacts on the performance and safety of a weapon. Failure to support these

activities will increase risk, cost, and uncertainty in the operations, maintenance, and safety of current stockpile systems. Moreover, additional risk is introduced as inadequate support will result in moderate-to-permanent loss of expertise and knowledge necessary to execute these activities. Weapon component technologies supported by R&D C&S include:

- Gas Transfer Systems: Activities associated with enhancing the design and capabilities of limited life components to significantly offset weapon aging and uncertainty issues.

- Detonators: Activities required for continual development and improvements associated with detonator technologies to offset aging effects and sunset technologies.

- Neutron Generators (NGs): Activities required for continual development and improvements associated with NG technologies to offset aging effects (e.g., components and materials), and development and qualification of improved rad hard Ferro electric and electronic neutron generator designs.

- Arming, Fuzing and Firing: Required R&D activities needed to modernize arming, fuzing, and firing subsystems to incorporate contemporary electronics and control systems and additional functions.

- Nuclear Explosives Package and Related Components: R&D activities in support of technologies required for next generation components and materials required to ensure safety, security, reliability, and performance of the aging nuclear explosive packages of the enduring stockpile.

- System Engineering and Integration: Activities required to ensure integration of system concepts and revised architecture engineering for refurbished weapons.

- Surety Systems: Activities associated with development and upgrades of fielded safety and use control systems including development of system level context for future surety systems to ensure contemporary and evolving threats and safety issues are properly addressed over the lifetime of the enduring stockpile.

(2) Nuclear Safety Research and Development (NSRD) – NSRD includes activities associated with nuclear safety R&D, leading to development of safety technologies with strategic partners; technology applications for increased surety of materials; and activities, studies and experiments in support of safe nuclear explosive operations.

(3) Integrated Surety Architectures (ISA) – ISA includes activities associated with exploration, and implementation as appropriate, of weapon system concepts and the associated enabling technologies that can effectively supplement physical security. The immediate objective involves mitigating existing security risks associated with NNSA weapon transportation operations.

- Transportation Security: Activities associated with modifications to the SafeGuards Transporter that are common to all applications. Multi-platform Transportation Security: Activities associated with development of a multi-platform transportation attachment device for all air-delivered systems.

- Weapon Unique Transportation Security: Activities associated with development of unique shipping configuration insertion for specific re-entry bodies and re-entry vehicles.

(4) Applied Research and Development (R&D) Studies – Applied R&D includes establishing system-level context and associated requirements for fundamental technology development, weapon certification and safety processes, weapons effects assessments, and vulnerability studies. Specific applications include: Independent Nuclear Weapons Assessment (INWAP): Activities associated with planning, data exchange and conducting cross laboratory assessments of weapons in the active stockpile. INWAP is tied to the Annual Assessment process via 50 United States Code 2525.

- Weapons Effects Studies: Weapons effects studies not covered by the Nuclear Survivability subprogram of the Engineering program.

- Vulnerability Studies: Studies associated with evaluating weapon-related vulnerabilities, leading to prioritized investments for risk mitigation.

- Weapon System Architecture Studies: Activities associated with defining system architectures to support future life extension and ALT programs, which improve surety and performance, reduce lifecycle costs, and provide the framework for fundamental technology development.

- Primary and Secondary Assessments: Activities associated with conducting annual assessment and certification of weapon primaries and secondaries.

- Chemistry and Material Science Assessments: Activities associated with conducting chemistry and materials science assessments related to NEPs.

- NEP System Analyses: Activities associated with developing new NEP technologies and methodologies that ensure compatibility with integrated micro-electronic systems.

(5) Base Hydrodynamic Experiments: Includes activities required to ensure the base hydro capability is available to support experiments across multiple systems and system level experiments; activities associated with maintaining the hydrodynamic material control program in support of scheduled multiple systems experiments and tests; activities associated with designing, preparing and assembling test components for multiple systems base hydrodynamic experiments and sub-critical tests; activities associated with providing inputs and updates to the National Hydro Test Plan for multiple systems; activities associated with conducting and analyzing results of hydrodynamic experiments and sub-critical tests across multiple systems; and activities associated with conducting and analyzing results of hydrodynamic experiments for certifying LEPs.

(6) Dynamic Plutonium Experiments (DPE): Includes activities to ensure the DPE events are conducted as scheduled in support of multiple systems and technology base; activities required to ensure the base DPE capability is available to support experiments across multiple systems and system level experiments; activities associated with designing, preparing and assembling test components for multiple systems of dynamic plutonium experiments; activities associated with providing inputs and updates to the DPE Test Plan for multiple systems; and activities associated with conducting and analyzing results of dynamic plutonium experiments.

(7) Department of Defense/Department of Energy Memorandum of Understanding (DoD/DOE MOU): Includes development activities supporting agreed-upon DoD/DOE joint munitions studies under the current Memorandum of Understanding.

Management, Technology, and Production (MTP)

The MTP activities provide the products, components and/or services for multi-weapon system surveillance (laboratory/flight test data collection and analysis), weapons reliability reporting to the DoD, weapon logistics and accountability, and stockpile planning. MTP funding is used to provide plant and laboratory personnel to help sustain the stockpile that includes activities relating to surveillance, weapons requirements process improvements, engineering authorizations, safety assessments, use control technologies used to keep the weapons safe, secure and available to the war fighter upon presidential release authority, containers, base spares used to maintain weapons in a safe reliable status, studies and assessments with respect to nuclear operation safety, weapon components for use in multiple weapons systems and transportation/handling gear used to safely and securely store weapons and transport weapons between DoD sites and DOE sites for use in multiple weapons systems. MTP funding is pooled across the sites for a coordinated product realization enterprise approach for information systems used to record weapon and component transactional activities, an essential program for weapon stockpile inventory and accountability reporting used to report quantities, values and status to Congress. Additionally, MTP includes weapons sustainment activities that benefit the nuclear security enterprise mission as a whole, as opposed to Production Support activities that focus on supporting internal site-specific production missions.

The MTP mission scope includes:

(1) Product Realization Integrated Digital Enterprise (PRIDE): Operation and maintenance of 44 classified electronic information management systems required for weapons accountability, vendor material purchases, viewing/transfer of design and engineering drawings, and transit for surveillance, Limited Life Component Exchanges (LLCEs), dismantlements, and weapons refurbishment & manufacturing;

(2) Weapons Training and Military Liaison: Staffing the multi-weapon subject matter experts for Unsatisfactory Reports (URs) associated with DoD's field issues for testing and handling gear, Technical Publications, and coding issues—Allows maintenance operations to return weapons back to active status;

(3) Studies and Initiatives: Currently, one initiative that identifies, prioritizes, and funds critical Uranium-related requirements (skilled labor, casting, rolling, forming and machining) that re-establishes and sustains capability at Y-12 to manufacture cases and canned sub-assemblies (CSAs) for the stockpile and a material capability required for future LEPs;

(4) General Management Support: Non-programmatic costs for program management and oversight, shared taxes, assignees and support services contracts;

(5) Assessments & Studies (Use Control): Include in-depth vulnerability assessments of nuclear weapons in the stockpile; identifying or developing and deploying common technologies to address vulnerabilities, if found; and special studies to support the decision processes for optimizing life extension program designs and for option down-select decisions by senior officials;

(6) Surveillance: Efforts that focus on multi-system, common use, or non-weapon specific activities (data capture, reliability assessments, flight test planning) directly contributing to stockpile evaluation, including activities and new capabilities for surveillance transformation—lengthened surveillance cycles (due to budget) to collect data for weapon systems could violate weapon reliability, annual assessment stockpile rationale standards, and lab/flight test requirements. Lengthening surveillance cycles increase the time that a potential defect could go undetected in the stockpile, and subsequently increase the amount of time the DoD could have a deficient nuclear deterrent;

(7) External Production Missions: Weapon Response subject matter experts across all systems and all laboratories – Weapon Response manning is critical for Pantex to return to operations in bays and cells (should an unexpected weapon condition or anomaly be observed during LLCE replacement). Weapon delivery schedules are reliant on throughput at the Pantex bays;

(8) Base Spares (Production): Activities associated with production of new non-weapon specific base spares, container, LLC forging procurements, detonators, mock HE and other weapon components;

(9) Base Spares (Maintenance): Activities associated with maintaining existing non-weapon specific base spares, test handling gear and containers, GTSs, Use Control equipment, code management switch tubes and other weapon components.

FY 2017-FY 2020 Key Milestones

Production Support (PS)

- Continue weapon assembly, weapon disassembly, component production, and weapon safety and reliability testing.
- During FY 2017, KCP continues preparation (engineering and quality) for B61 LEP non-nuclear components.
- Continue five (from two) NG production lines at SNL, requiring increased quality and calibration services.
- Continue the funding of Nuclear Enterprise Assurance at SNL & KCP.
- During F Y 2017 – FY 2019, B61-12 LEP equipment and process costs will be supported for NG and production workload increases to meet schedules.
- During FY 2017 – FY 2020, increased funding is required at Y-12 to support Lithium Direct Material Manufacturing.
- During FY 2017 – FY 2020, establish multi-year acquisition program to upgrade and integrate weapon logistics, nuclear materials accountability, production planning and scheduling systems.

- During FY 2017 – FY 2020, LANL Detonator Cable Assembly (DCA) production increases from one to five lines, requiring new equipment to enable higher yield rates, increased maintenance, improved shop floor design, and a manufacturing resource planning system to support increased production.
- During FY 2017 – FY 2020, LANL surveillance requirements in structural mock unit production and power supply surveillance increase to support the LEP schedule.

Research and Development (R&D) Support

- Further develop and demonstrate Quantification of Margins and Uncertainties (QMU) and apply QMU methodology toward assessment, certification, and qualification needs for the stockpile.
- Continue providing scientific and technical support to the production agencies to help achieve weapon production directives.
- Continue providing R&D infrastructure support at the national laboratories for archiving activities to support current Mods/Alts/LEPs and software upgrades required to certify and qualify current Mods/Alts/LEPs.

R&D Certification and Safety (RDCS)

- Continue to annually assess the safety, security, and effectiveness of the enduring weapons systems in the stockpile, reporting weapon system status ultimately to the President, and determine if an underground nuclear test is required to solve a problem.
- Continue to analyze, evaluate, and close high priority SFIs in accordance with the currently approved baseline closure plans.
- Continue design and development of LLCEs such as: NGs, GTSs, energetics, and other replacement components.
- Continue to identify other components which need to be developed and matured for future insertion opportunities to support approved MODs/Alts.
- Continue performing nuclear safety R&D studies and weapons effects studies.
- Continue to provide the infrastructure for conducting hydrodynamic tests in support of enduring stockpile systems and multiple system experiments.
- Continue supporting development of NGs (electronic and small generator types) and GTSs.
- Continue development of hardware qualification; system certification and required computer modeling and simulation activities to sustain the stockpile.
- Continue analysis of stockpile primary, secondary, chemistry, and materials systems analysis and annual assessments related to activities for the enduring stockpile.
- Continue supporting subcritical and other experiments at Nevada National Security Site.
- Continue supporting Independent Nuclear Weapon Assessment Teams activities, within the National Laboratories to assess the state of health and performance of the weapon system in support of the Annual Assessment Process.
- Continue early technical maturation of components for multiple systems.
- Initiate development of ISA shipping configurations for air-delivered weapons.
- Continue development of ISA shipping configurations for the W88 ALT 370 weapon and required modifications to the Safeguards Transporters (SGTs).

Management, Technology, and Production (MTP)

- Continue annual activities providing products, components and/or services for multi-weapon system surveillance, weapons reliability reporting to the DoD, weapon logistics and accountability, and stockpile planning.
- Use Control technology and Code Management System upgrades continue to enter the design stage.
- Increased Surveillance requirements in FY 2017 - FY 2019 due to stockpile aging projections and LEPS entering production.
- Increased weapon response activity for pit and CSA non-destructive evaluations
- Increase in flight testing support for the Tonopah Test Range.
- Maintain the required 12 month Weapon Evaluation Test Laboratory schedule cycle instead of an 18 month cycle for most weapon systems (starting in FY17).
- Maintain Uranium processing capability.
- Replacement of the multi-port test valve for the GTS function testing at Savannah River Site for all systems.

- Replacement of the nuclear security enterprise Image Management System (IMS) for authorized document production with the Product Realization Information Management Enterprise (PRIME) technology stack.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Production Support (PS) $350,942,000	**Production Support (PS) $447,527,000**	**Production Support (PS) +$96,585,000**
• Provide engineering and manufacturing operations for weapon operations (W76-1 LEP, B61-12 LEP, dismantlement, and detonator cable assembly production) to meet directive schedules including revised W76-1 LEP production rate. • Provide Labor to support Purchasing, Shipping, and Materials Management. • Provide Labor and supplies for Preventative maintenance and equipment calibrations. • Perform Product Certification (independent evaluation of build records) for auditing purposes. • Provide Quality Assurance and Procedural/Engineering Safety. • Provide Classified Computer Network operations and maintenance. • Complete shop floor modernization project at Y-12 (Momentum) in FY 2015. • Provide maintenance and troubleshooting support for 300 plus active testers. • Continue to maintain equipment and processes for neutron generator and power supply production to meet revised schedules. • Continue KCRIMS restart of operations by requalification of products and testers. • Perform Infrastructure Modernization. • Complete special projects (calorimeter reconstruction oven consolidation). • Supply Chain Risk Management startup costs and new equipment costs for Nuclear Enterprise Assurance (NEA) at KCP. • Additional Tool, Gauge & Equipment Services required at Y-12 to support increased W76-1	• Provide engineering and manufacturing operations for weapon operations (W76-1 LEP, B61-12 LEP, dismantlement, and detonator cable assembly production) to meet directive schedules including revised W76-1 LEP production rate. • Provide Labor to support Purchasing, Shipping, and Materials Management. • Provide Labor and supplies for Preventative maintenance and equipment calibrations. • Perform Product Certification (independent evaluation of build records) for auditing purposes. • Provide Quality Assurance and Procedural/Engineering Safety. • Provide Classified Computer Network operations and maintenance. • Initiate planning for shop floor modernization at LANL, Integrated-Work Execution and Production System Project (I-WEPS). • Provide maintenance and troubleshooting support for 300 plus active testers. • Continue to maintain equipment and processes for neutron generator and power supply production to meet revised schedules. • Continue KCRIMS restart of operations by requalification of products and testers. • Perform Infrastructure Modernization. • Complete special projects (Environmental Conditioning, oven consolidation, calorimeter replacement, Mass Spectrometer replacement, and classified servers). • Expand to five (from two) Neutron Generator production lines at SNL, requiring increased	• The $96,585,000 increase represents a $50,443,000 transfer of NG scope from Stockpile Systems to Production Support to maintain the base capability in NG production for multi-systems. This transfer of funding increases Production Support for the transition to the new NG cost model, which previously tied a portion of the NG infrastructure costs to weapon program funding. In addition to the transfer of NG scope, there is a $34,469,000 increase in Production Support for deferred maintenance at Y-12 for Lithium Direct Material Manufacturing and Maintenance and upkeep of production equipment in aging facilities and an $11,673,000 increase as a result of a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
production rate to meet directive schedules.	quality and calibration services. • KCP begins preparation (engineering and quality) for B61 LEP non-nuclear components. • Begin funding Nuclear Enterprise Assurance at SNL and KCP. • Y-12 W76-1 LEP plant floor and glove boxes reach steady state production (increase in upkeep of aged facilities planned to retire but now must be maintained with delay in Uranium Production Facility completion). • Deferred maintenance at Y-12 for Lithium Direct Material Manufacturing.	
Research and Development (R&D) Support $25,500,000	**Research and Development (R&D) Support $34,159,000**	**Research and Development (R&D) Support +$8,659,000**
• Further develop and demonstrate Quantification of Margins and Uncertainties (QMU) and apply QMU methodology toward assessment, certification, and qualification needs for the stockpile. • Continue to provide scientific and technical support to the production agencies to help achieve weapon production directives. • Continue providing R&D infrastructure support at the national laboratories to include archiving activities to support current Mods/Alts/LEPs and support limited software upgrades require for certification and qualification for current Mods/Alts/LEPs.	• Further develop and demonstrate Quantification of Margins and Uncertainties (QMU) and apply QMU methodology toward assessment, certification, and qualification needs for the stockpile. • Continue providing scientific and technical support to the production agencies to help achieve weapon production directives. • Reinvigorate the R&D infrastructure support at the national laboratories for archiving activities to support current Mods/Alts/LEPs and software upgrades required to certify and qualify current Mods/Alts/LEPs. • Support the operation and maintenance of the highly successful JILS tool at the three laboratories.	• The $8,659,000 represents an increase in R&D Support for a reinvigorated effort to upgrade computers and software to replace obsolete/outdated hardware and software, increased archiving of past weapon data, and operation and maintenance of the Joint Integrated Lifecycle Surety (JILS) tool.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
R&D Certification and Safety (R&D C&S) $160,000,000	**R&D Certification and Safety (R&D C&S) $192,613,000**	**R&D Certification and Safety (R&D C&S) +$32,613,000**
• Continue to annually assess the safety, security, and effectiveness of the enduring weapons systems in the stockpile, reporting weapon system status ultimately to the President, and determine if an underground nuclear test is required to solve a problem. • Continue to analyze, evaluate, and close high priority SFIs in accordance with the currently approved baseline closure plans. • Continue design and development of GTS for B83 and W87 Alts. • Continue development of High Efficiency Adaptable TM Transmitter for W88 ALT 370. • Continue upgrade of the Code Management System for the legacy stockpile. • Resume design and development of LLCEs such as NGs, GTSs, energetics, and other replacement components. • Continue to identify other components which need to be developed and matured for future insertion opportunities to support approved MODs/Alts. • Continue performing nuclear safety R&D studies and weapons effects studies. • Continue to provide the infrastructure for conducting hydrodynamic tests in support of enduring stockpile systems and multiple system experiments. • Continue surety development. Continue development of hardware qualification; system certification and required computer modeling and simulation activities to sustain the stockpile. • Continue analysis of stockpile primary, secondary, chemistry, and materials systems analysis and annual assessments related to activities for the	• Continue to annually assess the safety, security, and effectiveness of the enduring weapons systems in the stockpile, reporting weapon system status ultimately to the President, and determine if an underground nuclear test is required to solve a problem. • Continue to analyze, evaluate, and close high priority SFIs in accordance with the currently approved baseline closure plans. • Continue design and development of GTS for the W87 Alt. • Continue development of High Efficiency Adaptable TM Transmitter for W88 ALT 370. • Continue upgrade of the Code Management System for the legacy stockpile. • Continue design and development of LLCEs such as NGs, GTSs, energetics, and other replacement components. • Continue to identify other components which need to be developed and matured for future insertion opportunities to support approved MODs/Alts. • Continue performing nuclear safety R&D studies and weapons effects studies. • Continue to sustain the infrastructure for conducting hydrodynamic tests in support of enduring stockpile systems and multiple system experiments. • Continue surety development. Continue development of hardware qualification; system certification and required computer modeling and simulation activities to sustain the stockpile. • Continue analysis of stockpile primary, secondary, chemistry, and materials systems analysis and annual assessments related to activities for the	• The $32,613,000 increase represents additional multi-system technology development activities to replace aging components for the enduring stockpile, continuing hydrodynamic and dynamic plutonium experiments, additional analysis to support the Independent Nuclear Weapon Assessment Process (INWAP), additional studies to support primary and secondary assessments and the nuclear explosive package, Nuclear Safety Research and Development (NSRD) investigations to ensure nuclear explosive and material activities are conducted safely and do not pose risk to personnel, the environment, or weapon systems, an increase in Weapon Component Development activities to address current and emerging stockpile issues through continued early technology development activities, and the realignment of $31,000,000 from Integrated Surety Architectures (ISA) to Stockpile Systems to support weapon specific ISA scope for the W88.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
enduring stockpile. • Continue supporting subcritical and other experiments at Nevada National Security Site. • Continue supporting Independent Nuclear Weapon Assessment Teams activities, within the National Laboratories to assess the state of health and performance of the weapon system in support of the Annual Assessment Process. • Complete technical maturation of select B61-12 LEP components. • Resume development of thermal battery, surety components, abnormal launch accelerometer, and detonation monitoring assembly. • Begin development of aluminum reservoir, radar improvements, and small advanced fireset with enhanced technology.	enduring stockpile. • Continue supporting subcritical and other experiments at Nevada National Security Site. • Continue supporting Independent Nuclear Weapon Assessment Teams activities, within the National Laboratories to assess the state of health and performance of the weapon system in support of the Annual Assessment Process. • Continue development of thermal battery, surety components, abnormal launch accelerometer, and detonation monitoring assembly. • Continue development of aluminum reservoir, radar improvements, and small advanced fireset with enhanced technology.	
Management, Technology, and Production (MTP) $226,000,000	**Management, Technology, and Production (MTP) $264,994,000**	**Management, Technology, and Production (MTP) +$38,994,000**
• Execute surveillance activities in accordance with FY 2015 Program Control Documents, and FY 2015 Integrated Weapon Evaluation Team Plans. • Study options to improve safety and use control technologies for the B61-12 LEP and future LEPs. • Manage applications required for realizing weapon products and ensure that correct, high-quality information is shared with those who require it at all locations in a secure and timely way. • Respond to DoD Unsatisfactory Reports about issues with the stockpile and provide DoD training on weapons maintenance activities in the field. • Perform production and maintenance of test and handling gear, spare parts for DoD, and containers. • Execute production of weapon components for use in multiple weapon systems (examples: Batteries, Stronglinks, switch tubes, polymers, and	• Execute surveillance activities in accordance with FY 2016 Program Control Documents, and FY 2016 Integrated Weapon Evaluation Team Plans. Includes critical deferred & required multi-system surveillance activities to include testing requirements for the LEPs. • Add multi-system weapon response and external production resources to provide safety studies for un-interrupted assembly/disassembly operations at production plants. • Replace the nuclear security enterprise Image Management System (IMS) for authorized document production with the Product Realization Information Management Enterprise (PRIME) technology stack. • Study options to improve safety and use control technologies for the B61-12 LEP and future LEPs.	• The $38,994,000 increase represents additional work scope of $20,521,000 and programmatic adjustments of$18,473,000 within MTP. The work scope increase of $20,521,000 is associated with multi-system surveillance activities, including preparation for returning to a 12-month weapon surveillance cycle (currently 18-months), start-up of the replacement surveillance valve program for gas transfer systems, the increased workload associated with surveillance for additional LEP-type systems, and the purchase of a replacement drive control system for the primary 50,000 g-lb, 8-foot arm centrifuge. Additional work scope includes multi-weapon response resources (production safety subject matter experts) to come online to continue safe assembly/disassembly operations at production

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
containers). • Conduct program management and oversight of weapon sustainment activities. • Maintain Uranium processing capability. • Conduct Maintenance and Operations Program Management. • Conduct weapons Use Control Studies.	• Perform Operations & Maintenance of the Integrated Digital Enterprise to collect, process, store, and transmit data among the nuclear security enterprise design and production agencies. Respond to DoD Unsatisfactory Reports about issues with the stockpile. • Provide DoD training on weapons maintenance activities in the field. • Perform production and maintenance of test and handling gear, spare parts for DoD, and containers. • Execute production of weapon components for use in multiple weapon systems (examples: Batteries, Stronglinks, switch tubes, polymers, and containers). • Conduct program management and oversight of weapon sustainment activities. • Maintain Uranium processing capability. • Conduct weapons Use Control Studies. • Replacement of the multi-port test valve for the GTS function testing at Savannah River Site for all systems.	plants and the replacement of the classified Image Management System (IMS) used for authorized document production across the nuclear security enterprise, as the current platform is no longer supported by the vendor and is the backbone of design transfer for the LEPs entering production. Programmatic adjustments of $18,473,000 include the FY 2015 Consolidated Appropriations Act reduction from the President's Budget Request $15,805,000 of deferred work scope in FY 2016, a surveillance work scope transfer of $1,400,000 from R&D C&S to MTP to align laboratory surveillance testing, and the CNS cost model adjustment of $1,268,000.

Nuclear Material Commodities

Description

The Nuclear Material Commodities program has been developed to consolidate management of nuclear material processing capabilities within the nuclear security enterprise. The program incorporates the existing Plutonium and Tritium Sustainment activities from DSW Stockpile Services, Domestic Uranium Enrichment from Weapons Activities and adds a new Uranium Sustainment activity. The addition of a Uranium Sustainment line is consistent with recommendations of the Final Report of the Committee to Recommend Alternatives to the Uranium Processing Facility Plan in Meeting the Nation's Enriched Uranium Strategy (also known as the Red Team Report).

Uranium Sustainment

The Uranium Sustainment Program mission expands and accelerates the Area 5 De-inventory efforts to reduce safety risks, implements a new model of near just-in-time material inventories, and increases the reliability of uranium capabilities through the replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts. Additional uranium investments are also made under the Processing Technology Development subprogram within Advanced Manufacturing Development.

The Uranium Sustainment mission scope includes

(1) Expand and accelerate the Y-12 Area 5 De-inventory efforts to reduce safety, security, and mission risks by:

a. Continue developing metrics to measure Material-at-Risk (MAR) reduction based on material types and contributions to off-site dose.
b. Reduce administrative building limits for MAR.
c. Further accelerate the movement of weapon assemblies and materials to the Highly Enriched Uranium Materials Facility.
d. Perform additional safety analysis and material characterization in support of material disposition.
e. Establish processes in existing facilities to stop the flow of material in to Building 9212.

(2) Implement a new model for near just-in-time material inventories.

(3) Sustain and increase the reliability of uranium capabilities through replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts.

Additional work related to the Uranium Strategy and ceasing enriched uranium programmatic operations in Building 9212 by 2025 is described in the Processing Technology Development line within the Advanced Manufacturing Development program.

Plutonium Sustainment

The NNSA Plutonium Sustainment Program mission is to provide a plutonium-based component manufacturing capability at reliable capacities that enables nuclear weapon planners and designers to sustain a safe, secure, and effective nuclear arsenal and plan for reduced nuclear stockpiles. The Program provides the equipment and personnel necessary to fabricate plutonium pits, qualify and certify produced pits for stockpile use, and manufacture precision plutonium devices for science-related evaluation. Additionally, the Program recovers ^{238}Pu for Defense Programs and invests in ^{238}Pu-related capabilities for the stockpile.

The Plutonium Sustainment mission scope includes:

(1) Investments in equipment and process design to support reconstitution of power supply manufacturing and assembly capability (that once existed at the Mound and Pinellas facilities) for Defense Programs;

(2) Plutonium pit process engineering, process qualification, pit manufacturing, pit manufacturing equipment and personnel, pit fabrication tooling design and manufacturing, and non-nuclear pit component manufacturing;

(3) Design laboratory and production plant activities for plutonium stockpile product development; **(4)** Engineering and physics-based evaluation and testing of development pits necessary for war reserve production;

(5) Fabrication of design definition development pits that explores new design features;

(6) Fabrication of plutonium devices for science and stockpile-related subcritical experiments;

(7) Recovery and reclamation of strategic quantities of ^{238}Pu for stockpile needs;

(8) Plutonium manufacturing capability such as radiological control program, facility and equipment maintenance, criticality safety program, laundry services, shipping and receiving, authorization basis, work control documentation, training and qualification, spare parts; and

(9) A variety of LANL and readiness activities including waste management, storage capability, and nuclear operations infrastructure and facility configurations.

Tritium Sustainment

The Tritium Readiness Program operates the national capability for producing tritium and is taking steps to build additional capacity required for national security requirements. Since October 2003, NNSA has been producing tritium by irradiating tritium-producing burnable absorber rods (TPBARs) in the Watts Bar Unit 1 (WBN1) nuclear power reactor operated by the Tennessee Valley Authority (TVA), during the normal 18 month operating cycles. Annual extractions of tritium from TPBARs at the Tritium Extraction Facility (TEF) at DOE's Savannah River Site began in 2007. Plans are being initiated to make additional production capacity available by gaining Nuclear Regulatory Commission (NRC) approval of a reactor safety analysis to allow irradiating more than the current limit of 704 TPBARs per cycle, and also for increasing the effluent release limit at Watts Bar, supported by a Supplemental Environmental Impact Statement (SEIS). The program continues to maintain a contingency option to use TVA's Sequoyah Units 1 and 2 reactors to meet tritium production requirements if needed. The tritium inventory is needed to support limited life component exchanges (LLCEs) for tritium reservoirs that are deployed in the stockpile. NNSA coordinates with the DoD to determine stockpile requirements, and provides annual updates to DoD on tritium production and inventory status. Tritium is not consumed in the stockpile but radioactively decays at approximately 5.5% per year, requiring ongoing replenishment. Long-term tritium production schedules, based on detailed computational models, are carefully calibrated to provide the required and reserve amounts, and production planning takes into consideration the material that is constantly being recovered and recycled from deployed reservoirs including those from dismantlements.

The Tritium Sustainment mission scope includes:

(1) TPBAR Technology: Tritium production requires active design, surveillance, and research and development efforts to support irradiation of TPBARs by TVA. This includes post-irradiation examination of limited use assembly TPBARs to evaluate the performance effects of design refinements, as well as providing the technical evaluation, monitoring, and analysis required by the NRC. Test and evaluation efforts in Idaho National Laboratory's Advanced Test Reactor are required to understand the time-release performance of the lithium-aluminate pellets and to evaluate pellet configurations with less volume. Void volume in the TPBAR is a limiting factor on TPBAR failures in a reactor accident, and thinner pellets may be able to increase internal void volume, reducing internal pressure, and improving results for the reactor safety analysis needed to support NRC licensing for increased production. Reduced internal pressure may also reduce the permeation release of tritium from the TPBARs to the reactor coolant system and to the environment. In addition, other tests are required to understand indications of an in-reactor TPBAR failure, a dropped TPBAR in the spent fuel pool, and the shelf-life limitation and storage requirements for TPBAR components.

(2) TPBAR Fabrication: TPBAR fabrication involves commercial contracts for maintaining the fabrication prime contractor and its subcontractor supply chain to provide a dozen specialized components and assemble these into TPBARs required to meet each 18 month refueling cycle at TVA's WBN1 reactor. This includes maintaining two vendors that provide the classified processes for producing the plated zircaloy getters and the specially coated stainless steel cladding tubes that, respectively, enable the TPBAR to trap tritium within and minimize its permeation to the reactor coolant system. The TPBAR fabrication vendor must also restart production of zircaloy liners and lithium-aluminate pellets that were produced in a very large batch more than 10 years ago and are now running out.

(3) TPBAR Irradiation: The production of tritium occurs in TVA's nuclear reactor when lithium-aluminate pellets in the TPBAR are bombarded by energy neutrons over a period of 18 months. DOE and TVA entered into an Interagency

Agreement in 1999 under which TVA provides irradiation services in accordance with the national security provision in TVA's original charter. This Interagency Agreement is subject to the Economy Act that requires TVA to be reimbursed for all tritium related costs but no profit. There are two main costs associated with providing reactor fuel for tritium production. TVA computes the cost of reactor fuel with and without TPBARs and invoices NNSA for the cost of the excess fuel required. When the non-proliferation implications of using TVA's commercial reactor for tritium production were addressed in an interagency report to Congress in July 1998, it said, "to minimize divergence from the military/civilian dichotomy, the Department should fuel such a reactor exclusively with U.S. low enriched uranium fuel that was unencumbered by peaceful use pledges." This requires that TVA acquire unobligated low enriched uranium (LEU) fuel and that NNSA pay any difference in the price of unobligated enrichment compared to fuel TVA obtains for its Brown's Ferry reactors on the open market. At present unobligated fuel purchased by TVA will come from Energy Northwest, who entered into an arrangement in May 2012 to have a quantity of DOE's high assay tails (depleted uranium) enriched at the Paducah Gas Diffusion Plant before it was shut down in May 2013. At that time, the enrichment price to TVA was set at $150 per separate work unit (SWU) in FY 2012 dollars, escalated at two percent a year. The subsequent softening of the uranium fuel market after the Fukushima event has caused the enrichment price differential payments to increase significantly in the out-years compared to original estimates.

(4) TPBAR Transportation: After the TPBARs are irradiated for 18 months, the radioactive TPBARs are loaded into consolidation canisters, placed in specialized shipping casks, and trucked from TVA to the Tritium Extraction Facility (TEF) at the Savannah River Site (SRS). This transportation, which also provides for commercial security protection for the shipments, is handled by a commercial contractor under long-term contract to NNSA. In addition, radioactive-contaminated hardware fixtures must be transported to the Nevada National Security Site for disposal after each irradiation cycle.

(5) TPBAR Extraction: TPBAR extraction takes place at the TEF at SRS. TPBARs are received from shipments from TVA in batches of up to 300 TPBARs per canister. Prior to extraction, the TPBARs are prepared by cutting the heads off each individual rod. After this process, a canister containing all the headless TPBARs is moved into the extraction furnace where a special vacuum-thermal process is employed to extract the tritium. Once waste gases are separated from the product gas, the purified tritium is piped directly to the loading and unloading facility, next door at SRS, where it is loaded into gas transfer systems to meet the schedule for limited life component exchanges for deployed units under custody of the Department of Defense. Since starting, the TEF has been conducting one extraction a year. In FY 2016, the TEF will be conducting two extractions in succession. This is to exercise and evaluate the processes that will be required when the TEF must go to a full operations mode in FY 2018, extracting three or four times a year. In FY 2017, the TEF will go back to its normal responsive operations mode, where personnel are rotated to other buildings and tasks when not involved in extraction operations. Under responsive operations, the staff is approximately 55 full-time equivalents (FTEs) for 9 months of the year and approximately 65 FTEs for the 3 months when an extraction is being conducted. In addition to maintaining the facility in a state of operational readiness and conducting periodic extractions, this $500M facility requires a number of infrastructure improvement and upkeep projects, some of which span multiple years. The FY 2016 project work will include completion of a direct stacking capability for the TEF and the installation of wireless air monitors. These projects must be completed before the TEF can transition to full operations in FY 2018.

Domestic Uranium Enrichment

The Domestic Uranium Enrichment (DUE) Program mission supports the development of a reliable and economic domestic uranium enrichment capability. These objectives include providing uranium to support the tritium production mission as well as varying uranium assays and forms to maintain the nuclear weapons stockpile and provide fuel for naval reactors and research reactors. The form and detail of the program is based in part on defense program requirements for unobligated and unencumbered low enriched uranium (LEU) and the results of an ongoing interagency effort to determine what actions are needed and when those actions need to be taken to acquire additional LEU. Of primary importance is identifying LEU unobligated uranium sources for tritium production beyond 2025-2030. The DUE O&M subprogram will continue to maintain the current centrifuge capability in warm standby and supports the analysis of the uranium inventory, uranium enrichment technology options study, and a cost analysis for build out of the existing centrifuge technology. DUE also will preserve the option to continue operating a centrifuge research, development and demonstration project while continuing to explore the technological readiness and financial viability of enrichment technologies including centrifuges.

The Domestic Uranium Enrichment mission scope includes:

- Analyses of available unobligated and unencumbered low enriched uranium (LEU), tritium needs, and suitable high enriched uranium (HEU) for down blending.
- Exploring options to continue operating a centrifuge research, development and demonstration project.
- Exploring the technological readiness and financial viability of other enrichment technologies.
- Maintain the current centrifuge capability in warm standby.

FY 2017-FY 2020 Key Milestones

Uranium Sustainment

- Continue reducing safety and security risks through the Area 5 De-inventory efforts by further accelerating the movement of weapon assemblies and materials to the Highly Enriched Uranium Materials Facility, performing additional safety analysis and material characterization in support of material disposition, and re-engineering process flows to stop the flow of material in to Building 9212.
- Support additional efforts to sustain and increase the reliability of uranium capabilities through the replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts.

Plutonium Sustainment (Pu Sus)

- Continue investments in replacing aged, end-of-life pit manufacturing equipment (acquire, install, configure, authorize for operation).
- Build W87 design developmental pits each year to sustaining fabrication capability.
- Perform engineering evaluation of development pits (pit certification).
- Support reconstitution of Power Supply capability.
- Complete ^{238}Pu recovery.
- Participate in the LANL Landlord Cost Recovery Program based on services for: distributed, non-fixed operating costs (usually equated to space used) in the plutonium facility; analytical chemistry distributed variable, non-fixed costs; and waste processing distributed, non-fixed costs.

Tritium Readiness

- Conduct successively increasing TPBAR irradiation cycles at TVA to begin producing 1700 grams per cycle by FY 2022. Utilize unobligated reactor fuel obtained by TVA from Energy Northwest under the Depleted Uranium Enrichment Project.
- Provide technical production support and surveillance for tritium production operations at TVA by the TPBAR design authority to ensure technical oversight in support of TVA and NRC requirements.
- Continue performance tests on tritium-producing lithium-aluminate pellets in the Advanced Test Reactor at Idaho National Laboratory and conduct post irradiation examinations and data analysis.
- Continue to improve understanding of in-reactor TPBAR performance to reduce program risks and improve the safety and reliability of the tritium production process.
- Obtain NRC approval for an improved reactor safety analysis to reduce on-going reactor fuel requirements.
- Maintain the TEF in Responsive Operations mode, conduct one extraction per year, and perform infrastructure improvement projects for control systems and facilities to begin to prepare TEF for Full Operations in the future.
- In FY 2022, transition the TEF from Responsive Operations to Full Operations mode conducting multiple extractions annually.
- Fabricate TPBARs to meet 18-month reactor cycles, initiate contracts to restart production of major TPBAR components, and maintain the related component supply chain.
- Provide transportation for irradiated TPBARs from each cycle at WBN1 to the TEF and for post irradiation examinations.
- Provide transportation for disposal of tritium program radioactive waste from base plates and thimble plugs from TVA to the Nevada National Security Site.
- March 2017 - Complete irradiation of 704 TPBARs in WBN1 Cycle 14.
- April 2017 - Commence irradiation of 1,104 TPBARs in Cycle 15 at WBN1.
- September 2018 - Complete irradiation of 1,104 TPBARs in WBN1 Cycle 15.
- October 2018 - Commence irradiation of 1,504 TPBARs in Cycle 16 at WBN1.
- March 2020 – Complete irradiation of 1,504 TPBARS in WBN1 Cycle 16.
- April 2020 – Commence irradiation of 1,792 TPBARS in Cycle 17 at WBN1.

Domestic Uranium Enrichment

- Milestones will be identified as program priorities are identified through the interagency process.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Uranium Sustainment $7,400,000	**Uranium Sustainment $32,916,000**	**Uranium Sustainment +$25,516,000**
• Reflects funding appropriated for the Storage program to execute the Area 5 De-inventory.	• Expand and accelerate Area 5 De-inventory efforts to reduce safety, security, and mission risks. • Implement a new model for near just-in-time material inventories • Sustain and increase the reliability of uranium capabilities through replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts.	• Increase of $25,516,000 represents a new line of DSW funding to consolidate non-MIE investments necessary to reduce safety, security, and mission risks, sustain the uranium mission, and support ceasing enriched uranium programmatic operations in Building 9212 by 2025. • These investments include the expanded and accelerated Area 5 De-inventory efforts. • Implementing a new model for near just-in-time material inventories. • Sustain and increase the reliability of uranium capabilities through replacement of obsolete non-capital equipment, increased equipment maintenance, and the purchase of critical spare parts.
Plutonium Sustainment $132,000,000	**Plutonium Sustainment $174,698,000**	**Plutonium Sustainment +$42,698,000**

• Maintain base personnel and sustain pit-manufacturing capability.
• Continue upgrades and investments for end-of-life equipment (acquire, install, configure, authorize for operation).
• Build W87 design developmental pits.
• Conduct engineering evaluation of development pits (pit certification).
• Support reconstitution of Power Supply capability
• Recover ^{238}Pu.
• Fabrication of plutonium experimental device.
• Participate in the LANL Landlord Cost Recovery Program based on beneficial services for: distributed, non-fixed operating costs (usually equated to space used) in the plutonium facility;
	• Continue to maintain base personnel and sustain pit-manufacturing capability.
	• Continue to upgrade end-of- life equipment vital to the pit manufacturing mission by significant equipment investments necessary for modernization in capability, capacity and certification (acquire, install, configure, authorize for operation).
	• Continue W87 design developmental pit builds.
	• Conduct engineering evaluation of development pits (pit certification).
	• Continue to support reconstitution of Power Supply capability.
	• Continue recovery of ^{238}Pu.
	• Continue to fabricate the plutonium experimental
		• The $42,698,000 increase between FY 2016 and FY 2015 represents additional investment in pit manufacturing capability modernization and pit certification capability including:
		  • Continue equipment upgrade of 2nd and 3rd plutonium furnaces at LANL.
		  • Continue replacement of Coordinate Measuring Machines at LANL.
		  • Acquire and install new Computer Controlled Numerical (CNC) waste banding lathe and dimensional inspection box.
		  • Foundry configuration, process development, and authorization of 1st furnace.
		  • Electron Beam Welder configuration, process development, and authorization.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
analytical chemistry distributed variable, non-fixed costs; and waste processing distributed, non-fixed costs.	device. • Participate in the LANL Landlord Cost Recovery Program based on services for: distributed, non-fixed operating costs (usually equated to space used) in the plutonium facility; analytical chemistry distributed variable, non-fixed costs; and waste processing distributed, non-fixed costs.	• Plutonium capability at LLNL for pit certification
Tritium Sustainment $140,053,000	**Tritium Sustainment $107,345,000**	**Tritium Sustainment -$32,708,000**
• Complete irradiation of 704 TPBARs during TVA's Watts Bar reactor Cycle 13, reimbursing TVA for irradiation services, management and engineering support, additional reactor fuel, and enrichment price differentials for purchasing unobligated fuel from USEC and Energy Northwest for the three reactors covered in the DOE-TVA Interagency Agreement. • Submit a license amendment request (LAR) to the NRC and develop a TPBAR temperature model to support improved reactor safety analysis to reduce reactor fuel requirements and improve reactor operating margins in the future. • Maintain the Tritium Extraction Facility (TEF) in responsive operations mode, conduct one TPBAR batch extraction, and perform infrastructure upkeep and improvement projects to prepare TEF for Full Operations in the future. • Provide technical production support and surveillance of TVA production operations by the TPBAR design authority in support of TVA and NRC requirements and to reduce program risks and improve the safety and reliability of tritium production. • Commence in-reactor testing on tritium-producing lithium-aluminate pellets in the Advanced Test Reactor at Idaho National Laboratory to improve	• Commence irradiation of 704 TPBARs during TVA's Watts Bar reactor Cycle 14, reimbursing TVA for irradiation services, management and engineering support, additional reactor fuel, and enrichment price differentials for purchasing unobligated fuel from Energy Northwest intended for Watts Bar Unit 1. • Prepare a second LAR to the NRC and based on the TPBAR temperature model to support improved reactor safety analysis to reduce reactor fuel requirements and improve reactor operating margins. • Maintain the TEF in responsive operations mode, conduct two TPBAR batch extractions, and perform infrastructure projects to prepare TEF for full operations in FY 2022. • Provide technical production support and surveillance of TVA production operations by the TPBAR design authority in support of TVA and NRC requirements and to reduce program risks and improve the safety and reliability of tritium production. • Complete first run of in-reactor testing on tritium-producing lithium-aluminate pellets in the Advanced Test Reactor at Idaho National Laboratory to improve safety and performance. • Begin fabrication of 1280 TPBARs for reactor Cycle	• The $32,708,000 decrease between FY 2016 and FY 2015 represents: • Reductions at TVA of $24,000,000 due to decreased fuel deliveries from Energy Northwest as specified in the Depleted Uranium Enrichment Project fuel delivery schedule. • Reductions of $3,000,000 in the cost of infrastructure projects at the TEF. • Reduction of $4,000,000 in the cost of development and testing efforts at the design agent and other labs. • Increase of $2,000,000 due to fabrication of TPBARs and procurement of components. • Reduced payments of $3,000,000 for transportation operations, due to reduced shipments in an off-year related to 18-month reactor cycles.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
safety and performance. Fabricate 704 TPBARs for next 18-month reactor cycle; award contracts to restart production of TPBAR pellets and liners, and maintain the component supply chain.	15; award contracts to transfer getter plating from the design agent to the TPBAR fabricator, and maintain the component supply chain. Ship TPBARs from TVA to the TEF.	
Domestic Uranium Enrichment $97,200,000	**Domestic Uranium Enrichment $100,000,000**	**Domestic Uranium Enrichment +$2,800,000**
• DUE Operations and Maintenance (O&M) supports the development of a domestic supply of enriched uranium for the USG without peaceful use restrictions. This effort supports the U.S. national security and non-proliferation mission objectives of providing uranium to support the tritium production mission as well as varying uranium assays and forms to maintain the nuclear weapons stockpile and provide fuel for naval reactors and research reactors.	• DUE Operations and Maintenance (O&M) supports the development of a domestic supply of enriched uranium for the USG without peaceful use restrictions. This effort supports the U.S. national security and non-proliferation mission objectives of providing uranium to support the tritium production mission as well as varying uranium assays and forms to maintain the nuclear weapons stockpile and provide fuel for naval reactors and research reactors.	• The $2,800,000 increase continues to maintain the current centrifuge capability in warm standby and supports the analysis of the uranium inventory, uranium enrichment technology options study, and a cost analysis for build out of the existing centrifuge technology.

Directed Stockpile Work Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Annual Warheads Certification – Annual percentage of warheads in the stockpile that are safe, secure, reliable, and available to the President for deployment.							
Target	100% of stockpile certified	100% of stockpile certified	100% of stockpile certified	100% of stockpile certified	100% of stockpile certified	100% of stockpile certified	100% of stockpile certified
Result	100						
Endpoint Target	Annually, maintain 100% of warheads in the stockpile as safe, secure, reliable, and available to the President for deployment. Note: This performance measure is used to track progress on the Nuclear Weapons agency priority goal.						
Retired Weapons Systems Dismantlement – Complete the dismantlement of all weapon systems in excess to stockpile requirements per approved annual schedule published in the Planning and Program Directive (P&PD), Program Control Document (PCD), and the Requirements and Planning Document (RPD) "annual" documentation with a goal of balancing dismantlement work by mitigating gaps in future stockpile reductions.							
Target	100% of annual planned dismantlements	100% of annual planned dismantlements	100% of annual planned dismantlements	100% of annual planned dismantlements	100% of annual planned dismantlements	100% of annual planned dismantlements	100% of annual planned dismantlements
Result	100						
Endpoint Target	Maintain a balance between production and steady state stockpile reduction dismantlement program. The Dismantlement Annual Performance Goal was changed to complete the recommendation against the finding in the **GAO Report**: GAO-14-206C, Nuclear Weapons: Actions Needed by NNSA to Clarify Dismantlement Performance Goal, April 2014. Note: This performance measure is used to track progress on the Nuclear Weapons agency priority goal.						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Steady State W76-1 LEP Production – The percentage of planned builds equal to the percentage of allocated funding as represented in the annual Selected Acquisition Report (SAR).							
Target	100% of scheduled unit builds	100% of scheduled unit builds	100% of scheduled unit builds	100% of scheduled unit builds	100% of scheduled unit builds	100% of scheduled unit builds	100% of scheduled unit builds
Result	100						
Endpoint Target	Complete production of the NWC-approved W76-1 LEP production schedule by FY 2019. Baseline Change Request was approved on April 23, 2013 to combine the **LEP Production Costs** and **W76-1 LEP** metrics into a single metric beginning in FY 2014. This new metric **Steady State W76-1 LEP Production** represents the new single metric. As result of the funding being transferred from the W76 LEP to support the W88 ALT 370 CHE Refresh, additional risk is added to the program that may impact the production and delivery of the units starting in FY 2017. NNSA will continue to monitor the program and make changes as necessary in the future. Note: This performance measure is used to track progress on the Nuclear Weapons agency priority goal.							
Tritium Production – Cumulative number of Tritium-Producing Burnable Absorber Rods irradiated in Tennessee Valley Authority reactors to provide the capability of producing new tritium to support national security requirements.							
Target	2,416 TPBARs	3,120 TPBARs	3,120 TPBARs	3,824 TPBARs	5,104 TPBARs	5,104 TPBARs	6,768 TPBARs
Result	2,416						
Endpoint Target	By the end of FY 2020, complete irradiation of 6,768 Tritium-Producing Burnable Rods (TPBARs) to provide tritium for nuclear weapons. Note: Irradiation of TPBARs is completed every 18 months, or 1.5 years, in approximately October or March. For FY 2016, the irradiation cycle started in October of 2015 and will be complete in March of 2017. Thus, there is no increase to the number of TPBARs irradiated in FY 2016 and, for the same reason; there is no increase in the number of TPBARs from FY 2018 to FY 2019.						

Directed Stockpile Work
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	650,988	241,056	86,698	86,698	87,661	157,801	+70,140
Plant Projects (GPP) (<$10M)	57,073	35,236	1,955	1,955	4,498	9,542	+5,044
Total, Capital Operating Expenses	**708,061**	**276,292**	**88,653**	**88,653**	**92,159**	**167,343**	**+75,184**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	395,207	203,057	62,661	62,661	64,040	65,449	+1,409
Machine Tool Upgrades, Y-12	10,000	0	0	0	0	2,500	+2,500
Non Destructive Laser Gas Sampling (NDLGS) Cart, PX	15,000	0	0	0	0	5,000	+5,000
5-Axis Milling Machine Replacement (2 each) - High Explosives, PX	5,000	0	0	0	0	5,000	+5,000
Vertical Turret Lathe Replacement (3 each) - High Explosives, PX	6,300	0	0	0	0	6,300	+6,300
5-Axis Milling Machine Replacement (2 each) - Insensitive High Explosives, PX	5,000	0	0	0	0	5,000	+5,000
Vertical Turret Lathe Replacement (3 each) - Insensitive High Explosives, PX	6,300	0	0	0	0	6,300	+6,300
Mass Properties Equipment Replacement, PX	3,200	0	0	0	0	3,200	+3,200
Non Destructive Laser Gas Sampling (NDLGS), Y-12	2,891	0	1,600	1,600	1,291	0	-1,291
X-Ray Machine, Y-12	16,100	0	6,500	6,500	0	5,000	+5,000
SNM Vehicle, Y-12	5,509	5,545	(36)	(36)	0	0	0
Large Bed Mill/Lathe, Y-12	3,267	0	0	0	0	2,178	+2,178
Coordinate Measurement Machine #1, PX	14,625	0	0	0	0	3,118	+3,118
Coordinate Measurement Machine #2, PX	10,775	0	0	0	0	850	+850
Cabinet MicroFocus Computed Tomography, PX	3,000	0	0	0	0	1,500	+1,500
MicroFocus Cabinet Computed Tomography for High Explosives Extrudable Inspection & Acceptance, PX	3,000	0	0	0	0	3,000	+3,000
Staging Robot Replacement, PX	3,600	0	0	0	0	3,600	+3,600
Radiography Modernization (Component Staging Facility Linac L-200), PX	4,100	0	0	0	0	4,100	+4,100
Radiography Modernization (Linac L-3000A & Gantry System), PX	4,800	0	0	0	0	4,800	+4,800

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Radiography Modernization LINAC - 9 MeV Replacement, PX	3,200	0	0	0	0	3,200	+3,200
Radiography Modernization LINAC - 420 keV Replacement (2) (components), PX	4,600	0	0	0	0	4,600	+4,600
Radiography Modernization LINAC - 9 MeV Replacement (component), PX	3,200	0	0	0	0	3,200	+3,200
Sampling and Backfill Stations Modifications, PX	6,000	0	0	0	0	2,000	+2,000
Eight Plane Radiography - Evaluation of Internal SNM Material, PX	2,500	0	0	0	0	500	+500
Electro Refining (ER) Line Upgrade, LANL	37,954	32,454	4,500	4,500	1,000	0	-1,000
Coordinate Measurement Machine #1, LANL	24,081	0	2,681	2,681	7,200	6,000	-1,200
Coordinate Measurement Machine #2, LANL	19,500	0	0	0	2,200	6,000	+3,800
Replacement of Electronic Beam Welder #1, LANL	9,000	0	3,620	3,620	5,380		-5,380
Replacement of Electronic Beam Welder #2, LANL	7,000	0	0	0	2,700	3,300	+600
CNC Waist Banding Lathe #1, LANL	6,000	0	893	893	1,350	1,539	+189
Precision Machining, LANL	6,279	0	4,279	4,279	2,000	0	-2,000
Dimensional Inspection Box, LANL	4,000	0	0	0	500	567	+67
Total, Capital Equipment (including MIE)	**582,089**	**241,056**	**64,230**	**64,230**	**64,698**	**134,333**	**+69,635**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	41,231	35,236	1,955	1,955	1,998	2,042	+44
Replace GTS Unloading Lasers, SRS	5,000	0	0	0	2,500	2,500	0
Replace Film Radiography in Finishing Gloveboxes, SRS	6,500	0	0	0	0	3,000	+3,000
FTS DAS Upgrade Project, SRS	4,000	0	0	0	0	2,000	+2,000
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**56,731**	**35,236**	**1,955**	**1,955**	**4,498**	**9,542**	**+5,044**
Total, Capital Summary	**638,820**	**276,292**	**66,185**	**66,185**	**69,196**	**143,875**	**+74,679**

Outyears for Directed Stockpile Work

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	106,407	95,412	84,198	78,972
Plant Projects (GPP) (<$10M)	7,587	2,133	2,180	2,228
Total, Capital Operating Expenses	**113,994**	**97,545**	**86,378**	**81,200**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	66,889	68,361	69,865	71,402
Machine Tool Upgrades, Y-12	2,500	2,500	2,500	0
Non Destructive Laser Gas Sampling (NDLGS) Cart, PX	5,000	5,000	0	0
X-Ray Machine, Y-12	4,600	0	0	0
Large Bed Mill/Lathe, Y-12	1,089	0	0	0
Coordinate Measurement Machine #1, PX	2,267	3,000	4,000	2,240
Coordinate Measurement Machine #2, PX	2,795	2,000	3,000	2,130
Cabinet MicroFocus Computed Tomography, PX	1,500	0	0	0
Radiography Modernization LINAC - 9 MeV Replacement, PX	0	0	0	3,200
Sampling and Backfill Stations Modifications, PX	2,000	2,000	0	0
Eight Plane Radiography - Evaluation of Internal SNM Material, PX	1,000	1,000	0	0
Pit Reuse/Surveillance Workstation Modifications, PX	2,500	2,500	2,500	0
Coordinate Measurement Machine #1, LANL	6,200	2,000	0	0
Coordinate Measurement Machine #2, LANL	4,700	5,000	1,600	0
Replacement of Electronic Beam Welder #2, LANL	1,000			
CNC Waist Banding Lathe #1, LANL	1,500	718	0	0
Dimensional Inspection Box, LANL	867	1,333	733	0
Total, Capital Equipment (including MIE)	**106,407**	**95,412**	**84,198**	**78,972**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	2,087	2,133	2,180	2,228
Replace Film Radiography in Finishing Gloveboxes, SRS	3,500	0	0	0
FTS DAS Upgrade Project, SRS	2,000	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**7,587**	**2,133**	**2,180**	**2,228**
Total, Capital Summary	**113,994**	**97,545**	**86,378**	**81,200**

Overview

The Science program provides the expertise and confidence needed to maintain the nuclear stockpile. Over twenty years have passed since the last underground nuclear test. Models of weapon performance, which were originally calibrated to historical nuclear tests, are being replaced with models that are developed and validated with modern scientific approaches. Science-based capabilities now provide the basis for assessments of weapon performance; assure that the nuclear stockpile continues to meet military requirements; and provide a core capability to respond to global nuclear security issues. These Science capabilities enable development and qualification of advanced safety concepts, new materials and manufacturing processes, and reuse, refurbishment or with necessary approvals replacement as part of the Life Extension Programs (LEPs), and assessments of weapon lifetimes.

Science products are used to identify future risks to the performance of the stockpile and inform risk mitigation strategies for major elements of stockpile maintenance and modernization. Key Science products and activities support: (1) annual stockpile assessments; (2) certification statements for LEPs and weapon modifications; (3) prompt resolution of stockpile issues (e.g., Significant Findings Investigations (SFIs), including aging issues); (4) development of certification methodologies for warhead reuse or remanufacturing options for future LEPs; (5) maintenance and exercise of nuclear weapons relevant capabilities through experiments and calculations for the annual assessments; and (6) development and maturation of technologies for the nuclear explosive package. Science products are developed in partnerships with the Advanced Simulation and Computing (ASC), the Inertial Confinement Fusion (ICF) Ignition and High Yield, the Engineering, and Directed Stockpile Work (DSW) programs.

One of the Science's major integrating efforts focuses on developing predictive capabilities for calculating the performance of weapons. One grand challenge is to understand and provide models for primary boost. By contributing to the National Boost Initiative, the Science program is making significant advances in understanding this phenomenon from the initial conditions required for boost to its subsequent dynamics and role in producing the primary yield of stockpile weapons. A second grand challenge is associated with the complex processes occurring during the operation of the secondary. Activities supporting improved models of primary and secondary performance span a range that includes experiments to measure the properties of materials, hydrodynamic experiments, subcritical experiments that probe properties of plutonium in extreme conditions, and high energy density (HED) experiments at ICF facilities that study material in regimes that could otherwise only be examined in nuclear explosions. Predictive science-based models for primary and secondary performance enable maintenance of the stockpile as weapons evolve from the configurations designed during the era of underground testing. In addition, these capabilities support the U.S. Intelligence Community's assessments of foreign state weapon activities.

Subprograms of the Science program also contribute to the development of the future national laboratory workforce through the Stewardship Science Academic Alliances (SSAA). SSAA funds university research in unique scientific fields relevant to stockpile stewardship that are not funded elsewhere by the government or private industry. These include: materials under dynamic conditions and in extreme environments; hydrodynamics; low-energy nuclear science and radiochemistry; and high energy density science.

Highlights of the FY 2016 Budget Request

The Science program provides technical expertise and experimental capabilities needed to assess and provide LEP options incorporating the reuse of pits and other components within the nuclear explosives package; provides improved diagnostic capabilities for experiments at U1a in Nevada; and enables improved surety technologies in future LEPs. Many of these efforts contribute to a major level 1 milestone in FY 2016. This milestone will document the development of design options/enabling capabilities for stockpile maintenance of secondaries.

The Science Program's FY 2016 budget request is $389,614,000, or $22,477,000 (-5.5%) below the FY 2015 enacted level.

The readiness level of multi-point safety options will progress in the *Advanced Certification* program in FY 2016. In *Primary Assessment Technologies*, the Capabilities for Nuclear Intelligence efforts will remain level because existing resources are needed for designing and analyzing the hydrodynamic and subcritical experiments required to develop the tools and methodology for physics performance that underpin the certification of the LEPs. In *Dynamic Materials Properties*, where

the design, development, and execution of subcritical experiments occur, the program will move to a bi-laboratory effort at U1a; also, the request includes efforts at LANSCE in support of Stockpile Stewardship. Efforts in *Advanced Radiography* will continue at the FY 2015 level in order for the Science program to support an FY 2020 initial operational capability for an advanced diagnostic capability at U1a. Resources are requested in FY 2016 for preparation work in anticipation of the future construction project at U1a. Work in FY 2016 will facilitate the installation of the Major Items of Equipment (MIE), Advanced Sources and Detectors, and will continue the developmental work leading to maturation and down-select of specific components and technologies for use in the future diagnostic system to be fielded in 2020. In *Secondary Assessment Technologies,* a major milestone for documenting the development of design options/enabling capabilities for stockpile evolution of secondaries is planned in FY 2016.

Major Outyear Priorities and Assumptions

Outyear funding levels for the Science program total $1,925,335,000 for FY 2017 through FY 2020. Major outyear priorities include science support for LEP schedules through 2030 (as approved by the Nuclear Weapons Council); developing the next-generation science and engineering workforce required to achieve future nuclear security objectives as described in the Nuclear Posture Review; annual assessment of the stockpile; and development of capabilities needed for resolution of significant findings discovered through stockpile surveillance. Science activities in support of these priorities include: establishing a sustainable dynamic plutonium experimental capability at the Nevada National Security Site (NNSS) to address potential reuse options and qualifying remanufacturing processes; execution of hydrodynamic experiments supporting advanced certification objectives in safety and security enhancing the metallurgical understanding of the effects of plutonium aging and options for modern manufacturing processes; execution of simulations and experiments to inform the development of design options/enabling capabilities for secondaries; experiments for the assessment of manufacturing options for other nuclear explosive package components; and predictive capabilities to support assessments of foreign state nuclear weapon activities. A principal assumption is that funding for the programs will be sufficient to meet these priorities. In addition, Science planning relies on availability of resources in ASC, Engineering, the ICF, and DSW (especially the plutonium sustainment program), and adequate maintenance of the facilities and infrastructure of the nuclear weapons complex.

Science
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Science					
Advanced Certification	58,747	58,631	58,747	50,714	-8,033
Primary Assessment Technologies	92,000	91,682	109,000	98,500	-10,500
Dynamic Materials Properties	104,000	103,696	109,000	109,000	0
Advanced Radiography	29,509	29,438	47,000	47,000	0
Secondary Assessment Technologies	85,467	85,167	88,344	84,400	-3,944
Total, Science	**369,723**	**368,614**	**412,091**	**389,614**	**-22,477**

Outyears for Science
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Science				
Advanced Certification	54,943	59,339	64,085	69,212
Primary Assessment Technologies	104,760	113,141	122,192	126,967
Dynamic Materials Properties	129,840	130,000	140,000	140,000
Advanced Radiography	55,762	91,442	77,912	78,480
Secondary Assessment Technologies	91,260	92,000	92,000	92,000
Total, Science	**436,565**	**485,922**	**496,189**	**506,659**

Science
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Advanced Certification: Decrease reflects planned transition of effort to the LEPs.	**-8,033**
Primary Assessment Technologies: Decrease reflects: (1) the completion of the Level 1 pit reuse milestone in FY 2015; and (2) no planned growth in the development of Capabilities for Nuclear Intelligence.	**-10,500**
Dynamic Materials Properties: No change.	**0**
Advanced Radiography: No change.	**0**
Secondary Assessment Technologies: Maintains investment in the science underpinning the stockpile including a major 2016 milestone on secondary capabilities and design options, but defers planned growth to weapons outputs and environments and efforts in energy balance.	**-3,944**
Total, Science	**-22,477**

Description

Advanced Certification is focused on enabling certification of an evolving stockpile in the absence of nuclear testing, carried out in part by integrating advances across the supporting science. This subprogram develops tools and methods that support assessment activities associated with the current stockpile as well as certification of future stockpile options for new safety and security features. Advanced Certification, therefore, provides a strong focal point for key science, technology, and engineering deliverables that enable future life extension certification activities. The subprogram integrates scientific and technological advances that are supported elsewhere in Stockpile Stewardship (Science, ASC, and ICF) with input from continuing studies in order to: understand impacts of aging phenomena and design options on weapon performance; enhance the weapons certification process; refine computational tools and methods; advance the physical understanding of surety mechanisms; understand failure modes; assess new manufacturing processes; and provide rapid response to emerging stockpile needs.

FY 2017-FY 2020 Key Milestones

- Develop approaches to qualify primary initiation detonator systems.
- Develop, characterize, and test prototype Nuclear Explosive Package (NEP) components made using additive manufacturing method, including NEP structural components, primary polymeric components, Canned Subassembly components, and radiation case components.
- Assess qualification path of new Y-12 manufacturing process for component in support of future stockpile work.
- Perform integral hydrodynamic tests to assess options for improvement of surety design in LEPs, validate the Scaling and Surrogacy methodology, and study characteristics of historical primary anomalies.
- Design and support HED experiments to support primary and secondary performance related to assessment and certification activities of upcoming LEPs.
- Conduct focused experiments in support of development and maturation of product-based certification methodology.
- Provide capabilities for product-based certification that enable qualification of components made with advanced manufacturing.
- Conduct assessments of comparable nuclear tests, studies of failure modes, and other advanced methodologies to enable their use in certification of upcoming LEPs.
- Continue studies supporting understanding of scaling and surrogacy to support the experimental basis for weapon assessments.
- Conduct experiments and analyses needed to qualify advanced surety technologies for future stockpile application.
- Develop an experimental plan to enable certification of reuse and remanufacturing options for all nuclear components in future LEPs by FY 2016, with the intent to complete the initial set of experiments defined in the plan by FY 2020.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Advanced Certification $58,747,000	**Advanced Certification $50,714,000**	**Advanced Certification -$8,033,000**
• Experimentally explore a surety mechanism for reuse design options. • Continue the use of scaling and surrogate experiments to examine and extend concept of "nearness" in historic underground test data and to support weapon assessment activities. • Demonstrate 3D uncertainty quantification for surety. • Develop plan outlining the path forward to product-based certification in support of more rapid, efficient, and robust LEP, Significant Finding Investigation (SFI) closure, and annual assessment activities. • Continue hydrodynamic experiments required for developing certification of pit reuse options. • Initiate development of emerging technologies, such as additive manufacturing, to meet evolving military requirements. Assess options for replacing key nuclear explosive package structural, primary, and Canned Subassembly (CSA) using modern manufacturing and materials.	• Advance the certification readiness level of various multi-point safe options A, B, and C and initiate feasibility study of application. • Mature surety concepts and mechanism for reuse and remanufacturing design options. • Perform work associated with Scaling and Surrogacy to enhance primary certification methodology. • Implement improvements in QMU metrics into assessment tools. • Develop plan for product-based certification methodologies for components and systems • Execute experiments and complete analyses supporting evaluation of pit reuse designs and assess the preliminary plans in support of reuse that are driving diagnostic investments in the out-years. • Develop certification techniques proposed in the 2015 pegpost. • Increase the certification readiness level of various NEP components, including those made with additive manufacturing. • Continue assessment of certification methodologies for replacing CSA components.	• Reduce work on developing more efficient and accurate Uncertainty Quantification methodologies for use in certifying LEPs.

Description

Primary Assessment Technologies provides capabilities needed for annual assessment of stockpile primaries, design and certification of future Life Extension Programs (LEPs), improvements in primary safety and security, and for resolving Significant Finding Investigations (SFIs). A principal focus of Primary Assessment Technologies for the next five years will be to continue developing predictive capabilities for modeling boost, a process key to proper functioning of the weapon. Another principal focus is on providing the capability to assess impacts of plutonium aging (including corrosion processes) and changes associated with stockpile LEPs, such as reuse of components and the incorporation of safety changes (e.g., use of insensitive high explosives). Primary Assessment Technologies also provides science capabilities needed for Intelligence Community assessments of foreign nuclear weapon activities.

FY 2017-FY 2020 Key Milestones

- Provide capabilities for predicting primary lifetimes that account for initial production defects.
- Conduct HED experiments to measure properties of burning plasmas relevant for weapon operation.
- Continue to provide the ability to resolve Significant Finding Investigations associated with observations made by modern surveillance tools.
- Provide science-basis enabling maturation and certification of future LEP options.
- Develop updated assessment of plutonium aging based on new experimental data.
- Conduct experiments and analyses to resolve principal remaining uncertainties associated with boost. This will enable confident assessment of weapons performance in regimes that differ from those tested either because of aging, changes in manufacturing processes, or changes in design.
- Complete Predictive Capability Framework (PCF) milestone on boost to resolve key uncertainties in stockpile assessment.
- Conduct experiments and analyses to address nuclear physics parameter uncertainties.
- Expand weapon-science capabilities to strengthen Intelligence Community assessments of specific foreign state nuclear weapon activities. Develop modern capabilities for the stockpile stewardship program appropriate and suitable for use by the counter-terrorism and counter-proliferation program mission.
- Develop a comprehensive understanding (e.g., kinetics, surface morphology, etc.) of the corrosion process on actinide materials.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Primary Assessment Technologies $109,000,000	**Primary Assessment Technologies $98,500,000**	**Primary Assessment Technologies -$10,500,000**
• Complete level 1 milestone addressing the capability to reuse pits in future LEPs. • Conduct experiments at ICF facilities to measure properties of materials at extreme conditions and to develop a platform for plutonium. • Assess the impact of specific phenomena on pit lifetimes. • Conduct precision measurements for one aspect of fission properties of plutonium to improve the understanding of weapon criticality. • Develop diagnostics enabling improved experimental measurements of high explosives and implosion systems. • Expand predictive capabilities to broaden the applicability of stockpile tools supporting foreign assessment.	• Complete High Energy Density (HED) experiments providing data on the behavior of materials in extreme regimes relevant for stockpile primaries. • Complete high explosive experiments resolving key boost uncertainties. • Complete precision measurements for one aspect of fission properties of plutonium to improve the understanding of weapon criticality.	• Develop diagnostics, measure properties of plutonium aging, and study the effects of specific LEP changes on the boost process to enable pit reuse options and other technologies in the future stockpile.

Description

Dynamic Materials Properties develops and maintains the experimental capabilities needed to inform modern, physics-based models that describe and predict the behaviors of weapon materials performance in environments of extreme conditions of pressure, temperature, stress, strain, and strain rates relevant to nuclear weapons performance environments. This program provides the experimental data and essential materials knowledge required for annual assessment and certification of the stockpile and to inform potential future LEP options. The materials of interest include plutonium, uranium, high explosives, and other materials used in nuclear weapons. Surrogate materials are used to aid understanding and develop data without the use of Special Nuclear Materials (SNM). They are also used for the development and qualification of advanced diagnostics prior to fielding on more complex and costly experiments on nuclear materials. It is essential to continue to invest in understanding the properties and performance of Insensitive High Explosives (IHE), polymers, and foams to address future design options for LEPs. New experimental capabilities are developed as required to provide the needed data and to support its interpretation. This subprogram is closely coordinated with the other NNSA Science, the ASC, DSW, and the Department of Defense (DoD)-DOE Joint Munitions Program.

Required experiments are conducted at laboratory facilities, including PF-4 at TA-55, the Z-machine, U1a, the Advanced Photon Source (APS), Los Alamos Neutron Science Center (LANSCE), Joint Actinide Shock Physics Experimental Research (JASPER) facility, other gas and powder gun facilities, and small-scale laboratories for testing and characterization. Continued research is essential for assessing the use of insensitive high explosives in current weapons systems that were originally designed to use conventional high explosives. The consideration of pit and secondary component reuse and replacement also requires study prior to qualification and certification. Key materials data on polymers, foams, and other materials will continue to be generated, analyzed and incorporated into models. These molecular materials demonstrate aging degradation and therefore, potential performance changes. Environmental regulations and replacement material availability drive the requirement to evaluate and baseline potential new materials for critical nuclear weapons applications.

Research pursued in the Dynamic Materials Properties is essential for answering questions generated in the annual assessment process, baselining materials properties for the future determination of aging effects, and considering materials replacement and future options for LEPs. Dynamic Materials Properties is one of the two substantial funding sources (along with Research and Development Certification and Safety within DSW) for subcritical and other plutonium experiments. This subprogram includes the major experimental capabilities devoted specifically to obtaining data on plutonium and other weapons materials under extreme conditions. New experimental capabilities are developed as needed to provide the required data for annual assessment and potential future LEP options. In particular, subcritical experiments utilizing radiography, radiometry, holography, and/or Photon Doppler Velocimetry (PDV) diagnostic, heating and cooling capabilities on dynamic testing platforms, high-pressure Z experiments on plutonium and other relevant materials, the development of the Phoenix platform, JASPER, and other experimental platforms are all required in order to enable certification of pit reuse with IHE for upcoming LEPs.

FY 2017-FY 2020 Key Milestones

- Prepare and exercise the JASPER capability at NNSS to deliver high pressure plutonium data.
- Develop advanced platforms for high pressure materials measurements on the Z-machine.
- Support subcritical experiments at NNSS in support of upcoming LEPs.
- Develop and field advanced diagnostics for equation-of-state, strength and damage, and hydrodynamic and subcritical experiments, in particular, Multiplexed Photon Doppler Velocimetry (MPDV) advances and pyrometry.
- In support of LEP options, execute experiments providing key data at small-scale experimental facilities: JASPER, TA-55, LANSCE, the Z machine, HE firing sites, and other small-scale science facilities.
- Support the testing and qualification of uranium, surrogates, high explosives, and other non-nuclear materials for remanufacturing options.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Dynamic Materials Properties $109,000,000	**Dynamic Materials Properties $109,000,000**	**Dynamic Materials Properties $0**
• Develop the aging and process-aware plutonium multi-phase equation-of-state (EOS) and other properties, applying complex loading paths to provide high-priority data identified as required for the National Boost Initiative (NBI). • Acquire uranium and other materials data (as detailed in the classified Primary and Secondary Assessment Plans) at LANSCE, Z, and other laboratory facilities. • Provide the analysis to inform decisions on investment for future experiments (from small-scale to integral) and related activities for the Predictive Capability Framework (PCF). • Measure characteristics of plutonium at high pressures at TA-55, JASPER and the Z facility. • Acquire conventional and insensitive high explosive data in support of reuse options. • Execute small- and intermediate-scale tests in support of upcoming subcritical experiments. • Design and implement experimental capabilities for scaled subcritical experiment evaluating reuse concerns. • Develop advanced diagnostics (heating, pyrometry, holography, MPDV, radiography) in support of small-scale, hydrodynamic, and subcritical experiments. • Provide design criteria and research required for containment systems at U1a and Z.	• Continue acquisition of materials EOS, strength and damage data, applying complex loading, required for primary performance and pit reuse options. • Provide data to develop phase and process-aware materials models to simulate engineering, chemistry, and physics performance in extreme environments • Evaluate insensitive high explosives (IHE) performance and safety in support of reuse options and advanced concepts. • Develop advanced diagnostics for fundamental, hydrodynamic, and subcritical experiments. • Deliver uranium, beryllium, surrogates, and non-nuclear materials data required for stockpile stewardship and Significant Findings Investigation (SFI) closure. • Develop advanced high-pressure capabilities for Pu at Z. • Continue Science experimental research at the LANSCE facility. • Provide the conceptual design and diagnostics definition for future U1a subcritical experiments. • Prepare capabilities for future experiments with plutonium at U1a. • Execute a subcritical experiment for assessment of pit reuse options.	• No change.

Description

Developing predictive capabilities for stockpile stewardship in the absence of nuclear testing relies on the development of advanced platforms and diagnostics to enable and improve the reliable and repeatable measurement of experimental data. This is also true for addressing Significant Finding Investigations (SFIs) and for early technology assessment in the execution of LEPs. Advanced Radiography develops technologies and diagnostics that support experimental activities that are funded primarily within Primary Assessment Technologies, Dynamic Material Properties, Advanced Certification, and DSW. This includes sources, targets, and imaging systems used to diagnose hydrodynamic and subcritical experiments, and the development of platforms and diagnostics for other dynamic material properties experiments, including those that study plutonium properties. These transformational technologies improve the quality and reliability of scientific results at many NNSA experimental facilities at LANL, LLNL, SNL, and NNSS. These include the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility, Flash X-Ray (FXR) radiographic facility, Z pulsed power facility, Cygnus radiological source at the U1a Complex, Proton Radiography (pRad) at the Los Alamos Neutron Science Center (LANSCE), and Radiographic Integrated Test Strand (RITS) with supporting pulsed power machines.

As outlined in the NNSA 2015 Stockpile Stewardship and Management Plan (SSMP), NNSA plans long-term investments supporting plutonium science at NNSS. NNSS is the resource for experiments combining high explosives and plutonium and is recognized as a core capability for NNSA's Stockpile Stewardship Program (SSP) in 50 U.S. Code § 2521.

The SSP is managed by NNSA's Office of Research, Development, Test, and Evaluation, (NA-11), that has the responsibility to assess the effects of aging and manufacturing processes on proposed approaches to stockpile life-extension programs (LEPs), significant finding investigations (SFIs), and other issues that affect the current and future stockpile. To fulfill these responsibilities in the absence of nuclear testing, NA-11 research informs weapons assessment using hydrodynamic experiments with surrogate materials as well as with focused and integral subcritical experiments using plutonium. These experiments, combined with advanced theory, modeling, and simulation tools, underwrite the confidence in our nation's nuclear deterrent in the absence of nuclear testing and are critical as NNSA maintains and modernizes the stockpile.

In 2014, the Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), Sandia National Laboratories, and the NNSS jointly outlined a significant gap in the capabilities available to meet the responsibilities of the SSP. NNSA does not have an integrated facility that is able to measure the final stages of a primary implosion using plutonium. To fill this gap and to better diagnose this relevant regime, NNSA must enhance the capabilities for subcritical experiments at NNSS's underground laboratory, the U1a Complex. These capability enhancements are needed to support the LEP plan documented in the 2015 SSMP. This enhanced capability investment, also known as the Enhanced Capabilities for Subcritical Experiments (ECSE), is required in the FY 2015 through FY 2023 timeframe to meet critical milestones. In FY 2016, $10.5M is requested for Major Items of Equipment (MIE) for the ECSE project for Advanced Sources and Detectors used to diagnose subcritical experiments. A major portion of the total ECSE investment will be completed by FY 2020. The budget estimate ranges between $165 million and $385 million for the FY 2020 deliverables.

FY 2017-FY 2020 Key Milestones

- Complete DARHT Camera Upgrades.
- Complete FXR Injector Replacement.
- Complete major portion of the ECSE at the U1a Complex. (FY 2020).
- Complete pulsed power source development (beyond FY 2020).

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Advanced Radiography $47,000,000	**Advanced Radiography $47,000,000**	**Advanced Radiography $0**
• Continue development and implementation of advanced diagnostic and radiographic technologies supporting modernized surety and pit reuse options for LEPs and the Predictive Capability Framework (PCF) through the National Boost Initiative (NBI). This includes development of a baseline cost and schedule for the first phase of U1a diagnostic capabilities for subcritical experiments. • Continue system improvements to the Z machine to enable a broader range of dynamic materials experiments and radiation environments. • Continue development of next-generation cameras and detectors for DARHT, pRad, Contained Firing Facility (CFF) and U1a consistent with the high-resolution, high-speed imaging systems development strategy.	• Replace the aging DARHT camera system on its scheduled maintenance cycle. • Continue development of enhanced capabilities supporting future phases of deployment in the U1a Complex beyond the FYNSP. • Replace the FXR injector system and accelerator cells on scheduled replacement cycle. • Continue Linear Transformer Driver multi-purpose mission R&D. • Replace detector and scintillator technology at multiple NNSA facilities.	• Implementation of an enhanced radiographic capability at U1a at NNSS that includes an MIE for Advanced Sources and Detectors to diagnose subcritical experiments. In FY 2016, efforts will be focused on the preliminary design and establishing a performance baseline in accordance with DOE Order 413.3B. • Performance Baseline for the enhanced NNSS diagnostic capability and radiographic technologies in support of modernized surety and pit reuse options for LEPs and the PCF. • Development of pulsed power sources.

Description

Secondary Assessment Technologies provides capabilities that increase confidence in the assessment of stockpile secondaries, enabling a broad range of LEPs options and resolution of SFIs. A principal focus of Secondary Assessment Technologies is to provide the scientific base used to quantify full system performance margins and associated uncertainties. For stockpile systems, this assessment enables: (1) the acceptance of existing secondaries and other nuclear explosive package components for future LEP options; and (2) the development of the qualification methodology for physics performance of remanufactured canned subassembly components. Another focus is development of predictive capabilities to quantify weapon outputs and interaction with the environment for both stockpile systems and non-stockpile systems that are relevant to national security. Secondary Assessment Technologies has strong programmatic coupling with other subprograms within Science and the High Energy Density (HED) facilities supported by both the Science and Inertial Confinement Fusion (ICF) Ignition and High Yield programs, including the National Ignition Facility (NIF), Omega Laser Facility at the University of Rochester, and the Z Machine at Sandia National Laboratories (SNL), and significant coupling to advanced computing platforms supported by the ASC Program.

Three major deliverables are expected over the next five years. First, the completion of significant efforts in "energy balance" is a near term focus of direct relevance to all LEPs. Second, Secondary Assessment Technologies is delivering a new FY 2016 level 1 milestone as a major advance in predictive capabilities that impact decisions for the future LEP options. Third, development of improved predictive capabilities for secondary performance (level 1 milestone in FY 2019), especially those that are dependent on advanced experimental platforms being developed in conjunction with the ICF program.

FY 2017-FY 2020 Key Milestones

- Explore design options identified in the "Secondary LEP Capability" Predictive Capability Framework (PCF) pegpost for FY 2016.
- Document an informational, modeling, and experimental gap analysis of ultraviolet/visible/infrared (UV/VIS/IR) in order to incorporate into output calculations.
- Develop a warm x-ray source to support future weapons qualifications.
- Develop strategic plan and execute program plan to deliver full system output modeling capabilities that includes experimental platform development.
- Continue to recruit, develop, and retain stockpile stewards, maintaining the technical superiority in the nation's nuclear security interest.
- Execute program plans associated with secondary capabilities and design options consistent with the LEP schedule.
- Develop and execute plans for 2019 Secondary Performance pegpost, delivering an advanced predictive capability for secondary performance in nominal and off nominal conditions.
- Develop physics-based models for key secondary-relevant issues that include SFI's, LEPS and the Annual Assessment Report; and validate through HED and other experimental efforts and platform development to obtain necessary experimental data.
- Calculate and compile all Bluebook output data in the eBluebook and calculate the Historical outputs based on UGTs and compare against historical measurements.
- Incorporate a validated and verified calculation of the UV/VIS/IR output with certain models.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Secondary Assessment Technologies $88,344,000	**Secondary Assessment Technologies $84,400,000**	**Secondary Assessment Technologies -$3,944,000**
• Complete delivery of "Energy Balance" predictive capabilities. • Execute program plan for achieving the "Secondary LEP" and "Secondary Performance" PCF pegposts in FY 2016 and FY 2019, respectively. • Develop prioritized HED platforms and execute stockpile stewardship-relevant HED experiments on NIF, Omega, and Z. • Deliver initial validation data from NIF on key secondary performance models of relevance to the FY 2019 Secondary Performance milestone. • Implement the capability-based radiation effects science mission into the PCF. • Enable transition of HED calibration efforts onto SSRL. • Explore the current capabilities and needs for a combined experimentally informed modeling effort to incorporate UV/VIS/IR into outputs. • Deliver relevant Bluebook output data along with Historical outputs based on UGTs. • Continue development of warm x-ray sources.	• Complete the "Secondary LEP Capability" Predictive Capability Framework (PCF) pegpost for FY 2016, delivering design options and enabling capabilities for stockpile evolution of secondaries. • Develop strategic plan and execute program plan to deliver full system output modeling capabilities that includes experimental platform development. • Continue to recruit, develop, and retain stockpile stewards, maintaining the technical superiority in the nation's nuclear security interest. • Execute program plans associated with secondary capabilities and design options consistent with the LEP schedule. • Develop and execute plans for 2019 Secondary Performance pegpost, delivering an advanced predictive capability for secondary performance in nominal and off nominal conditions. • Develop physics-based models for key secondary-relevant issues that include SFI's, LEPS and the Annual Assessment Report; and validate through HED and other experimental efforts and platform development to obtain necessary experimental data. • Complete the transition to SSRL from Brookhaven National Laboratory for an HED diagnostic calibration capability. • Establish a formal plan to incorporate UV/VIS/IR into output codes • Deliver further Bluebook output data and Historical outputs based on UGTs. • Continue development of warm x-ray sources.	• The "Energy Balance" milestone is to be achieved in FY 2015; ramp down of this activity is compensated for by ramp up of the "Secondary LEP Capability" Level 1 milestone. • The radiation effects science mission identified in the FY 2015 Request is an activity that needs the system output modeling capabilities; this will not be a growth area item in the Science program in FY 2016. • Progress is being made in the transition of HED calibration capabilities for HED experimental diagnostics to SSRL. FY 2015 activities are to develop the SSRL-based capability all year, and FY 2016 activities are to finish the development and begin initial operations. • Initial work begins into the UV/VIS/IR outputs. • Increase work on providing Bluebook output data to support weapon survivability calculations and qualifications.

Science Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Experimentally Validated Physics Models - Cumulative percentage of progress in delivering an experimentally validated physics-based capability to enable assessment of weapon performance with quantified uncertainties, replacing key empirical parameters in the nuclear explosive package.							
Target	76 % of progress	80 % of progress	84 % of progress	88 % of progress	92 % of progress	96 % of progress	100% of progress
Result	76						
Endpoint Target	By the end of FY 2020, use modern physics models in assessment calculations to replace the major empirical parameters affecting weapon performance. This activity is performed in collaboration with the ICF.						

Science
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	227,511	33,090	3,672	3,672	14,040	13,709	-331
Plant Projects (GPP) (<$10M)	0	0	0	0	0	0	0
Total, Capital Operating Expenses	**227,511**	**33,090**	**3,672**	**3,672**	**14,040**	**13,709**	**-331**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	38,797	29,376	3,072	3,072	3,140	3,209	+69
Advanced Sources and Detectors, NNSS	184,000	0	0	0	10,500	10,500	0
TA-53 pRad, LANL	4,714	3,714	600	600	400	0	-400
Total, Capital Equipment (including MIE)	**227,511**	**33,090**	**3,672**	**3,672**	**14,040**	**13,709**	**-331**

Outyears for Science

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	22,280	62,352	48,246	48,501
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**22,280**	**62,352**	**48,246**	**48,501**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	3,280	3,352	3,246	3,501
Advanced Sources and Detectors, NNSS	19,000	59,000	45,000	45,000
Total, Capital Equipment (including MIE)	**22,280**	**62,352**	**48,246**	**48,501**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**22,280**	**62,352**	**48,246**	**48,501**

Engineering

Overview

The Engineering program creates and matures advanced tools and capabilities necessary to maintain a safe, secure, and effective nuclear weapons stockpile and to enhance nuclear weapon safety, use-control/denial, and security. Primary responsibilities of this program include:

- Maturing technological enhancements vital to maintaining the current stockpile and life extension needs.
- Providing fundamental, sustained research and development on the engineering basis for stockpile assessment and certification throughout the entire lifecycle of each weapon.
- Assessing and improving fielded nuclear and non-nuclear components without resorting to underground testing.
- Increasing the ability to predict the response of weapon components and subsystems to aging and to abnormal and hostile as well as normal environments.
- Further advancing components and materials testing to minimize or avoid destructive testing while ensuring high-level weapon reliability and certification.

The Engineering program directly supports three key missions discussed in the 2010 *Nuclear Posture Review Report:* strengthening the science, technology, and engineering (ST&E) base by maturing advanced technologies to improve weapon surety; providing the tools for qualifying weapon components and certifying weapons without underground testing; and supporting annual stockpile assessments through improved weapons surveillance technologies and warhead component aging assessments. In doing so, the Engineering program contributes to the Administrator's goal of maintaining a core scientific, technical and engineering capability that supports the Nation's nuclear security enterprise.

The Engineering program funds four subprograms; Enhanced Surety, Weapons Systems Engineering Assessment Technology, Nuclear Survivability, and Enhanced Surveillance. Examples of subprogram activities include:

- Deploying a formal process to mature improved safety and security technologies using the Technical Basis for Stockpile Transformation Planning (TBSTP) (Enhanced Surety)
- Demonstrating three-dimensional kinematic measurements on a weapon component in a shock or vibration environment with uncertainty assessment (Weapons Systems Engineering Assessment Technology)
- Demonstrating a model-based qualification of silicon electronics for weapon use in hostile environments and demonstrating maturity of compound semiconductor electronics to sustain the stockpile (Nuclear Survivability)
- Completing the transformation of weapons stockpile surveillance to enable detection of initial design and production defects for life-extended weapons, materials aging defects, and predictive performance trends for the enduring stockpile (Enhanced Surveillance).

In developing technologies for Life Extension Programs (LEPs), such as those mentioned above, the program employs a first user LEP model and also provides for adaptation of these technologies for application to subsequent LEPs, or more limited component upgrades. A first user LEP refers to the first LEP to use a technology or component that was developed or is being developed for multi-weapon-type use. The first user LEP will then assume the costs (e.g., the B-61) for subsequent maturation of the technology for its particular requirements.

The Department's Engineering program FY 2016 Request for $131,377,000 is a decrease of $4,628,000 (-3.4%) from the FY 2015 enacted level of $136,005,000.

Highlights of the FY 2016 Budget Request

- Shift of priority emphasis to the immediate needs of the Directed Stockpile Work Program.
- Release validation data on required weapon systems internal and external intrinsic radiation environments.
- Complete radiation effects environmental testing for the B61-12.
- Deliver cavity System Generated Electro-Magnetic Pulse (SGEMP) validation data to probe peak-pressure response for a 3D test cavity relevant to future LEP studies.

FY 2014 Accomplishments

Enhanced Surety

- Joint Integrated Lifecycle Surety (JILS) successfully transitioned to implementation status.
- Advanced generation stronglink matured to Technology Readiness Level 5, exceeding expectations for both functional and environmental testing, and decision made for further development.

Weapons System Engineering Assessment Technology (WSEAT):

- Completed Thermal test and evaluation of Insensitive High Explosive IHE unit completed. (LANL)
- Completed Insensitive High Explosive Assembly Stress State Characterization (iHATCH) Phase 2 Build 2: Test assembly fabrication and instrumentation with Insensitive High Explosive (IHE) (LANL)
- Continued to conduct Thermal and Mechanical Experiments on Insensitive High Explosive (IHE) materials and Cellular Silicone Foams in support of constitutive model development in support of the W78/88-1 LEP, LRSO, W87, B83, W80 and W84 programs. (LLNL)
- Conducted IHE testing focused on understanding cyclic failure in stockpile environment. (LLNL)
- Developed advance engineering assessment capabilities so that weapon performance in complete and realistic environments can be done with fidelity and accuracy. (SNL)
- Completed experimental datasets for system and component performance for code validation and margin assessment in thermal, aerodynamic, structural and electromagnetic environments. (SNL)
- Produced experimental data that enables decision making about system performance and vulnerability in normal/abnormal, aero, structural and electromagnetic environments. (SNL)

Nuclear Survivability:

- Evaluated several modeling techniques toward hostile environment assessment methodology modernization with ASC codes. (LANL)
- Continued supporting code development in order to get capability needed for nuclear survivability analysis. (LLNL)
- Performed box internal electromagnetic pulse (IEMP) simulation fidelity experiments at Saturn in support of the W88 Alt 370. (SNL)
- Provided validation data for III-V device and circuit models and physics discovery data for construction of an atomistic neutron-damaged device model. (SNL)

Enhanced Surveillance:

- Evaluated new polymer formulations and production processes for the interoperable warhead (IW-1). (KCP, LLNL)
- Completed Phase I B61-3/4/10 Qualification Evaluation Review (QER) for new system tester at the Weapon Evaluation Test Laboratory (WETL). (SNL)
- Implemented Ultrasonic Tester (UT) diagnostic tool for W76-1 LEP surveillance. (SRNL)
- Completed aging studies and lifetime estimates for non-nuclear component and non-nuclear material for the B61-12 LEP and W88 Alt 370. (LANL, SNL)
- Developed Canned Subassembly (CSA) response model in support of future LEPs. (LANL, Y-12)
- Continued accelerated aging studies of polymers and reuse components for LEPs. (LLNL)

Major Outyear Priorities and Assumptions

Outyear funding levels for the Engineering program total $541,333,000 for FY 2017 through FY 2020 and reflect programmatic requirements of the nuclear weapons stockpile, in particular the specific experiments and tests and maturation of components that support the B61 LEP and other possible future LEPs. The Engineering program priorities reflect continued efforts to assess and improve the safety, security, reliability, and performance of the nuclear weapons stockpile.

This involves:

- developing and maturing improved and viable technologies for both near and long terms insertion options to improve nuclear weapon safety, security, and use control through the use of the Joint Lifecycle Surety tool and the TBSTP;
- providing scientific understanding, computational, and experimental capability to develop and validate computational models and qualify weapon systems in normal and abnormal environments;

- providing the tools and technologies needed to design and qualify components and subsystems to meet requirements for hostile environments; and
- maturing select predictive aging models and lifetime assessments.

Engineering
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Engineering					
Enhanced Surety	51,771	51,711	52,003	50,821	-1,182
Weapon Systems Engineering Assessment Technology	23,727	23,709	20,832	17,371	-3,461
Nuclear Survivability	19,504	19,483	25,371	24,461	-910
Enhanced Surveillance	54,909	54,695	37,799	38,724	+925
Total, Engineering	**149,911**	**149,598**	**136,005**	**131,377**	**-4,628**

Outyears for Engineering
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Engineering				
Enhanced Surety	37,196	44,412	45,757	44,072
Weapon Systems Engineering Assessment Technology	15,958	22,009	20,731	21,153
Nuclear Survivability	26,105	28,170	29,155	29,949
Enhanced Surveillance	41,228	44,127	45,186	46,125
Total, Engineering	**120,487**	**138,718**	**140,829**	**141,299**

Engineering
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Enhanced Surety: This decrease reflects a reduction to the continued evaluation of stockpile safety, security, and use control improvement options, using the Joint Integrated Lifecycle Surety baseline data and assessment tool suite, and the maturation of technologies for Air Force and Navy ballistic missile warheads.	**-1,182**
Weapon Systems Engineering Assessment Technology: The decrease reflects a reduction of validation-related testing required for future refurbishments made possible by the delay of the W78/88-1 refurbishment.	**-3,461**
Nuclear Survivability: This decrease reflects reduced W80-4 (Long Range Stand Off (LRSO)) support in modeling and experimentation of System Generated Electromagnetic Pulse (SGEMP) in cavities and cables; cold and warm x-ray experimental platforms; and outputs modeling (Redbook and Bluebook). This decrease also reflects reduced international efforts through the Weapons Effects Strategic Collaboration (WESC). These reductions reflect NNSA planning decisions and balance risk with available resources.	**-910**
Enhanced Surveillance: The increase sustains capabilities that will continue support of ongoing multi-year aging studies, predictive modeling efforts, required deliverables for the B61-12 LEP and W88 Alt 370, and development of targeted non-destructive evaluation testing/diagnostics. Planned pursuit of additional advanced diagnostics (e.g., neutron imaging) for the legacy as well as future stockpile and new additive manufacturing initiatives are no longer within the scope of the planned Enhanced Surveillance subprogram based on current FYNSP projections.	**+925**
Total, Engineering	**-4,628**

Engineering
Enhanced Surety

Description

The Enhanced Surety subprogram supports President Obama's vision[a] that "*We must ensure that terrorists never acquire a nuclear weapon. This is the most immediate and extreme threat to global security."* Enhanced Surety is dedicated to simultaneously minimizing the probability of unauthorized use and maximizing the reliability of authorized use of a U.S. nuclear weapon while maintaining maximum safety. Enhanced Surety creates, develops, and matures advanced safety, security, and use-control/denial technologies, to minimize the probability of an accidental nuclear explosion and, in the unlikely event that security fails and unauthorized access is gained, reduce the risk of an unauthorized nuclear yield to the lowest possible level.

Enhanced Surety seeks advances in leading-edge technology in the foregoing areas, within two time-frames of approximately equal significance:

- Maturing near-term surety concepts and technologies to offer the most effective surety solutions achievable within the time-lines of known LEPs or other improvements in weapon functionality.
- Continuously creating and evolving highly advanced surety technologies, independent of specific weapon types or specific insertion opportunities. In light of the long lead-times such quantum-jump technologies generally entail, this proactive approach maximizes the probability that, by the time a future insertion opportunity emerges, major surety enhancements will be ready to meet it.

Enhanced Surety uses the TBSTP that incorporates National Security Presidential Directive -28 (June 30, 2003) requirements and other NNSA Surety memos in conjunction with the Joint Integrated Lifecycle Surety (JILS) risk assessment capability to identify the most cost-effective surety technologies, allowing program and weapon system managers to make better-informed implementation decisions on stockpile surety improvement options.

Enhanced Surety activities include:

(1) Advanced Safety – Minimizes the probability of accidental nuclear yield or dispersion of fissile material. Develops improved control over warhead initiation including improved stronglinks, weaklinks, firing systems, and high explosive initiation systems, in order to provide greater nuclear weapon safety.

(2) Advanced Use Control/Denial– Creates and matures options, internal and/or external to the warhead, to minimize the potential for deliberate unauthorized use of a U.S. nuclear weapon.

(3) Integrated Surety Solutions (ISS)– Develops and demonstrates both system concepts and associated enabling technologies that could integrate weapon capabilities with physical security in order to identify cost-effective stockpile surety enhancements.

FY 2017-FY 2020 Key Milestones

- Mature Multi-Point safety (MPS) options.
- Complete the transition of the advanced stronglink from the Enhanced Surety subprogram to DSW.
- Demonstrate the highest priority device by testing and evaluation and mature its technology through TRL-5
- Test, evaluate, and further mature technologies for multi-venue ISS implementation for Air Force systems.
- Improve understanding of material compatibilities

[a] President Barack Obama Speech in Prague, Czech Republic, April 5, 2009.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Enhanced Surety $52,003,000	**Enhanced Surety $50,821,000**	**Enhanced Surety -$1,182,000**
• Continue to apply the JILS tool to DOE and DoD venues. • Perform material compatibility and parametric studies on Multi-Point Safety (MPS) options. • Continue maturation, testing, and evaluation of the next generation highest priority device. • Test and evaluate technologies for multi-venue ISS implementation for Air Force systems.	• Perform material compatibility and parametric studies on Multi-Point Safety (MPS) options • Continue maturation, testing, and evaluation of the next generation highest priority device • Test and evaluate technologies for multi-venue ISS implementation for Air Force systems.	• The decrease will reduce enhancements to the stockpile for risk areas identified by the Joint Integrated Lifecycle Surety (JILS) tool used for the evaluation of stockpile safety, security, and use-control. This reduction will reduce the usefulness of the JILS baseline data and the assessment tool suite for the Integrated Surety Solutions maturation process.

Description

The Weapon Systems Engineering Assessment Technology (WSEAT) subprogram improves the physical understanding of weapon system and weapon component responses to environments. This includes all relevant stockpile-to-target sequence (STS) and manufacturing support service environments except nuclear and hostile electromagnetic environments which are explored in the Nuclear Survivability subprogram of the Engineering program. The WSEAT subprogram supports activities from foundational discovery through highly complex experimentation and analysis, with the goal of maturing technology, methodology, and analysis tools to the point where they can be deployed for direct impact to DSW. This subprogram focuses its resources on the immediate needs of DSW and ASC customers (e.g., current Alts and Mods; stockpile assessments; and open significant finding investigations (SFIs).

Weapon Systems Engineering Assessment Technology activities include:

(1) Methodology Needs and Engineering Research – Supports engineering research and the development of advanced diagnostics to acquire physics-based engineering data. In addition, this element supports the development of a methodology that integrates experimental capability development with modeling and simulation within an engineering-focused Quantification of Margins and Uncertainties (QMU) framework to support the stockpile LEP qualification activities.

(2) Experimental Validation – Develops experimental techniques and provides high fidelity, appropriately scaled, robust experimental data to validate models for predicting weapon performance and safety with quantified margins and uncertainties. Further, it develops test methodologies and deploys diagnostics in ground-based simulations of flight environments that enable the quantification of weapon responses to realistic environments in support of complex transformation, weapon qualification testing, and surveillance.

FY 2017-FY 2020 Key Milestones

- Continue to validate test capability and instrumentation to quantify weather effect on re-entry body/re-entry vehicle (RB/RV) flight bodies using ground test facilities.
- Continue to develop a RB/RV system-scale multi-axis hybrid shaker test capability for shock and vibration testing of RB/RV and for contact fuze performance qualification margins.
- Continue to characterize Lightning Arrestor Connector (LAC) response to lightning for LAC qualification and predictive performance.
- Continue to validate capability for stress state characterization of high explosive systems for all STS environments.
- Continue to incorporate insensitive high explosive failure into material models.
- Continue development of polymer material models that incorporate failure mechanisms.
- Continue to quantify uncertainties and assess margins for a reentry system primary in normal and abnormal environments.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Weapon Systems Engineering Assessment Technology $20,832,000	**Weapon Systems Engineering Assessment Technology $17,371,000**	**Weapon Systems Engineering Assessment Technology -$3,461,000**
• Validate test capability and instrumentation to quantify weather effect on re-entry body/re-entry vehicle (RB/RV) flight bodies using ground test facilities. • Develop a RB/RV system-scale multi-axis hybrid shaker test capability for shock and vibration testing of RB/RV and for contact fuze performance qualification margins. • Characterize Lightning Arrestor Connector (LAC) response to lightning for LAC qualification and predictive performance. • Validate capability for stress state characterization of high explosive systems for all STS environments. • Incorporate insensitive high explosive failure into material models. • Begin development of polymer material models that incorporate failure mechanisms. • Quantify uncertainties and assess margins for a reentry system primary in normal environments.	• Continue to validate test capability and instrumentation to quantify weather effect on re-entry body/re-entry vehicle (RB/RV) flight bodies using ground test facilities. • Continue to develop a RB/RV system-scale multi-axis hybrid shaker test capability for shock and vibration testing of RB/RV and for contact fuze performance qualification margins. • Continue to characterize Lightning Arrestor Connector (LAC) response to lightning for LAC qualification and predictive performance. • Continue to validate capability for stress state characterization of high explosive systems for all STS environments. • Continue to incorporate insensitive high explosive failure into material models. • Continue development of polymer material models that incorporate failure mechanisms. • Continue to quantify uncertainties and assess margins for a reentry system primary in normal and abnormal environments.	• The decrease reflects a reduction in validation-related testing required for future refurbishments due to the refurbishments (W78/88-1) being delayed.

Description

The modern analysis capabilities developed by the Nuclear Survivability (NS) subprogram will enable quicker and more accurate assessment of the potential impacts to warhead nuclear survivability from refurbishments; surveillance discoveries; natural aging; and the introduction of new materials, technologies, or component designs. The scope of the subprogram includes developing scientific and engineering models for understanding radiation effects; improving laboratory radiation sources and diagnostics to support code validation and hardware qualification experiments; generating experimental data to validate scientific and engineering models; understanding radiation-hardened design strategies; and evaluating candidate and evolving stockpile technologies for radiation hardness capabilities in a generalized, weapon-relevant configuration.

Nuclear Survivability activities include:

(1) Vulnerability and Hardening of Nuclear Components – Provide nuclear warhead output and environment capabilities in support of the enduring and evolving stockpile and assure the effectiveness of the methods and tools used to determine survivability.

(2) Nuclear Survivability of Nuclear Components – Develop and validate modeling and experimental nuclear survivability assessment tools for nuclear components.

(3) Radiation Effects Science for Qualification to X-Ray Effects without the use of High Fidelity Testing Capabilities – Assure that critical Stockpile-to-Target-Sequence (STS) requirements for x-ray effects can be met in the wake of the moratorium on underground testing.

(4) Radiation Effects Science Advancement for Stockpile Qualification without the use of Highly Enriched Uranium – Creates new approaches, technologies and infrastructure for qualification of microelectronics, microsystems, and other non-nuclear components to combined fast neutron and gamma effects without the use of test sources requiring highly enriched uranium (HEU).

(5) Design and Qualification Tools Transformation and Technologies for System Survivability – Assure critical STS requirements are met with adequate confidence and cost-effectiveness.

FY 2017-FY 2020 Key Milestones

- Release validation data on required weapon systems internal and external InRad environments.
- Complete delivery of validation of qualification-level device and circuit models for silicon transistor technology.
- Deliver validation data for qualification-level device and circuit models for compound semiconductor HBTs and circuits with Uncertainty Quantification.
- Scalable total ionizing dose hardening techniques and evaluation of dose-rate upset in 180-nm Silicon on Insulator transistor technologies.
- Acquire Single Event Effects data on relevant advanced technologies.
- Collect experimental model validation data for opto-electronic technologies and deliver validation data for electro-optic device response models.
- Deliver radiation induced conductivity data on dielectrics in advanced electronics in support of model development.
- Deliver validation data on Internal EMP for simplified three dimensional (3D) tests of boxed electronics.
- Complete radiation effects environmental testing for the B61-12.
- Update eRedbook with added suite of threat models relevant to the W78/88.
- Deliver cavity SGEMP validation data to probe peak-pressure response for a 3D test cavity relevant to future LEP studies.
- Evaluate impulse models for composite materials and plan experiments to fill in data gaps to deliver validation data for impulse generation models relevant to future LEP studies.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Survivability $25,371,000	**Nuclear Survivability $24,461,000**	**Nuclear Survivability -$910,000**
• Complete validation, through the Qualification Alternatives to the Sandia Pulsed Reactor (QASPR) program, of the qualification methodology for compound semiconductor Heterojunction Bipolar Transistor (HBT) technology. • Characterize and validate the second and third high-fidelity sources to investigate intrinsic radiation effects at STS conditions. • Deliver validation data for Enhanced Low Dose Rate Sensitivity (ELDRS) scientific models. • Implement robust and reliable transfer of energy-deposition data from radiation transport codes to structural and mechanical codes for thermo-mechanical shock and thermo-structural shock. • Deliver scalable hardening techniques for Total Ionizing Dose (TID) for 180-nanometer (nm) Complementary Metal–Oxide–Semiconductor technologies. • Deliver validation data for scientific models for radiation effects in electro-optical device technologies. • Demonstrate maturity of compound semiconductor electronics. • Conduct radiation effects environmental testing for the B61-12. • Deliver data to validate models for System-Generated Electro-Magnetic Pulse (SGEMP) relevant to future LEP studies. • Deliver validation data for impulse generation models relevant to future LEP studies.	• Deliver validation data for qualification-level device and circuit models for compound semiconductor HBTs and circuits with Uncertainty Quantification. • Begin modeling and validation of silicon transistor devices. Release validation data on required weapon systems internal and external intrinsic radiation (InRad) environments. • Acquire Single Event Effects (SEE) data on relevant advanced technologies. • Deliver validation data on internal electromagnetic pulse (EMP) for simplified three dimensional (3D) tests of boxed electronics. Scalable TID hardening techniques and evaluation of dose-rate upset in 180-nm Silicon on Insulator transistor technologies. • Collect experimental model validation data for opto-electronic technologies and deliver validation data for electro-optic device response models. • Deliver radiation induced conductivity data on dielectrics in advanced electronics in support of model development. • Complete radiation effects environmental testing for the B61-12. • Deliver cavity SGEMP validation data to probe peak-pressure response for a 3D test cavity relevant to future LEP studies. • Evaluate impulse models for composite materials and plan experiments to fill in data gaps to deliver validation data for impulse generation models relevant to future LEP studies.	• This decrease reflected reduced W80-4 (LRSO) support of modeling and experimentation of System Generated Electromagnetic Pulse (SGEMP) in cavities and cables, cold and warm x-ray experimental platforms, and outputs modeling (Redbook and Bluebook). The decrease also reflects reductions in international efforts through the Weapons Effects Strategic Collaboration (WESC).

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	• Update electronic (e)Redbook) with added suite of threat models relevant to future LEP studies.	

Description

The Enhanced Surveillance (ES) subprogram contributes to weapon safety, performance and reliability by providing tools needed to predict or detect the precursors of age-related defects and to provide engineering and physics-based estimates of component or system lifetimes. The ES tools consist of science-based models of material, component, and subsystem aging phenomena and advanced diagnostic techniques that provide data needed to validate these models. The effects of aging phenomena that could result in changes in weapon performance, safety, or reliability with respect to their requirements [as specified in their respective military characteristics (MCs), stockpile-to-target sequences (STSs), and interface control documents (ICDs)] are subjected to rigorous assessments by the responsible engineering and physics communities, and are reported annually. The lifetime predictions inform the annual stockpile assessment process with respect to the expected future state of each weapon system and, therefore, serve as inputs to the decision making process for scheduling weapon replacements or refurbishments. Additionally, ES develops tools and diagnostics that allow the examination of key pit features and early detection of defects as well as the assessment of aging effects and signatures.

Enhanced Surveillance activities include:

(1) Pits – Develop and deliver new analytical methods, tools, modeling, and diagnostics, including non-destructive evaluation techniques, to achieve timely, less invasive, and more cost-effective Core Surveillance.

(2) CSA and Cases – Determine when or if components using experimentally validated lifetime assessment models need to be replaced in the enduring stockpile.

(3) High Explosives – Determine when main charges and boosters need to be replaced based on new predictive methods and non-destructive evaluation tools while examining early detection of potential changes in behavior related to safety, performance, and reliability.

(4) Non-Nuclear Components (NNC) – Deliver component-level lifetime assessments to the programs responsible for LEP and system refurbishment decisions. Capabilities developed will enhance the technical basis relative to the safety, use control, and reliability of components in the stockpile.

(5) Non-Nuclear Material (NNM) – Understand critical materials (e.g., organic, metallic, and glass/ceramic) properties and predict changes for both existing and replacement materials in the enduring weapons systems. Develop mature materials aging performance models along with advanced diagnostics and analytical techniques and apply the full complement of NNM capabilities to assist in strategies for identifying next-generation materials.

FY 2017-FY 2020 Key Milestones

- Complete an Enhanced Surveillance stockpile aging and lifetime assessment report to support the annual assessment process and the Technical Basis for Stockpile Transformation Planning (TBSTP).
- Deploy next generation predictive capabilities for CSAs, cases, HE, detonators and non-nuclear components and materials to support assessment and certification.
- Implement new system-level capabilities and technologies pertaining to the health of the enduring stockpile.
- Deploy next suite of Gas Transfer System diagnostics for surveillance.
- Refine CME evaluation activities for components in five component families.
- Develop readiness for B61-12 System Test Capability and improvements in data acquisition, combined environment, and hostile shock capabilities.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Enhanced Surveillance $37,799,000	**Enhanced Surveillance $38,724,000**	**Enhanced Surveillance +$925,000**
• Complete an Enhanced Surveillance stockpile aging and lifetime assessment report to support the annual assessment process. • Continue long-term aging studies on detonator HE. • Develop next generation predictive capabilities for NNC and NNM to support assessment certification. • Modernize WETL System Tester capabilities and new diagnostic technologies for system lab testing. • Enhance the development of component material evaluation (CME) knowledge and capabilities for selected non-nuclear components with recommendations on transition to Core Surveillance as appropriate. • Characterize the aging behavior of legacy and potential replacement materials and components in coordination with decision making on LEPs and SFIs. • Improve identification and understanding of aging mechanisms in the legacy stockpile; execute recommendations from the Component Evaluation Program Planning Committees (CEPPCs); and, advance these improvements for implementation into Core Surveillance.	• Complete an Enhanced Surveillance stockpile aging and lifetime assessment report to support the annual assessment process and TBSTP. • Continue demonstration of a broad science-based CME program for predictive assessment and uncertainty quantification for selected components. • Complete initial aging and compatibility assessment of newly remanufactured TATB and LLM-105. • Continue CME evaluation activities on a reduced, reprioritized set of component families. • Refine lifetime assessments across the nuclear explosive package materials and components for LEP/TBSTP use. • Develop and implement new diagnostics to study aging effects on legacy systems. • Refine aging models for stockpile silicone polymers, adhesives, and potting compounds.	• This increase stabilizes base capabilities that will continue support of ongoing multi-year aging studies, predictive modeling efforts, required deliverables for the B61-12 LEP and W88 Alt 370, and development of targeted non-destructive evaluation testing/diagnostics. Planned pursuit of additional advanced diagnostics (e.g., neutron imaging) for the legacy as well as future stockpile and new additive manufacturing initiatives are no longer within the scope of the planned Enhanced Surveillance subprogram based on current FYNSP projections.

Engineering Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Technology Maturation Capabilities - The annual progress towards the maturation of technologies and stockpile assessment capabilities as measured by the number of deliverables in the implementation plans completed.							
Target	20 deliverables	22 deliverables	17 deliverables	13 deliverables	14 deliverables	12 deliverables	12 deliverables
Result	20						
Endpoint Target	Until the last nuclear weapon system in the stockpile is dismantled, NNSA will continue to mature technologies and stockpile assessment capabilities to support Directed Stockpile Work nuclear weapons refurbishment and assessment activities.						

Engineering
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	21,493	7,982	4,406	4,406	4,503	4,602	+99
Plant Projects (GPP) (<$10M)	1,138	1,132	2	2	2	2	0
Total, Capital Operating Expenses	**22,631**	**9,114**	**4,408**	**4,408**	**4,505**	**4,604**	**+99**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	21,493	7,982	4,406	4,406	4,503	4,602	+99
Total, Capital Equipment (including MIE)	**21,493**	**7,982**	**4,406**	**4,406**	**4,503**	**4,602**	**+99**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**1,138**	**1,132**	**2**	**2**	**2**	**2**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**1,138**	**1,132**	**2**	**2**	**2**	**2**	**0**
Total, Capital Summary	**22,631**	**9,114**	**4,408**	**4,408**	**4,505**	**4,604**	**+99**

Outyears for Engineering

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	4,703	4,806	4,912	+5,020
Plant Projects (GPP) (<$10M)	2	2	2	2
Total, Capital Operating Expenses	**4,705**	**4,808**	**4,914**	**+5,022**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	4,703	4,806	4,912	+5,020
Total, Capital Equipment (including MIE)	**4,703**	**4,806**	**4,912**	**+5,020**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	2	2	2	2
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**2**	**2**	**2**	**2**
Total, Capital Summary	**4,705**	**4,808**	**4,914**	**+5,022**

Inertial Confinement Fusion Ignition and High Yield

Overview

The Inertial Confinement Fusion Ignition and High Yield (ICF) program supports the U.S. Department of Energy's (DOE) national security goals by providing scientific understanding and experimental capabilities in high-energy-density (HED) physics for the validation of codes and models necessary to maintain a safe, secure, and effective nuclear weapons stockpile without underground testing. It supports stockpile assessment and certification and the Department's national security mission. Experimental validation of the models used in simulations is essential to having confidence in them. More than 99 percent of the energy from a nuclear weapon is generated in the HED state (pressures greater than 1 Megabar) that occurs once primary criticality is attained. The ICF program operates and conducts experiments in facilities that create these HED conditions. The investments in Inertial Confinement Fusion provide insights and information from experimental conditions that attempt to mimic aspects of nuclear explosions. They provide the experimental basis, in addition to archived data from the underground test program, that gives confidence in the codes and models used to support annual assessments and certifications, plan life extension programs, and resolve Significant Findings Investigations (SFIs). ICF facilities are the principle platforms on which the codes that couple transport processes with hydrodynamics models can be experimentally validated.

These insights and information are directly applicable to assessing the health of our nuclear weapons and making decisions on life extension options for future stockpile weapons. For example, the Stockpile Stewardship Program (SSP) has been developing advanced simulation capabilities to model nuclear weapons with sufficient fidelity to support certification, life-extension programs, and resolve SFIs. Science-based weapons assessments and certification require advanced experimental capabilities to validate simulations of nuclear weapon performance, understand properties of materials that will be used in the future stockpile, and strengthen the complex three-dimensional models developed to understand the boost process occurring in stockpile primaries. The ICF program contributes to these capabilities through the development and use of advanced experimental and theoretical tools and techniques, including state-of-the-art laser and pulsed power facilities for both ignition and weapon relevant non-ignition HED research and advanced simulation codes.

The ICF program supports stockpile stewardship through two principal experimental directions. First, through non-ignition HED physics research, development of diagnostics, and experimental expertise that directly supports the stockpile. Ongoing experiments explore issues in materials science, radiation transport, and hydrodynamics providing fundamental scientific knowledge relevant to nuclear weapons and are testing codes and models that underpin stockpile confidence. Second, the ICF program's goal is to achieve substantial thermonuclear burn and, ultimately, ignition in the laboratory. The demonstration and application of ignition and thermonuclear burn is important to validate models in the most extreme conditions generated in a nuclear explosion that cannot be accessed in the laboratory in any other way, and remains a major goal for the National Nuclear Security Administration (NNSA) and the DOE.

Since the early 1990s, demonstrating ignition in the laboratory has been an essential element of the U.S. Stockpile Stewardship program. From the late 1970s and through the 1980s, a basic question existed as to the possibility of designing and constructing a facility that could create implosion conditions consistent with then code predictions for laboratory ignition. Initial ignition experiments conducted after more than 10 years of National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory construction showed fundamental gaps in our understanding and incompleteness of those code predictions, revealing physics unknowns and technical complexities that require time to study and resolve. The scientific hypotheses that guide today's program of work are aimed at closing those gaps and setting a new path in ICF for demonstrating laboratory fusion ignition and eventually multi megajoule fusion yields. Implosions designed to be more stable have resulted in implosion performance closer to code simulations and close to the onset of alpha-heating. This represents a significant advance in understanding some necessary, but not sufficient, conditions to achieve ignition, with record neutron yields measured during implosions. Further progress will require a better understanding and control of hydrodynamic instabilities and implosion symmetry. It is important to continue to pursue this grand challenge to maintain scientific leadership and credibility while recruiting scientists and engineers who will participate in stockpile stewardship. As much of this research is open and shared, ICF program research provides an avenue for maintaining the quality of relevant science through the broader scientific community.

The Department requests $502,450,000 in FY 2016 for the ICF program, a $10,445,000 (-2 percent) decrease from the FY 2015 Congressional Budget Request.

NNSA continually reviews the planning basis for programs to ensure that budget and resources are aligned with requirements. Prioritizing research capabilities across multiple program elements is done in the context of requirements from the Nuclear Weapons Council (NWC) and the Requirements and Planning Document (RPD), and the25-year Stockpile Stewardship Management Plan (SSMP). Consistent with DOE's Strategic Plan 2014 – 2018, NNSA initiated a workshop, held in June 2014, to develop a 10-year scientific strategic vision for the high energy density sciences in support of the nuclear weapons program. The workshop had more than 150 attendees and addressed both ignition and non-ignition experiments across all national ICF facilities. The strategic vision formed from the workshop is the foundation for the 10-year HED Strategic Plan under development in FY 2015, a resource-informed plan for priority research directions for ignition and non-ignition HED science. The Plan will guide decisions on the program of work and on development of new capabilities in a resource constrained environment. The results of this effort are reflected in this narrative.

The FY 2016 ICF Program continues the strong emphasis on HED weapons experimental support and development of advanced capabilities while continuing a balanced effort in ignition and alternate ignition concepts. Funding for research in support of stockpile science and near-term stockpile needs will continue in the Support of Other Stockpile Programs, leveraging ICF's expertise and capabilities and guided by the 2015 10-year HED Strategic Plan. This leverages ICF's expertise, providing additional support for the HED weapons efforts and NNSA's broader Stockpile Stewardship Program (SSP) needs as outlined in the Predictive Capability Framework (PCF).[a] In FY 2015, there is a plan to review progress toward laboratory ignition and the contributions of non-ignition HED experiments to weapons science and stockpile stewardship. The review will inform decisions on the ICF/HED path to ignition and program balance. Both integrated experiments and focused experiments in indirect drive, direct drive, and magnetically-driven implosion experiments will continue to look at the behavior and physics of ignition targets to improve the confidence in the simulations and to provide feedback to resolve the outstanding physics questions. This is a discovery-driven, rather than schedule-driven, program that will provide more opportunities for comparison with simulations and feedback to resolve the outstanding physics questions.

The increasing demand for shot time on the NIF at Lawrence Livermore National Laboratory (LLNL) for both ignition and non-ignition experiments to support the weapons program requires that its shot rate be increased. In FY 2014, a plan was developed to increase the shot rate and implementation began. By the end of December 2014, 11 of the 20 recommendations were implemented. The NIF demonstrated a significantly improved shot rate in FY 2014, with increasing shot rates each quarter. In FY 2014, 191 shots were executed, with 69 completed in the last quarter. The goal for FY 2015 is to complete 300 shots. Most of the improvement has come from actions taken to increase the time the facility spends taking shots and reducing time for maintenance or installation and commissioning of new capabilities. Completion of the remaining recommendations in FY 2015 and FY 2016 will further improve the shot rate. In FY 2015, NNSA will develop and begin implementation of a 5-year National ICF/HED Diagnostics Plan to optimize development of diagnostics for NNSA's HED facilities. Implementation of the plan will necessitate movement of funds between sites to improve the cost-effectiveness and maximize return on the nation's investment.

The FY 2016 Request supports operations at NNSA's three major HED facilities; the NIF, the Z Facility at Sandia National Laboratories (SNL), and the Omega Laser Facility at University of Rochester's Laboratory for Laser Energetics (LLE), including funding for support of experiments by external users. The three major HED facilities will be operated under their respective governance plans. Emphasis on improving operational efficiencies at all facilities will continue, with prioritization and execution of the most urgent experiments in support of the stockpile.

The FY 2016 budget provides around $79,540,000 for operation and utilization of the Z facility at Sandia National Laboratories (SNL). This includes $44,540,000 within the ICF program and approximately $35,000,000 within the Science program.[b] The ICF budget provides $322,500,000 for the operations of the NIF for all users and the ICF program at LLNL, and $60,500,000 for the operations of the Omega Laser Facility for all users and the ICF program at the University of

[a] The Predictive Capability Framework (PCF) is described in the *FY 2015 Stockpile Stewardship and Management Plan.*
[b] Does not include Science funding for Capabilities for Nuclear Intelligence at SNL.

Rochester. In FY2016, roughly 8% of NIF use time will be reserved for partnering with academic institutions for science of mutual benefit to NNSA. Given this benefit, operational costs for these experiments are covered by NNSA while much of the experiment's design and analysis are provided by the academic institution in kind.

Highlights of the FY 2016 Budget Request

The FY 2016 ICF program will build upon the accomplishments of the previous years, including: 1) providing key data that reduces uncertainty in our predictions of nuclear weapons performance; 2) safely obtaining data on the properties of high-Z (high atomic weight) materials, including plutonium, under conditions that have not been previously reached in the laboratory on Z Facility at SNL and the NIF at LLNL; 3) fielding platforms at Omega and NIF to measure the complex hydrodynamic behavior of materials that is a potential concern for SFIs; 4) ongoing progress in understanding the issues that are limiting the demonstration of ignition at the NIF, informed by the FY 2015 Review, including energy coupling to the capsule, symmetry, and mix; 5) building upon the indirect drive "high foot" platform that has produced record performance, continuing experiments with alternate ablator materials, and using the record neutron yields for nuclear weapons-related experiments; 6) continuing progress in the development of the direct-drive ignition alternative on Omega and NIF, informed by the FY 2015 Review; 7) building on progress demonstrated in magnetically-driven implosions by performing magnetized liner inertial fusion (MagLIF) experiments, informed by the FY 2015 Review; 8) ongoing implementation of the National Diagnostic Strategy to optimize the cost-effective development of diagnostics for the NNSA's HED facilities; 9) continued safe operation of NNSA's major HED facilities, NIF, Omega, and Z, in accordance with their Governance Plans, and 10) continuing improvements in operational efficiency at the NIF through implementing the plan developed in FY 2014. In FY2015, NIF introduced a new materials science platform to study plutonium. These experiments use quantities of plutonium that are within the bounds that define a Radiological Facility.

Major Outyear Priorities and Assumptions

Outyear funding levels for the ICF program total $2,198,371,000 for FY 2017 through FY 2020. The ICF program provides the scientific understanding and experimental capabilities in high-energy density physics that are needed to study matter under extreme conditions and support science-based weapons assessments and certifications to fulfill our national security mission. The ICF Program will balance efforts in HED weapons research with the ongoing investigation of ignition, including alternate ignition concepts. The FY 2015 review of progress toward ignition by the DPAC subcommittee and the program requirements of the evolving stockpile will inform research directions and investment decisions in HED capabilities. Specific investments in new capabilities for alternative ignition platforms will be made in a staged manner based upon requirements-informed prioritization and resource constraints. The development and use of a robust ignition platform remains a high priority, as is performing HED experiments for which ignition is not required. The record neutron yields obtained with the "high foot" platform will be exploited to support program requirements. The 10-year HED Strategic Plan, completed in FY 2015, requires new experimental platform development on NIF, Omega, and Z, in areas such as advanced hydrodynamics and mixing, and radiation flow in complex geometries, extension of materials equation-of-state (EOS) and strength to higher pressures (including high-Z materials such as plutonium). It includes developing new platforms for Outputs and Environments testing. These will require more sophisticated techniques, diagnostics, and simulation capabilities, as well as increasing the number of shots. The improved operational efficiency at the NIF will help meet this increased demand. The outyears budget assumes the funding level for the ICF program will be sufficient to provide the advanced experimental capabilities, including experimental platforms, diagnostics, theoretical tools and techniques that are needed to conduct the experiments and the verify codes needed for stockpile assessment and certification.

Inertial Confinement Fusion Ignition and High Yield
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Inertial Confinement Fusion Ignition and High Yield					
Ignition	80,245	80,005	77,994	73,334	-4,660
Support of Other Stockpile Programs	15,001	14,935	23,598	22,843	-755
Diagnostics, Cryogenics and Experimental Support	59,897	59,483	61,297	58,587	-2,710
Pulsed Power Inertial Confinement Fusion	5,024	5,022	5,024	4,963	-61
Joint Program in High Energy Density Laboratory Plasmas	8,198	8,198	9,100	8,900	-200
Facility Operations and Target Production	345,592	344,751	335,882	333,823	-2,059
Total, Inertial Confinement Fusion Ignition and High Yield	**513,957**	**512,394**	**512,895**	**502,450**	**-10,445**

Outyears for Inertial Confinement Fusion Ignition and High Yield
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Inertial Confinement Fusion Ignition and High Yield				
Ignition	75,432	77,112	79,032	80,952
Support of Other Stockpile Programs	23,363	23,864	24,414	24,964
Diagnostics, Cryogenics and Experimental Support	68,125	76,800	80,760	84,790
Pulsed Power Inertial Confinement Fusion	4,945	4,945	4,945	4,945
Joint Program in High Energy Density Laboratory Plasmas	9,492	9,865	10,000	10,000
Facility Operations and Target Production	344,053	353,465	358,422	363,686
Total, Inertial Confinement Fusion Ignition and High Yield	**525,410**	**546,051**	**557,573**	**569,337**

Inertial Confinement Fusion Ignition and High Yield
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Ignition: Decrease in ignition effort consistent with emphasis on priority HED weapons physics experiments and with the 10-year HED strategic plan.	**-4,660**
Support of Other Stockpile Programs: Decrease maintains strong ICF support of weapons physics HED research, consistent with the 10-year HED strategic plan.	**-755**
Diagnostics, Cryogenics, and Experimental Support: Decrease in funding slows pace of advanced diagnostics for both ignition and non-ignition experiments, partially mitigated through implementation of the National Diagnostic Plan.	**-2,710**
Pulsed Power Inertial Confinement Fusion: Slight reduction maintains the effort to advance the science of magnetically-driven implosions.	**-61**
Joint Program in High Energy Density Laboratory Plasmas: Slight reduction maintains basic science research grants that support academic participation in HED physics.	**-200**
Facility Operations and Target Production: Decrease reduces operations at HED facilities and target fabrication for experiments, partially mitigated by improvements in operational efficiencies.	**-2,059**
Total, Inertial Confinement Fusion Ignition and High Yield	**-10,445**

Inertial Confinement Fusion Ignition and High Yield
Ignition

Description

The development of thermonuclear ignition in the laboratory and its use as a platform provides the scientific and technical understanding to address key weapons issues and to validate the codes needed to assess and certify the stockpile in a regime not accessible in any other way. Demonstrating ignition is a major goal for the NNSA and DOE. The Ignition subprogram supports research activities that optimize prospects for achieving ICF ignition on the NIF, the development and applications of robust, burning-plasma platforms, and advanced ignition. Detailed theoretical designs and simulations (in 2- and 3-dimensions) support experiments on NNSA's HED facilities, closely coupled with the Advanced Simulation and Computing (ASC) and the Science programs. The near-term emphasis is on those activities required to develop a detailed physics understanding to improve ignition designs and to demonstrate ignition on the NIF. In the longer-term, this program will develop advanced ignition concepts that may provide advantages over the current indirect-drive ignition platform, such as higher yield and/or gain. Achieving ignition and understanding any limitations to the simulation tools are key parts of meeting DOE's national security goals. The Science programs, Directed Stockpile Work (DSW), and other stockpile program elements rely on the capabilities developed in this subprogram to successfully execute their programs.

FY 2017-FY 2020 Key Milestones

- Development of the first ignition platform to support SSP needs. The ignition platform must be repeatable and sufficiently robust such that the effects of minor changes in design can be clearly identified.
- Use the first ignition platform to support SSP needs, in particular critical experiments requiring burning plasmas and igniting plasmas, in support of the PCF. Demonstrate one or more Advanced Ignition concepts on the NIF to meet requirements of SSP physics applications of ignition.
- Use the high neutron yields of sub-ignition and igniting targets for experiments in support of the PCF.
- Develop an understanding of the interrelated roles of time-dependent symmetry, hydrodynamic instabilities and mix, and laser plasma instabilities and hot electron generation on the performance of ignition target designs.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Ignition $77,794,000	**Ignition $73,334,000**	**Ignition -$4,660,000**
• Conduct Progress Review of all fusion approaches with respect to the program plan defined in FY 2013 and out-year plans for ICF and high yield platforms needs defined in the PCF. • Conduct physics and integrated indirect-drive experiments on NIF to: assess agreement between models and simulation of implosion compression and pressure, to test predictions of hydrodynamic instability and mix, and to quantify the effect of alpha heating in layered capsule implosions. • Conduct physics and integrated experiments with an alternate ablator to compare with plastic capsule ablators. • Continue integrated cryogenic Deuterium-Tritium (DT) implosions on Omega to establish the predictive basis for NIF-equivalent hydro performance. • Conduct polar direct drive experiments to test alternate ablators designed to mitigate hot electron production and to increase hydrodynamic efficiency, and to assess the impact of laser imprinting on shell stability and to study target options for imprint mitigation. • Continue NIF Polar Drive experiments to study crossed beam energy transfer mitigation.	• Conduct experiments to test modeling of hohlraum energy transport and dynamics. • Develop techniques to measure time dependent symmetry and its effect on performance in indirect-drive targets. • Continue integrated cryogenic DT implosions on Omega to establish the predictive basis for NIF-equivalent hydro performance. • Develop an implementation plan for crossed beam energy transfer mitigation. • Develop a working concept to field a layered target for polar direct drive experiments.	• The ignition subprogram budget is decreased $4,660,000 (-6.0%). This is consistent with NNSA's increased emphasis on priority weapons physics research and the 10-year HED Strategic Plan.

Inertial Confinement Fusion Ignition and High Yield
Support of Other Stockpile Programs

Description

High-energy-density (HED) physics/weapon relevant experiments using the ICF program's suite of HED facilities are key contributors to assessing and certifying the stockpile and to meeting DOE's security goals. This subprogram leverages the experience of the ICF-funded researchers to support NNSA's SSP nuclear weapons-relevant HED physics needs, developing and integrating the experimental infrastructure and capabilities required to execute experiments on ICF facilities. This includes the development of laser, target, and diagnostic capabilities. The ICF's HED facilities are used to perform experiments where ignition and burn are not the focus – for example, material properties, hydrodynamics, and radiation transport. It includes platform and diagnostic development on NIF, Omega, Z and supporting facilities. The understanding gained and capabilities developed validate the codes used to certify the stockpile. The Science program, DSW, and other stockpile program elements rely on the capabilities developed in this subprogram to successfully execute their programs. Ongoing experiments test codes and models that underpin stockpile confidence and provide fundamental scientific knowledge relevant to nuclear weapons, supporting stockpile assessments and certifications. The subprogram develops and uses HED/ICF experimental capabilities and personnel to resolve important stockpile questions in cooperation with other components of the Office of Research, Development, Test, and Evaluation. NNSA is completing a 10-year HED Strategic Plan in FY 2015, focused on four topical areas: Nuclear (includes materials properties, hydrodynamics, and nuclear physics), Thermonuclear (includes mix, burn, plasma properties, and application of capsule output), Radiation (includes radiation transport and opacities), and Output & Effects (includes weapon output, weapon effects, and forensics). The strategic plan is reflected in this narrative. Work within this subprogram is performed in collaboration with the Science program.

FY 2017-FY 2020 Key Milestones

- In FY 2017, demonstrate a deuterium-tritium burn platform that meets the needs of the SSP.
- Continue support for experiments and platforms identified in the 10-year HED Strategic Plan.
- Continue to develop platforms for initial experiments to support validation of opacity models
- Demonstrate platform that can acquire high pressure materials data.
- By FY 2018, complete initial set of experiments identified in the 10-year HED Strategic Plan.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Support of Other Stockpile Programs $23,598,000	**Support of Other Stockpile Programs $22,843,000**	**Support of Other Stockpile Programs -$755,000**
• Provide support for experiments and non-ignition HED data using NIF, Omega, Z, and other facilities to support NNSA's SSP needs. • Provide support for experiments, acquire high-pressure material data and develop platforms to validate models of secondary performance and to validate opacity models. • Develop a predictive capability for complex hydrodynamics and to determine aspects of a predictive mix model. • Continue to develop and use platforms that can acquire high-pressure materials data. Conduct experiments on high-Z (high atomic weight) materials, including plutonium, on Z and NIF. Conduct the SSP-relevant high-Z material dynamic diffractions experiments at high strain rate and high pressure on NIF. • Obtain first high-energy backlit images of the evolution of complex hydrodynamics experiments. • Complete first series of turbulence experiments for model validation. • Start first radiation transport experiment in complex SSP-relevant geometry. • Provide platform and diagnostic capabilities for validating the impact of surety technologies in the future stockpile. • Complete the 10-year HED Strategic Plan that supports the requirements of the SSMP.	• Measure the effect of shell mixing on deuterium tritium burn. • Provide support for experiments and non-ignition HED data using NIF, Omega, Z, and other facilities to support NNSA's SSP needs. Continue to develop and use platforms that can acquire high-pressure materials data that supports the PCF. Provide data in support of PCF pegposts, including a materials data set on plutonium with the diffraction platform on NIF. • With the Science program, continue implementation of 10-year HED Strategic Plan to support the requirements of the SSMP, including demonstrating an HED-coupled hydro-burn platform. • Validate models relevant to thermonuclear burn. • Provide platform and diagnostic capabilities for validating the impact of surety technologies in the future stockpile.	• The Support of Other Stockpile subprogram's FY 2016 budget request is $22,843,000, a decrease of $755,000 (-3.2%). The decrease slows experimental efforts while maintaining strong ICF support for HED weapons research, consistent with the 10-year HED Strategic Plan.

Inertial Confinement Fusion Ignition and High Yield
Diagnostics, Cryogenics, and Experimental Support

Description

Science-based weapons assessments and certification require advanced experimental capabilities that can create and study matter under extreme conditions that approach the HED environments found in a nuclear explosion. This subprogram develops the specialized technologies needed for ignition and HED experiments on ICF facilities, diagnostics, cryogenic systems, and user optics. It includes the design and engineering of a complex array of diagnostic and measurement systems, including advanced diagnostics that operate in the harsh ignition environment, and the associated information technology subsystems needed for data acquisition, storage, retrieval, visualization, and analysis. The data generated by these diagnostics provides key information required for HED physics experiments. This subprogram develops and deploys user optics to meet the needs of a broad range of experiments for national security applications and for ICF, HED, and fundamental science applications. It provides key capabilities required for experiments to study matter under extreme conditions at the HED facilities. The development of advanced diagnostics that operate in the harsh weapon-related physics environment is required to use ignition as a tool to support stockpile certification through verification of codes. Major activities in this subprogram in FY 2016 include the implementation of a National ICF/HED Diagnostics Plan to cost-effectively develop the highest priority diagnostics to meet the program's needs.

FY 2017-FY 2020 Key Milestones

- Continue efforts from FY 2015 to develop and support diagnostic capabilities, cryogenic systems, and user optics at NIF and Omega, at a pace commensurate with facility operations.
- Engineer a polar-drive target insertion cryostat for the NIF.
- Continue efforts on the NIF advanced diagnostic suite as defined in the FY 2016 Diagnostics Plan, including installing some diagnostics that can operate in the harsh ignition environment. Examples include a mirrored gated x-ray detector and a high resolution gamma ray diagnostic.
- Continue development, testing, and deployment of advanced diagnostics on NIF, Omega, and Z.
- In FY 2017, complete NIF advanced diagnostics suite defined in FY 2014.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Diagnostics, Cryogenics and Experimental Support $61,297,000	**Diagnostics, Cryogenics and Experimental Support $58,587,000**	**Diagnostics, Cryogenics and Experimental Support -$2,710,000**
• Continue efforts from FY 2014 to develop and support diagnostic capabilities, cryogenic systems, and user optics at NIF and Omega, at a pace commensurate with facility operations. • Continue development and testing of advanced diagnostics on NIF, Omega, and Z, including: development of a fifth-harmonic probe beam and the Compton gamma spectrometer on NIF, completion of a high resolution soft x-ray spectrometer for NIF, deploying a gated Kirkpatrick-Baez x-ray imager on OMEGA and an ultrahigh resolution x-ray spectrometer on the OMEGA EP Laser, and the magnetic recoil spectrometer, gamma reaction and neutron burn history diagnostics for Z. • Develop and implement a 5-year National ICF/HED Diagnostics Plan that identifies gaps in capabilities, prioritizes diagnostics for development and implements the most cost-effective approach for research, development, testing of new diagnostics.	• Continue efforts from FY 2015 to develop and support diagnostic capabilities, cryogenic systems, and user optics at NIF, at a pace commensurate with facility operations. • Continue development and testing of advanced diagnostics on NIF, Omega, and Z, including: extending x-ray spectrometer capability to 10-20 kiloelectronVolts (keV) on NIF, developing time-resolved x-ray diffraction diagnostics and higher photon energy x-ray imaging for NIF, Omega, and Z, design of a fifth harmonic probe beam for OMEGA, develop higher time-resolution gamma spectrometer and a time-dependent neutron spectrometer for NIF, ongoing improvements to the beamlet laser on Z. • Continue implementation of the National ICF/HED Diagnostics Plan.	• The Diagnostics, Cryogenics, and Experimental Support subprogram's FY 2016 budget request is $58,587,000, a decrease of $2,710,000 (-4.4%). The decrease in funding slows development of advanced diagnostics for both ignition and non-ignition experiments, with balancing to reflect investments identified in the National Diagnostics Plan.

Inertial Confinement Fusion Ignition and High Yield
Pulsed Power Inertial Confinement Fusion

Description

The Pulsed Power Inertial Confinement Fusion subprogram funds computational target design, experiments, and experimental infrastructure to assess pulsed power to achieve thermonuclear fusion in the laboratory. This subprogram's technical effort advances the science of magnetically-driven implosions as a means to achieving higher energy densities for SSP applications and as a promising path to achieving nuclear weapons relevant physics environments and high fusion yield. A mixture of focused and integrated experiments will be conducted to address key physics uncertainties and to improve the design of the target for the Magnetized Liner Inertial Fusion (MagLIF) approach to fusion ignition. Specific activities include performing Z experiments and relevant focused experiments on Omega and NIF, designing and building targets, improving simulation tools, and developing the experimental infrastructure (diagnostics and capabilities) needed to study advanced approaches to ICF. An objective is to determine the requirements for an advanced pulsed power driver that would achieve robust ignition and single-shot high fusion yield. The subprogram provides an ignition alternative that has potential to provide significantly higher yields than will be possible on the NIF and supports the assessment of pulsed power as a means to achieve thermonuclear fusion in the laboratory, including computational target design, experiments, and experimental infrastructure. It maintains the level of excellence in the technical staff at Z through challenging work that builds competencies critical to the SSP and helps avoid technological surprise.

FY 2017-FY 2020 Key Milestones

- Complete scaling study of MagLIF concept exploring sensitivity to laser energy and magnetic field strength.
- Perform optimized magnetized liner inertial fusion experiment at Z Facility.
- Assess the stagnation dynamics of MagLIF target experiments and compare with simulations.
- Evaluate fusion performance and stagnation plasma parameters at enhanced drive conditions using cryogenic fuel and compare results with simulations.
- Define requirements for and perform scoping studies of a pulsed power facility that can demonstrate robust ignition and high fusion yield.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Pulsed Power Inertial Confinement Fusion $5,024,000	**Pulsed Power Inertial Confinement Fusion $4,963,000**	**Pulsed Power Inertial Confinement Fusion -$61,000**
• Review progress of all fusion approaches with respect to the program plan defined at end of FY 2013 and out-year plans for ICF and high yield platforms. • Conduct integrated fusion (MagLIF) target experiments with increased laser energy and increased magnetic fields and begin scaling study. • Perform optimized classified fusion experiments on the Z Facility. • Compare accumulated data from magnetically-driven fusion experiments on Z with 3-D radiation magnetohydrodynamic simulations. • Evaluate fusion performance and stagnation plasma parameters at enhanced drive conditions and compare results with simulations.	• Review initial MagLIF performance over a range of optimized parameters, compare against goals, and identify most promising avenues of future research. • Evaluate, through small scale and Z facility experiments, the mechanism by which Magneto Rayleigh Taylor instabilities are seeded in magnetically driven liner implosions. • Document results of programs of laser heating experiments relevant to MagLIF (e.g., on Omega-EP, Z-Beamlet). Programs will include focused experiments on understanding the relevant physics (e.g., laser propagation in magnetized gasses) and optimization experiments aimed at increasing coupling of laser energy to deuterium fuel. • Assess, based on validated 2- and 3-dimensional simulations, magnetically driven target designs that could obtain fusion ignition on plausible next step pulsed power facilities.	• The Pulsed Power ICF subprogram's FY 2016 budget request is $4,963,000, a decrease of $61,000 (-1.2%). The slight decrease in funding slows the effort, but maintains support to advance the science of magnetically-driven implosions.

Inertial Confinement Fusion Ignition and High Yield
Joint Program in High Energy Density Laboratory Plasmas

Description

The Joint Program in High-Energy Density Laboratory Plasmas (HEDLP) supports DOE's mission by developing and maintaining a cadre of qualified researchers to support the SSP. It is a joint program with the DOE's Office of Science to support basic HEDP research that strengthens the Science, Technology, and Engineering base. This subprogram provides support for external users at the Omega Laser Facility through the National Laser Users' Facility (NLUF) Program and a joint solicitation with the Office of Science for HEDLP research to be performed at universities and DOE laboratories. It includes some of the HED-related Stockpile Stewardship Academic Alliances funding and other ICF-funded university programs. It funds academic programs to steward the study of laboratory HED plasma physics, maintain a cadre of qualified HED researchers and ongoing development of the next generation of scientists to provide expertise in HED today and qualified stockpile stewards for the future.

FY 2017-FY 2020 Key Milestones

- Continue activities from FY 2015 supporting research grants and cooperative agreements to fund individual investigator and research center activities.

Joint Program in High Energy Density Laboratory Plasmas

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Joint Program in High Energy Density Laboratory Plasmas $9,100,000	**Joint Program in High Energy Density Laboratory Plasmas $8,900,000**	**Joint Program in High Energy Density Laboratory Plasmas -$200,000**
• Continued support of High Energy Density Laboratory Plasma research through solicitations and awards to fund individual investigator and research centers activities. • Award grants from the FY 2014 Financial Opportunity Announcement for the National Laser Users' Facility (NLUF) Program.	• Continue research activities from FY 2015 in HED plasma physics.	• The Joint Program in High Energy Density Laboratory Plasmas subprogram's FY 2016 budget request is $8,900,000, a decrease of $200,000 (-2.2%), modestly reducing support for grants.

Inertial Confinement Fusion Ignition and High Yield
Facility Operations and Target Production

Description

This subprogram provides infrastructure and operations support for the ICF HED facilities that allow the ICF and Science programs to conduct the experiments needed to meet stockpile assessment and certification needs and broader goals of the SSP. It funds the experimental operations of NIF, Omega, and Z, to support ICF and Science subprogram's research to meet the stockpile assessment and certification needs. This subprogram supports fabrication of the very sophisticated targets required for related weapons physics experiments, as well as operation of the Trident facility at LANL, the ICF program including external reviews, and users' meetings such as the Omega Laser Facility Users Group and the NIF Users Group. Over half of the ICF budget supports experiments and operations at the ICF facilities, all of which will continue to be operated safely and securely. Efforts began in FY 2014 to identify and implement actions to increase the shot rate at the NIF. By the end of FY 2014, 11 of 20 recommendations described in the 120 day study of NIF operations were implemented; and changes to date have resulted in significantly improved shot rates.

FY 2017-FY 2020 Key Milestones

- Safely and efficiently operate HED facilities to support the needs of the SSP.
- Continued improvements in operational efficiency at all facilities and in target fabrication.
- Demonstrate Linear Transform Driver (LTD) module prototypes.
- Conduct annual assessment of infrastructure and mission needs and recommend following fiscal year investments across all HED facilities.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Facility Operations and Target Production $335,882,000	**Facility Operations and Target Production $333,823,000**	**Facility Operations and Target Production -$2,059,000**
• Continue operations at NIF, Omega, Z, and Trident facilities in support of stockpile stewardship experiments, basic science users, and other national security users. Additional funds for Z requested in the Science budget. • Operate NIF, Omega, Z, and Trident in a safe, secure, and efficient manner in accordance with their governance plans. • Continue to implement the recommendations of the 120-Day Study on Improving Efficiency at NIF. • Complete installation of the high-contrast front-end for NIF-ARC. • Conduct annual assessment of infrastructure and mission needs and recommend following fiscal year investments across all HED facilities.	• Continue activities from FY 2015, with similar level of facility operations at NIF, Omega, Z, and Trident. Continued strong emphasis on highest priority experiments in support of the stockpile and on improving operational efficiencies. • Continue improvements in efficiency at NIF through implementation of final recommendations from the 120-Day Study.	• The Facility Operations and Target Production subprogram's FY 2016 budget request is $333,823,000, a decrease of $2,059,000 (-0.6%). The reduction in funding for operations is partially mitigated by recent improvements in operational efficiencies.

Inertial Confinement Fusion and High Yield Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Key Extreme Experiments - Cumulative percentage of progress towards achievement of key extreme experimental condition of matter needed for predictive capability for nuclear weapons performance.							
Target	90% of progress (cumulative)	100% of progress (cumulative)	N/A	N/A	N/A	N/A	N/A
Result	90						
Endpoint Target	By the end of FY 2015, achieve temperature and pressure conditions in the laboratory relevant to weapons' primaries. This activity is performed in collaboration with the Science program within the Office of Research and Development.						
High Energy Density Physics Research - Cumulative percentage of progress towards completion of the high energy density physics research needed to support the nuclear weapons program as embodied in the Predictive Capability Framework (PCF).							
Target	N/A	10% of progress (cumulative)	20% of progress (cumulative)	30% of progress (cumulative)	40% of progress (cumulative)	50% of progress (cumulative)	60% of progress (cumulative)
Result	N/A						
Endpoint Target	By FY 2024, complete the ICF Program activities needed to complete the PCF pegposts, including demonstrating advanced burning plasma concepts that improve predictive capabilities and the application of physics for achieving ignition. These activities are performed in collaboration with the Science program within the Office of Research and Development.						

Note: NNSA replaced two ICF program measures, Advanced Ignition Demonstration and Application of Ignition, with a new single measure, High Energy Density Physics Research. The new measure reflects the recent rebalancing of the program to support both ignition and non-ignition SSP efforts and provides a better determination of relevant mission accomplishments for the ICF program.

Inertial Confinement Fusion Ignition and High Yield
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	17,002	10,608	2,085	2,085	2,131	2,178	+47
Plant Projects (GPP) (<$10M)	0	0	0	0	0	0	0
Total, Capital Operating Expenses	**17,002**	**10,608**	**2,085**	**2,085**	**2,131**	**2,178**	**+47**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	17,002	10,608	2,085	2,085	2,131	2,178	+47
Total, Capital Equipment (including MIE)	**17,002**	**10,608**	**2,085**	**2,085**	**2,131**	**2,178**	**+47**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**17,002**	**10,608**	**2,085**	**2,085**	**2,131**	**2,178**	**+47**

Outyears for Inertial Confinement Fusion Ignition and High Yield

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	2,226	2,275	2,325	+2,376
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**2,226**	**2,275**	**2,325**	**+2,376**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	2,226	2,275	2,325	+2,376
Total, Capital Equipment (including MIE)	**2,226**	**2,275**	**2,325**	**+2,376**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**2,226**	**2,275**	**2,325**	**+2,376**

Advanced Simulation and Computing

Overview

The statutory objective of the stockpile stewardship program is to ensure a high level of confidence in the safety, reliability, and performance of weapons in the nuclear stockpile. The Advanced Simulation and Computing (ASC) program provides high-end simulation capabilities to meet the requirements of the stockpile stewardship program. The program includes weapon codes, computing platforms, and supporting infrastructure. The ability to model the extraordinary complexity of nuclear weapons systems is essential to maintaining confidence in the performance of our aging stockpile without underground testing. The ASC program underpins the Annual Assessment of the stockpile and is an integrating element of the Predictive Capability Framework (PCF), as described in the FY 2016 Stockpile Stewardship Management Plan. ASC also provides critical capabilities informing activities to modernize the nuclear stockpile through timely execution of approved life extension programs. These modernization activities inform future stockpile reductions in support of U.S. nonproliferation objectives.

The ASC capabilities are also used to address areas of national security in addition to the U.S. nuclear stockpile. Through coordination with other Government agencies and other organizations within NNSA, ASC plays important roles in supporting nonproliferation, emergency response, nuclear forensics and attribution activities.

The FY2016 objectives include the following:

- Support assessments, certification, significant finding investigations (SFIs), current lifetime extension programs (LEPs), current alterations (Alts), and future refurbishments.
- Provide capabilities for weapons designers to complete ASC nuclear-performance baseline models for all stockpile weapon systems.
- Improve physics models to enable current and future NNSA goals without nuclear testing, such as, primary and secondary reuse, weapons safety, security, and survivability improvements, advanced weapons manufacturing, and broader nuclear security applications.
- Improve uncertainty quantification methods to overcome current limitations and to enhance utility for design, qualification, and certification.
- Influence and respond to technology changes occurring in computing industry.

The ASC program requests $623,006,000 in FY 2016, a $25,006,000 increase from the FY 2015 Enacted Appropriation. The increase funds program requirements that transition integrated codes to work efficiently on emerging high-performance computers, develop next-generation codes, and maintain computing resources and facilities. These capabilities are necessary to inform the annual assessment of the nuclear stockpile.

The drivers of the ASC program that require these budgets are as follows: The Nuclear Weapons Council approved the Long Range Stockpile Sustainment Strategic Plan, a key aspect of which is the “3+2 Strategy”. Supporting the 3+2 strategy requires further developed simulation and computing capabilities to enable progress in understanding energy balance, boost, and improved Equations of State for materials of interest. Annual assessments, Life Extension Program (LEPs) and Significant Finding Investigation (SFIs) require responsive modeling and simulation capabilities to better understand the impact of environmental and system conditions, including aging and the resolution of historical nuclear test anomalies. Investing in physics improvements in the Integrated Design Codes (IDC) will open design options for subsystem components for future LEPs.

The ASC computing capabilities are the key integrating mechanism across the nuclear weapons program through the IDCs. The assessment of the nation’s stockpile requires high-fidelity physical models. The IDCs support design studies, maintenance analyses, the Annual Assessment Reports (AARs), Life Extension Programs (LEPs), Significant Finding Investigations (SFIs), and weapons dismantlement activities. IDCs contain the mathematical descriptions of the physical processes of nuclear weapon systems and function. Combined with weapon-specific input data created by the nuclear weapons designers and engineers, the IDCs allow detailed simulations of nuclear weapons performance assessment, without the need for underground nuclear testing. Since the 1992 nuclear weapons testing moratorium, IDCs embody the repository of data from experiments conducted at the National Nuclear Security Administration’s (NNSA) high energy density facilities and legacy underground nuclear tests, as well as the accumulated experience of the Directed Stockpile

Work (DSW) program user community. The IDCs currently perform well for general mission-related activities; however, as the stockpile is life extended and aging takes the current stockpile further away from the data collected from underground tests, maintaining the nuclear weapons stockpile will require IDCs that are enhance prediction and use HPC resources more effectively.

A strategic driver for simulation and computing investment is the global shift in fundamental computing architecture. ASC capabilities that support the DSW mission are beginning to experience the effects of obsolescence as high performance computing technologies continue to advance and evolve to radically different and more complex (with massively concurrent cores, heterogeneous, and memory limiting) architectures. Maintaining currency with the commercial information technology sector will advance high-fidelity physics modeling capabilities required to maintain a credible deterrent and will address additional mission needs in non-proliferation, emergency response, nuclear forensics and attribution programs. To address this strategic driver, ASC is redirecting resources to minimize the disruptive mission impact of this change in High Performance Computing (HPC).

The ASC has developed a strategy for acquiring the advanced computing technologies needed to support current and future stockpile work that fully recognizes the need for the acquisition of exascale computing capabilities in the future. The ASC Program approach to advancing HPC technologies in this request is scoped to contribute to the foundation for an exascale supercomputer capability for the nation. The new Advanced Technology Development and Mitigation (ATDM) subprogram consolidates the investments Congress directed in FY2014 for exascale, into a unified effort to tackle challenges facing ASC in its support to stockpile stewardship and upon which future efforts can build. Since the technical problems facing the program today are similar issues, at lower scale, that exascale will need to overcome to be successful, investments in ATDM advance both exascale technologies and stockpile computing effectiveness.

Highlights of the FY 2016 Budget Request

- Complete work on defining early initial conditions for boost; begin updating the Integrated Design Codes with results.
- Deployment of Commodity Technology (CT) systems and complete Trinity system for the tri-labs' production computing environment to address stockpile stewardship issues and to advance predictive science.
- Continue the development of the Advanced Technology Development and Mitigation sub-program, to mitigate the impact new computer architectures on current code capabilities.
- Expand the predictive capability assessment suites to include additional underground tests, hydrodynamic tests, and scaled experiments.
- Each laboratory will maintain full baselines for all stockpile systems and use these baselines to improve the fidelity of their annual stockpile assessments.
- Coordinate and collaborate HPC technology research, development, and engineering activities in partnership with DOE/Advanced Scientific Computing Research (ASCR) office, to advance technologies that will eventually enable procurement of an exascale-class HPC platform.

Major Out-year Priorities and Assumptions

Out-year funding levels for the ASC program total $2,616,277,000 for FY 2017 through FY 2020.

Out-year priorities and assumptions are governed by the mission to provide leading-edge, high-end simulation capabilities needed to meet weapons assessment and certification requirements. The major assumption is that funding for the ASC program will suffice to support the LEP schedules (as approved by the Nuclear Weapons Council) through 2030. In this time frame, ASC-enabled modeling and simulation capabilities will contribute to the B61 LEP, W78-1 LEP study, application of re-use methods and technologies leading to increased confidence in the U.S. deterrent.

In the same period of FY 2016 through FY 2019, the Advanced Technology Development and Mitigation level of investment increases to $65M annually in FY 2017 through FY 2020. This level of funding strives to create a solid foundation of technology to support the application of exascale computing to the national nuclear security mission and enables progress on the most pressing technology challenges, but will not significantly advance the availability of exascale platforms.

FY 2014 Accomplishments

- Supported the W78/88-1 LEP mechanical design and component environments; optimization including test design/loading conditions; supported sub-assembly experiments.
- Demonstrated new methodology for use with models crucial to FY 2015 LANL/LLNL physics milestone.
- Ran 3D Global Security simulation on Sequoia with over 2 billion computational cells.
- Improved hydrodynamics and strength modeling capabilities for more realistic simulations of material break-up.
- Developed a new supercomputer performance benchmark that is more appropriate for scientific computing.
- Developed new method to calibrate equation of state models for use in hydrodynamic simulations.

Advanced Simulation and Computing
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Advanced Simulation and Computing					
Integrated Codes	143,153	142,896	149,189	149,189	0
Physics and Engineering Models	61,469	63,094	68,469	67,819	-650
Verification and Validation	48,878	49,840	52,878	52,878	0
Advanced Technology Development and Mitigation	35,000	35,000	50,000	64,000	+14,000
Computational Systems and Software Environment	118,628	108,452	109,181	120,837	+11,656
Facility Operations and User Support	162,201	169,351	168,283	168,283	0
Total, Advanced Simulation and Computing	**569,329**	**568,633**	**598,000**	**623,006**	**+25,006**

Out-years for Advanced Simulation and Computing
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Advanced Simulation and Computing				
Integrated Codes	151,153	153,153	154,231	160,546
Physics and Engineering Models	70,651	72,364	73,811	75,287
Verification and Validation	55,874	59,031	60,212	61,416
Advanced Technology Development and Mitigation	65,000	65,000	65,000	65,000
Computational Systems and Software Environment	128,057	130,000	135,000	140,000
Facility Operations and User Support	165,416	170,025	175,025	175,025
Total, Advanced Simulation and Computing	**636,151**	**649,573**	**663,279**	**677,274**

Advanced Simulation and Computing
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Integrated Codes: No change.	**0**
Physics and Engineering Models: Slight decrease reflects a shift to adapting to new computer architectures.	**-650**
Verification and Validation: No change.	**0**
Advanced Technology Development and Mitigation: Increase expands and develops advanced technology research and development with industry and co-design work.	**+14,000**
Computational Systems and Software Environment: Increase maintains Commodity Technology System procurement profile.	**+11,656**
Facility Operations and User Support: No change.	**0**
Total, Advanced Simulation and Computing	**+25,006**

Advanced Simulation and Computing
Integrated Codes

Description

Integrated codes (IC) contain the mathematical descriptions of the physical processes of nuclear weapon systems and function. Combined with weapon-specific input data created by the nuclear weapons designers and engineers, this allows detailed simulations of nuclear weapons performance assessment, without the need for underground nuclear testing. The IC subprogram funds the critical skills needed to develop, maintain and advance the capabilities of the large-scale integrated simulation codes that are needed for the following Stockpile Stewardship Program (SSP) and Directed Stockpile Work (DSW) activities: annual assessment; LEP design, qualification, and certification; SFI resolution; and safety assessments to support transportation and dismantlement. In addition, these capabilities are necessary for a host of related requirements such as nuclear counter-terrorism efforts (e.g. nuclear forensics, foreign assessments and device disablement techniques).

FY 2017-FY 2020 Key Milestones

- September 2017 - Understand architectures of future computing platforms and modify codes to run efficiently on ATS-1 and 2 platforms.
- September 2018 - Provide necessary code and modeling (both 2D and 3D) which informs development of future Life Extension Programs.
- September 2019 - Develop revisions to current Integrated Codes with improved parallelization, more modularity, and better standardization that are easily scalable and adaptable.
- Continue efforts in Ongoing User Support and maintenance; Capability Development, and Skills Accession.
- Demonstrate agile integrated design code (IDC) and engineering code development by running a single simulation of relevance to DSW on at least 50% of the ATS-1 platform, Trinity, within two years of machine acceptance on a red network.
- Demonstrate agile IDC and engineering code development by running a large number of Uncertainty Quantification (UQ) simulations relevant to DSW on the ATS-2 platform, Sierra, within two years of machine acceptance on a classified network. This should represent a significant improvement over what could be accomplished on the Sequoia platform.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Integrated Codes $149,189,000	**Integrated Codes $149,189,000**	**Integrated Codes $0**
User support and maintenance • Code builds and ports. • User training and assistance. • Regression testing and bug fixes. Capability development • Deliver improvements in nuclear performance assessment codes for boost and secondary performance. • Deliver improvements in safety codes to address multi-point safety issues. • Deliver capability in engineering assessment codes for hostile environments. • Deliver improvements in engineering assessment codes for normal and abnormal environments. • Begin focused effort to adapt existing code base to new architectures. Skills accession • Maintain an ongoing mentoring program for early career staff. • Collaborate with Predictive Science Academic Alliance Program (PSAAP) II centers on technical topics and staff recruitment.	Ongoing user support and maintenance • Code builds and ports. • As needed, user training and assistance. • Regularly scheduled testing and bug fixes. Capability development • Continue to improve nuclear performance assessment codes for boost and secondary performance. • Continue to improve safety codes to address multi-point safety issues. • Continue to improve engineering assessment codes for hostile environments. • Continue to improve engineering assessment codes for normal and abnormal environments. • Continue effort to adapt existing codes to new architectures. Workforce and accession • Maintain mentoring program for early career staff. • Continue collaboration with PSAAP II centers on technical topics and staff recruitment.	• No change, support and maintain the production codes and their users.

Advanced Simulation and Computing
Physics and Engineering Models

Description

The Physics and Engineering Models (PEM) subprogram within ASC provides the models and databases used in simulations supporting the U.S. stockpile. These models and databases describe a great variety of physical and engineering processes occurring in a nuclear weapon over its full life-cycle. The capability to accurately simulate these processes is required for annual assessment; design, qualification and certification of warheads undergoing Life Extension Programs; resolution (and in some cases generation) of Significant Finding Investigations; and the development of future stockpile technologies. The PEM subprogram is closely linked to the Science program, which provides the experimental data that informs development of new models used in simulation codes.

FY 2017-FY 2020 Key Milestones

- September 2017 - Calculations in support of improving boost models initiated.
- September 2018 - Verify weather loading models for reentry vibration.
- September 2019 - Phase transition kinetic model for EOS completed.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Physics and Engineering Models $68,469,000	**Physics and Engineering Models $67,819,000**	**Physics and Engineering Models -$650,000**
• Provide reactive flow models for high explosive (HE) detonation and burn that capture grain scale material heterogeneity and are computationally efficient. • Provide models for complex hydrodynamic processes that are sufficiently predictive to enable design and assessment of various stockpile options. • Provide models needed for certification on new safety options.	• Further develop reactive flow models for HE detonation and burn that capture grain scale material heterogeneity and are computationally efficient. • Refine models for complex hydrodynamic processes that are sufficiently predictive to enable design and assessment of various stockpile options. • Refine models needed for certification on new safety options.	• Slight decrease reflects planned workload in ongoing model development and implementation into codes.

Advanced Simulation and Computing
Verification and Validation

Description

The Verification and Validation (V&V) subprogram provides evidence that the models in the codes produce mathematically correct answers that reflect physical reality. The V&V subprogram funds the critical skills needed to apply systematic measurement, documentation, and demonstration of the ability of the models and codes to predict physical behavior. The V&V subprogram is developing and implementing Uncertainty Quantification (UQ) methodologies as part of the foundation for the Quantification of Margins and Uncertainties (QMU) process of weapons assessment and certification. The V&V subprogram also drives software engineering practices to improve the quality, robustness, reliability, and maintainability of the codes that evaluate and address the unique complexities of the stockpile. As nuclear test data is becoming less relevant with an aging stockpile, and as weapons designers with test experience leave the nuclear security enterprise, it has become increasingly important that the codes are verified and validated, so future generations of designers are confident in the use of these foundational tools.

During the planning period Verification and Validation efforts will continue, along with Predictive Capability Assessments to increase our abilities in dealing with complex safety and engineering issues with the nuclear weapons stockpile. With major modifications to adapt existing codes to future hardware a major focus of the IC subprogram and development of new codes a primary focus of the ATDM subprogram, V&V will ensure the modifications and new codes are subjected to thorough verification and validation activities – this will be a major focus area for the V&V subprogram.

FY 2017-FY 2020 Key Milestones

- September 2017 - Deliver a Verification and Validation Assessment of Code Implementations of Physics Models and Numerical Algorithms Using Small Scale Science Experiments and Test Problems
- September 2018 - Extend V&V methodologies to work on extreme scale platforms.
- September 2019 – Commence classified UQ analysis on Sierra platform.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Verification and Validation $52,878,000	**Verification and Validation $52,878,000**	**Verification and Validation $0**
Verification and Validation • Verify improvements in nuclear performance codes. • Verify improvement in safety codes to address multi-point safety issues. • Validate improvements to physics and material models. • Verify improvements in engineering codes for normal/abnormal/hostile environments. Predictive Capability Assessment • Assess predictive capability as improvements to codes and models are made available, including new nuclear material data. • Improve the primary and secondary common models against remaining relevant underground datasets. On-going user support and training • Provide training on the use of UQ tools. • Implement QA controls to ensure material and nuclear databases are correctly updated and maintained.	Verification and Validation • Continue to verify improvements in nuclear performance codes. • Continue to verify improvement in safety codes to address multi-point safety issues. • Continue to validate improvements to physics and material models. • Continue to verify improvements in engineering codes for normal/abnormal/hostile environments. Predictive Capability Assessment • Continue to assess predictive capability as improvements to codes and models are made available, including new nuclear material data. • Ongoing development of the primary and secondary common models. On-going user support and training • Provide training on the use of UQ tools. • Implement QA controls to ensure material and nuclear databases are correctly updated and maintained.	• No change.

Advanced Simulation and Computing
Advanced Technology Development and Mitigation

Description

The Advanced Technology Development and Mitigation sub-program includes laboratory code and computer engineering and science projects that pursue long-term simulation and computing goals relevant to both exascale computing and the broad national security missions of the NNSA.

ASC capabilities that support the DSW mission are beginning to stall, as high performance computing technologies are evolving to radically different and more complex (many-core, heterogeneous) architectures. Efficiency of the integrated design codes is falling significantly when run on the latest high performance computing (HPC) platforms, and this trend is expected to accelerate and spread unless mitigated. The program sees three major challenges to address through investment in this sub-program including: 1) the radical shift in computer architecture, 2) maintenance of the current millions of lines of Integrated Design Codes that took more than a decade to develop and validate, and 3) sustainment and adaptation of current capabilities as evolving computer technologies become increasingly disruptive to the broad national security missions of NNSA.

There are two focus areas for investment. Next Generation Code Development and Application is focused on long-term research that investigates how future code development must address new HPC challenges of massive, heterogeneous parallelism using new programming models and data management techniques developed through co-design of applications and systems. Next Generation Architecture and Software Development is focused on long-term computing technology research of extreme, heterogeneous architectures and to mitigate its impact and advance its capabilities for ASC simulation codes.

The ATDM sub-program tackles the most critical subset of issues that are occurring during this period of disruptive change in HPC architectures in order to continue the current level of support to the DSW mission.

FY 2017-FY 2020 Key Milestones

- Continue co-design at the NNSA labs.
- Develop new Integrated Design Codes taking advantage of evolving HPC architectures.
- Continue Fast Forward and Design Forward collaborations with industry.
- Demonstrate next-generation IDC technologies on Sierra platform in 2019.

Advanced Technology Development and Mitigation

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Advanced Technology Development and Mitigation $50,000,000	**Advanced Technology Development and Mitigation $64,000,000**	**Advanced Technology Development and Mitigation +$14,000,000**
• Proxy application development and analysis, hardware test bed deployment, interactions with external collaborators, • Trinity System's Application readiness • Sierra's burst buffer, compiler development, power management, application readiness • Next generation code project expansion • R&D projects in areas of processors, memory, interconnect, and system integration	• Proxy application development and analysis, hardware test bed deployment, interactions with external collaborators • Trinity System's Application readiness • Sierra's burst buffer, compiler development, power management, application readiness • Next generation code project and code design expansion • Expand R&D projects in areas of processors, memory, interconnect, and system integration	• Increase expands co-design efforts and industry collaborations.

Advanced Simulation and Computing
Computational Systems and Software Environment

Description

The Computation Systems and Software Environment (CSSE) subprogram builds the computing systems needed for weapons simulations. Since requirements of the ASC codes drives the program's need to achieve its predictive capability goals, the ASC program must continue to invest in and consequently influence the evolution of computational environments. Along with the powerful Commodity and Advanced Technology systems that the program fields, the supporting software infrastructure that is deployed on these platforms includes many critical components, from system software to Input/Output (I/O), storage and networking, and post-processing visualization and data analysis tools.

FY 2017-FY 2020 Key Milestones

- Acquire and deploy Commodity Technology System (CTS) 1 (March 2016-2018), Advanced Technology System (ATS) 2 (Sierra, September 2017) and ATS 3 (September 2020) systems and associated computing environment.
- Efforts will continue with the operation and deployment of current systems, as well as ASC Sierra which will be in General Availability mode in FY 2018.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Computational Systems and Software Environment $109,181,000	**Computational Systems and Software Environment $120,837,000**	**Computational Systems and Software Environment +$11,656,000**
Platform Operations • Operate Sequoia. • Operate TLCC2 systems. • Initiate deployment of Trinity. • Initiation of CTS1 procurement Planning • Complete CD-3 phase for ASC Sierra System. Capability Development • Continue providing readiness support to ASC code teams in porting and scaling applications on to Sequoia. • Development of tri-lab computing environment consisting of user tools, networks, file system, archival storage, and visualization and data analysis. • Oversee the jointly funded NNSA and DOE ASCR FastForward and DesignForward projects.	Platform Operations • Continue Sequoia operations. • Begin decommissioning of Cielo. • Continue TLCC2 systems operations. • Continue deployment of Trinity • Initial deployment of CTS1 clusters. Capability Development • Support ASC code teams in the porting and scaling of applications on to Trinity. • Further development of tri-lab computing environment consisting of user tools, networks, file system, archival storage, and visualization and data analysis. • Continue oversight of the jointly funded NNSA and DOE ASCR FastForward and DesignForward projects.	• Increase maintains Commodity Technology System procurement profile.

Advanced Simulation and Computing
Facility Operations and User Support

Description

The Facility Operations and User Support (FOUS) subprogram provides the facilities and services required to run nuclear weapons simulations. Facility Operations includes physical space, power, and other utility infrastructure, and Local Area/Wide Area Networking for local and remote access, as well as system administration, cyber-security, and operations services for ongoing support. User Support includes computer center hotline and help-desk services, account management, web-based system documentation, system status information tools, user training, trouble-ticketing systems, common computing environment, and application analyst support.

FY 2017-FY 2020 Key Milestones

- Provide general availability and production-level services for ATS1 (Trinity, September 2016), ATS2 (Sierra, September 2018) and CTS1 (starting in April 2016) systems.
- User Support and Capability Deployment efforts will continue through the planning period for users to achieve optimum levels of service from the investments in the ASC program.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Facility Operations and User Support $168,283,000	**Facility Operations and User Support $168,283,000**	**Facility Operations and User Support $0**
User Support • Provide Web documentation, user manuals, technical bulletins, training, hotline and help desk support for ASC users of Sequoia and TLCC2 systems. • Ensure a more persistent common computing environment for users to transition seamlessly among current production systems. • Develop and initiate action plan to increase overall availability of computer cycles to end users. • Provide operational support for reliable and secure production computing environment: system administration and operations, software and hardware maintenance, licenses and contracts, archival storage, computing environment security and infrastructure, production computing services, and tri-lab system integration and support. Capability Deployment • Complete planning and exercise contingency response plans. • Deploy newer file system and archival storage technologies to replace aging technologies. • Support the utilization of ASC codes and computing resources at the Kansas City Plant to solve production manufacturing problems through modeling and simulation.	Continued User Support • Incorporate the Trinity system into web documentation, user manuals, technical bulletins, training, hotline and help desk support for ASC users. Continue Sequoia and TLCC2 support. • Continue to pursue a common computing environment for users. • Maintain maximum availability of computer cycles to end users. Implement best practices. • Continue operational support for reliable and secure production computing environment. Ongoing Capability Deployment • Implement contingency response plans, as necessary. • Continue deployment of newer file system and archival storage technologies. • Continue support to the Kansas City Plant in the use of ASC codes and computing resources to solve production manufacturing problems.	• No change in budget, continued facility infrastructure improvements to support incoming HPC systems.

Advanced Simulation and Computing Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY2020
Reduced Reliance on Calibration - The cumulative percentage reduction in the use of calibration "knobs" to successfully simulate nuclear weapons performance.							
Target	44% cumulative reduction in the use of calibration "knobs"	46% cumulative reduction in the use of calibration "knobs"	53% cumulative reduction in the use of calibration "knobs"	60% cumulative reduction in the use of calibration "knobs"	63% cumulative reduction in the use of calibration "knobs"	71% cumulative reduction in the use of calibration "knobs"	78% cumulative reduction in the use of calibration "knobs"
Result	44						
Endpoint Target	By the end of FY 2024, 100% of selected calibration knobs (non-science based models) affecting weapons performance simulation have been replaced by science-based, predictive phenomenological models. Reduced reliance on calibration will ensure the development of robust ASC simulation tools. These tools are intended to enable the understanding of the complex behaviors and effect of nuclear weapons, now and into the future, without nuclear testing. Note: Modifications of the Predictive Capability Framework (PCF) goals in FY 2013 provided better programmatic alignment with near-term Directed Stockpile Work (DSW) requirements and more realistic long-term improvements in simulation capability. To better quantify improvements within the integrated performance codes in terms of "percent reduction in the use of calibration knobs," a linkage between PCF goals and ASC milestones that can then be reflected with the performance indicator is required. The PCF goal modifications led to revised ASC L1 and L2 milestones and the re-baselining of the ASC performance indicator targets which is evident with the change to the FY 2014 target from 50% in the FY 2014 request to 44% in the FY 2015 request.						

Advanced Simulation and Computing
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including Major Items of Equipment (MIE))							
Capital Equipment >$500K (including MIE)	339,712	108,468	75,410	75,410	77,069	78,765	+1,696
Plant Projects (GPP) (<$10M)	47,844	8,803	12,622	12,622	13,152	13,267	+115
Total, Capital Operating Expenses	**387,556**	**117,271**	**88,032**	**88,032**	**90,221**	**92,032**	**+1,811**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	339,712	108,468	75,410	75,410	77,069	78,765	+1,696
Total, Capital Equipment (including MIE)	**339,712**	**108,468**	**75,410**	**75,410**	**77,069**	**78,765**	**+1,696**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	38,124	8,803	9,562	9,562	9,772	9,987	+215
B-654 Livermore Computing Facility, LLNL	9,720	0	3,060	3,060	3,380	3,280	-100
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**47,844**	**8,803**	**12,622**	**12,622**	**13,152**	**13,267**	**+115**
Total, Capital Summary	**387,556**	**117,271**	**88,032**	**88,032**	**90,221**	**92,032**	**+1,811**

Outyears for Advanced Simulation and Computing

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including Major Items of Equipment (MIE))				
Capital Equipment >$500K (including MIE)	80,498	82,269	84,079	85,929
Plant Projects (GPP) (<$10M)	10,207	10,432	10,662	10,897
Total, Capital Operating Expenses	**90,705**	**92,701**	**94,741**	**96,826**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	80,498	82,269	84,079	85,929
Total, Capital Equipment (including MIE)	**80,498**	**82,269**	**84,079**	**85,929**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	10,207	10,432	10,662	10,897
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**10,207**	**10,432**	**10,662**	**10,897**
Total, Capital Summary	**90,705**	**92,701**	**94,741**	**96,826**

Readiness Campaign
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current[a]	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Readiness Campaign					
Non-Nuclear Readiness	55,407	55,205	0	0	0
Total, Readiness Campaign	**55,407**	**55,205**	**0**	**0**	**0**

Out-Years for Readiness Campaign
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Readiness Campaign				
Non-Nuclear Readiness	0	0	0	0
Total, Readiness Campaign	**0**	**0**	**0**	**0**

[a] Funding reflects the transfer of Non-Nuclear Readiness to the Component Manufacturing Development element under the Advanced Manufacturing Development program in accordance with the Consolidated and Further Continuing Appropriations Act, 2015.

Advanced Manufacturing Development

Overview

The Advanced Manufacturing Development (AMD) program develops, demonstrates, and deploys modern technologies necessary to enhance secure manufacturing capabilities and to ensure timely support for the production of nuclear weapons and other critical needs of the stockpile. In accomplishing its mission, this program enables Defense Programs to meet Department of Defense requirements while also maintaining the capability to provide rapid response to evolving national security requirements. The AMD mission is equally focused on developing new manufacturing capabilities for transition to the first-use programs, maintaining the base capability to support the current stockpile, and adapting new capabilities for follow-on use, thus providing potential cost savings and reductions in waste, floor space requirements, and production time.

The AMD program is comprised of three subprograms: the Additive Manufacturing, Component Manufacturing Development, and Process Technology Development subprograms. AMD investments are focused on development of manufacturing capabilities and production technologies at low manufacturing and technology readiness levels.

The Additive Manufacturing subprogram is an initiative created to vet manufacturing concepts aimed at shortening production schedules and design cycles. This one-year effort in fiscal year (FY) 2015 is focused on gaining a better understanding of the feasibility of making longer-term investments that will result in reduced costs of design-to-manufacture iterations, fully characterize additive manufacturing processes and capabilities, and produce methodologies that enable qualification and certification for weapons applications. In FY 2016, funding for additive manufacturing development will transition to the relevant programs in support of their specific mission requirements.

The Component Manufacturing Development (CMD) subprogram supports multi-site, multi-warhead component manufacturing capability development that ensures production readiness for first production use in Life Extension Programs (LEPs), Limited Life Components (LLC), Alterations (Alts), and Modifications (Mods). Development of these technologies is subject to a manufacturing readiness level (MRL) assessment process to make informed decisions. Of the nine MRLs, ranging from manufacturing assessment (MRL 1) to stable production (MRL 9), the CMD subprogram is responsible primarily up to manufacturing process development (MRL 5). The LEP or Stockpile Systems subprograms under the Directed Stockpile Work (DSW) program assume responsibility at around MRL 6 for further development and application to a specific system's production requirements.

The CMD subprogram coordinates investments with the Engineering and Science programs, and DSW programs to align weapon technology and component manufacturing development activities to meet mission requirements on time. It also coordinates between production and design agencies on manufacturability of newly designed components to match production capabilities to design requirements. Project planning also considers Readiness in Technical Base and Facilities (RTBF) acquisition schedules to coordinate selection and insertion of production capabilities to reduce facility life-cycle costs.

The Process Technology Development subprogram supports the development, demonstration, and utilization of new production technologies to enhance nuclear manufacturing capabilities for nuclear weapon materials. This subprogram ensures new technologies with the potential to shorten production schedules, reduce risks, or enhance personnel safety by having a dedicated funding source to reach optimal levels of maturity without competing with other programmatic priorities. Presently, the subprogram is focused on uranium processing technology, specifically by acquiring major items of equipment for the Y-12 National Security Complex (Y-12).

Highlights of the FY 2016 Budget Request

The budget peaks in the FY 2015-2016 timeframe to adequately support production readiness for the B61-12 LEP and W88 Alt 370 with production technologies that have multi-application capability. New work will be initiated related to electronics-based arming, fuzing, and firing technologies that requires significant technical effort to reduce the cost of replacing sunset technologies. In particular, work will be conducted on an advanced fireset, manufacturing inspection and testing, mechanism and initiation system development, data management, optical switch, and trusted and secure manufacturing. Advanced manufacturing work will also begin in support of reuse, refurbishment, and with proper

authorization replacement of pit components. Further, methods to produce insensitive high explosives that meet war reserve specifications and are less expensive will be developed and evaluated.

The priority for the Process Technology Development subprogram in FY 2016 is to fund three major items of equipment (MIE), calciner and electro-refiner and machine chip processing, to support ceasing enriched uranium programmatic operations in Building 9212 at Y-12 by 2025.

Major Out-Year Priorities and Assumptions

Out-year funding levels for the AMD program totals $369,176,000 for FY 2017 through FY 2020. Upon completion of B61-12 LEP and W88 Alt 370 work, the focus will be on base technologies applicable to multiple systems, as well as the cruise missile warhead.

The out-year funding for the Additive Manufacturing subprogram is $0 for FY 2017 through FY 2020. This is a one-year endeavor in FY 2015, so future activities will be funded through relevant programs in support of their specific mission requirements.

The out-year funding for the CMD subprogram totals $270,570,000 for FY 2017 through FY 2020. The subprogram priorities are to establish the base manufacturing capability that can support the first user and also support subsequent users through minor modifications when compared with establishing a new capability. CMD is responsible for developing common component manufacturing capabilities that directly support the B61 LEP and future LEPs, Alts, and Mods, This involves having the ability to mature a wide range of component manufacturing production processes and technologies for multi-system use and to meet DSW production requirements, while also addressing select system requirements.

The out-year funding for the Process Technology Development subprogram totals $98,606,000 for FY 2017 through FY 2020. Out-year priorities include one additional MIE, direct electrolytic reduction, in support of ceasing enriched uranium programmatic operations in Building 9212 at Y-12 by 2025.

Advanced Manufacturing Development
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Advanced Manufacturing Development					
Additive Manufacturing	0	0	12,600	0	-12,600
Component Manufacturing Development	0	0	75,000	112,256	37,256
Process Technology Development	0	0	19,600	17,800	-1,800
Total, Advanced Manufacturing Development	**0**	**0**	**107,200**	**130,056**	**22,856**

Out-Years for Advanced Manufacturing Development
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Advanced Manufacturing Development				
Additive Manufacturing	0	0	0	0
Component Manufacturing Development	86,659	57,136	62,766	64,009
Process Technology Development	19,613	22,100	28,201	28,692
Total, Advanced Manufacturing Development	**106,272**	**79,236**	**90,967**	**92,701**

Advanced Manufacturing Development
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Additive Manufacturing Development: The decrease reflects transition of funding responsibility to relevant programs in support of their specific mission requirements.	**-12,600**
Component Manufacturing Development: The increase reflects investments necessary to sustain manufacturing capabilities nearing end-of-life at Sandia National Laboratory (SNL), Los Alamos National Laboratory (LANL), and Savannah River National Laboratory (SRNL), as well as begin technology maturation work associated with the cruise missile warhead Life Extension Program.	**+37,256**
Process Technology Development: The decrease reflects a deferral of the Direct Electrolytic Reduction (DER) project while focusing available funding on continuing the acceleration of the Calciner and Electro-refiner projects, and initial efforts for the Chip Processing MIE. These latter projects support stopping enriched uranium programmatic operations in Building 9212 at the Y-12 National Security Complex by 2025.	**-1,800**
Total, Advanced Manufacturing Development	**+22,856**

Advanced Manufacturing Development
Additive Manufacturing

Description

The Additive Manufacturing subprogram aims to capitalize on the potential additive manufacturing technologies to improve the reliability and effectiveness of the stockpile; improve infrastructure responsiveness (i.e., reduce schedule risk, cost, and time-to-product); enable options to reduce technical hedge; enable understanding of and possibly reduce proliferation and technological surprise risk; and attract, train, and retain expert workforce through implementation of 21st century manufacturing technology.

Additive manufacturing, also known as 3-D printing, is an advanced manufacturing technology that has the potential to revolutionize production on a global scale and, in particular, can significantly benefit the Nuclear Security Enterprise. Additive manufacturing can benefit the stockpile by reducing risk to program schedule and improving cost performance. It is a production tool that can support modeling, subcritical experiments, Joint Test Assemblies, tooling, and stockpile components used in Life Extension Programs.

When deploying any new technology, gaining confidence in it for stockpile applications is a major challenge. With measured investments, and by leveraging existing programmatic work, near-term benefits of additive manufacturing will be realized while gaining understanding of the feasibility of making long-term investments for more challenging applications. As confidence is gained in the application of this advanced technology, funding for additive manufacturing development and integration within this subprogram will decline. In FY 2016, funding for additive manufacturing development will transition to the relevant programs in support of their specific mission requirements.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Additive Manufacturing $12,600,000	**Additive Manufacturing $0**	**Additive Manufacturing -$12,600,000**
• Initiate development of manufacturing processes, prototypes, and first production units for stockpile applications for: - Critical Tooling - Pads and Cushions - Other assemblies • Improve understanding of the science behind additive manufacturing through material testing and process modeling. • Develop a ten year strategic plan describing the potential and expected benefits of additive manufacturing to the Nuclear Security Enterprise.	• Program completed. No funds requested.	• This is a one-year endeavor after which the relevant program will assume the funding responsibility for applying the technology.

Advanced Manufacturing Development
Component Manufacturing Development

Description

The Component Manufacturing Development (CMD) subprogram develops and deploys multi-application weapon component manufacturing capabilities needed to replace sunset technologies, upgrade existing technologies, and introduce new technologies that support the nuclear weapons stockpile. This subprogram develops production capabilities required to support high explosive and other energetic materials production, development of nonnuclear and special materials products, and manufacturing processes for surety components that improve stockpile safety, reliability, and security.

The CMD subprogram mission scope is divided into four areas as follows:

1. **Advanced Manufacturability Studies**. Early manufacturability assessments of manufacturing readiness levels (MRL) 1 and 2 technologies, capabilities, and processes. Projects in this category are medium risk with high return on investment and are prioritized based on need and impact to programmatic stability. Activities include additive manufacturing, advanced initiation systems, next generation gas transfer systems, and advanced microelectronics.

2. **Manufacturing Process Development**. Manufacturing process characterization activities for all components from MRL 3 through MRL 5. These activities include, but are not limited to, prototype builds and testing, supply chain optimization and vendor qualification for trusted foundries, commercial-off-the-shelf purchases, and design-to-manufacture iterations with Design Agencies. These activities are transitioned to the appropriate program once MRL 5 is reached in accordance with memorandums of agreement.

3. **Equipment, Materials, and Infrastructure**. Development of tools, materials, and equipment that facilitate the production process including data management systems, workstation enhancements, material studies, and machine tool modernization.

4. **Manufacturing Diagnostic Development**. Design, development, and demonstration of the diagnostic capabilities necessary for production, inspection, testing, and qualification of nuclear weapon components. This includes, but is not limited to, electronic and mechanical testing, micro-focus chromatography, neutron generator testers, digital radiography, metal component certification, and canned subassembly screening processes.

FY 2017-FY 2020 Key Milestones

- Continue process development for electronic and mechanical components and subsystems as Sandia National Laboratories (SNL) and Kansas City Plant.
- Continue developing neutron generator testers per the SNL roadmap.
- Continue development and qualification of insensitive high explosives at Lawrence Livermore National Laboratory.
- Initiate transition of all manufacturing capabilities, equipment, and processes/procedures to the B61-12 Life Extension Program and W88 Alteration 370 for further maturation.
- Initiate manufacturability studies for all components required for the cruise missile warhead.
- Initiate multi-year developmental program to ensure continuous operations at the Savannah River Site for tritium loading, purification, storage, aging, and function tester stations.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Component Manufacturing Development $75,000,000	**Component Manufacturing Development $112,256,000**	**Component Manufacturing Development +$37,256,000**
• Continue Kansas City Plant (KCP) manufacturing process development for welding processes, machining for multiple components, electrical/electronic fabrication processes, etc. • Continue KCP characterization of production processes for all military characteristics and subassemblies. • Continue KCP radar component maturation. • Initiate advanced fireset component development project at KCP. • Initiate KCP advanced material development of Direct Ink Write technology. • Initiate Lawrence Livermore National Laboratory (LLNL) developmental insensitive high explosives (IHE) production (TATB and PBX-9502) and qualification activities. • Continue Sandia National Laboratories (SNL) neutron generator tester development. Complete qualification engineering release on one tester. • Initiate SNL heterojunction bipolar transistor (HBT) process development. • Continue Savannah River National Laboratory (SRNL) process development for aluminum gas transfer system (GTS) and advanced materials. • Initiate Y-12 National Security Complex (Y-12) nuclear explosive package work for the canned subassembly (CSA) screening process. • Initiate technical design, development, qualification, and production of new GTS test valves coordinated among LANL, KCP, SNL, and SRNL.	• Continue Kansas City Plant (KCP) development of electrical component assemblies for the radar. • Continue KCP upgrades to major component assemblies associated with arming, fuzing, and firing functions. • Continue KCP development of production machining and assembly for gas transfer systems (GTS). • Continue KCP advanced material development of Direct Ink Write technology. • Initiate KCP development of capability or work associated with arming, fuzing, and firing for advanced fireset, manufacturing inspection and test, mechanism development, microelectronic development, initiation system readiness, data management, optical switch, and trusted and secure manufacturing. • Initiate Lawrence Livermore National Laboratory (LLNL) advanced manufacturing work in support of reuse, refurbishment, and/or replacement of pit components. • Continue LLNL developmental insensitive high explosives (IHE) production (TATB and PBX-9502) and qualification activities. • Initiate Pantex Plant (PX) work associated with the nuclear explosion package such as radiography, extrudables, explosive loading capability, load charge housing, test fire capabilities, pit reuse workstation, PBX 9502 vendor qualification, Integrated Pump-Down and Fill Station (IPFS), and annealed pit tubes.	• The increase reflects investments necessary to sustain manufacturing capabilities nearing end-of-life at Sandia National Laboratory (SNL), Los Alamos National Laboratory (LANL), and Savannah River National Laboratory (SRNL), as well as begin technology maturation work associated with the cruise missile warhead Life Extension Program.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
• Initiate advanced initiation systems manufacturability studies at LANL and KCP.	• Continue Sandia National Laboratories (SNL) limited life component work regarding advanced materials development and aluminum vessels for tritium service. • Continue SNL neutron generator tester development. • Continue SNL upgrades to gas transfer and neutron generator subsystems. • Continue SNL heterojunction bipolar transistor (HBT) process development. • Continue Savannah River National Laboratory (SRNL) limited life component work regarding advanced materials development and aluminum vessels for tritium service. • Continue SRNL development of reservoir filling and testing processes for new GTS designs. • Continue Y-12 National Security Complex (Y-12) nuclear explosive package work for the canned subassembly (CSA) screening process. • Initiate Y-12 diagnostic capabilities and upgrades related to digital radiography, dimensional inspections, and metal component certification. • Initiate Y-12 ability to certify diagnostic equipment and upgrade manufacturing capabilities. • Continue technical design, development, qualification, and production of new GTS test valves coordinated among LANL, KCP, SNL, and SRNL. • Continue advanced initiation systems manufacturability studies at LANL and KCP.	

Advanced Manufacturing Development
Process Technology Development

Description

The Process Technology Development subprogram supports the development, demonstration, and utilization of new production technologies to enhance nuclear manufacturing capabilities for nuclear weapon materials. This subprogram ensures new technologies with the potential to shorten production schedules, reduce risks, or enhance personnel safety by having a dedicated funding source to reach optimal levels of maturity without competing with other programmatic priorities. Presently, the subprogram is focused on uranium processing technology, specifically by acquiring major items of equipment for the Y-12 National Security Complex (Y-12).

The purpose of this subprogram is to fund major items of equipment (MIE) in support of ceasing enriched uranium programmatic operations in Building 9212 at Y-12 by 2025. The MIE include calciner, electro-refiner, direct electrolytic reduction, and machine chip processing.

Additional work related to the Uranium Strategy and ceasing enriched uranium programmatic operations in Building 9212 by 2025 is described in a new budget line, Uranium Sustainment within Nuclear Material Commodities, under Directed Stockpile Work.

FY 2017 – FY 2020 Key Milestones

- Accelerate the electro-refiner MIE in support of a FY 2020 completion.
- Accelerate the calciner MIE in support of a FY 2021 completion.
- Refine the scope for the direct electrolytic reduction and machine chip processing MIE.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Process Technology Development $19,600,000	**Process Technology Development $17,800,000**	**Process Technology Development -$1,800,000**
• The Process Technology Development subprogram funds two major items of equipment, (MIE) in support of ceasing enriched uranium programmatic operations in Building 9212 at Y-12 by 2025: - Calciner – a rotary drum calciner will stop the practice of recovering low equity EU materials by segregating salvage and accountability functions so they no longer go through purification. - Electro-refiner – an electrically-based chemical purification system to provide a replacement capability for current aqueous-based process.	• Continues to support three MIE: - Calciner – a rotary drum calciner will stop the practice of recovering low equity EU materials by segregating salvage and accountability functions so they no longer go through purification. - Electro-refiner – an electrically-based chemical purification system to provide a replacement capability for current aqueous-based process. - Machine Chip Processing –the recovery of EU machine tool turnings for subsequent reuse in manufacturing processes.	• The decrease in funding reflects the deferral of Direct Electrolytic Reduction project while focusing available funding on continuing the acceleration of Calciner and Electro-refiner projects, and initial efforts for the Chip Processing MIE. These latter projects support stopping the enriched uranium programmatic operations in Building 9212 at the Y-12 National Security Complex by 2025.

Advanced Manufacturing Development
Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY2020
Component Manufacturing Development - The annual progress towards the maturation of production technologies and manufacturing capabilities as measured by the number of deliverables completed.							
Target	5 deliverables	6 deliverables	5 deliverables	6 deliverables	5 deliverables	5 deliverables	5 deliverables
Result	5						
Endpoint Target	The NNSA will continue to mature production technologies and manufacturing capabilities to support nuclear weapon refurbishment and assessment activities to support Directed Stockpile Work. Note: in FY 2014 this work was accomplished in the Readiness Campaign under the Non-Nuclear Readiness subprogram.						

Advanced Manufacturing Development
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	172,600	0	2,400	2,400	19,600	17,800	-1,800
Plant Projects (GPP) (<$10M)	0	0	0	0	0	0	0
Total, Capital Operating Expenses	**172,600**	**0**	**2,400**	**2,400**	**19,600**	**17,800**	**-1,800**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)							
Calciner, Y-12	45,800	0	0	0	11,800	8,500	-3,300
Machine Chip Processing, Y-12	19,800	0	0	0	0	1,500	+1,500
Electrorefiners, Y-12	58,000	0	2,400	2,400	7,800	7,800	0
Direct Electrolytic Reduction, Y-12	49,000	0	0	0	0	0	0
Total, Capital Equipment (including MIE)	**172,600**	**0**	**2,400**	**2,400**	**19,600**	**17,800**	**-1,800**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**172,600**	**0**	**2,400**	**2,400**	**19,600**	**17,800**	**-1,800**

Outyears for Advanced Manufacturing Development

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	19,600	22,100	28,200	28,700
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**19,600**	**22,100**	**28,200**	**28,700**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)				
Calciner, Y-12	8,500	8,500	8,500	0
Machine Chip Processing, Y-12	3,300	5,000	5,000	5,000
Electrorefiners, Y-12	7,800	8,600	14,700	8,900
Direct Electrolytic Reduction, Y-12	0	0	0	14,800
Total Non-MIE Capital Equipment (>$500K)	**0**	**0**	**0**	**0**
Total, Capital Equipment (including MIE)	**19,600**	**22,100**	**28,200**	**28,700**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**19,600**	**22,100**	**28,200**	**28,700**

Readiness in Technical Base and Facilities

Overview

The Readiness in Technical Base and Facilities (RTBF) program provides program capabilities and Special Nuclear Materials (SNM) infrastructure for the nuclear security enterprise. The program ensures that essential capabilities are available and compliant with regulatory requirements for safe, secure execution of the nuclear security mission. The RTBF program supports the nuclear security missions, which include nuclear weapons, non-proliferation, and naval reactors activities at the eight NNSA sites: three national weapons laboratories, four production sites, and the Nevada National Security Site. The RTBF program provides a defined level of readiness and capabilities through infrastructure investments and strategy development for SNM processing and inventory management. RTBF also plans, prioritizes, and constructs state-of-the-art facilities, infrastructure, and scientific tools for the enterprise within approved baseline costs and schedules. The RTBF program accomplishes this mission by the modernization of NNSA infrastructure through recapitalization, capability investments, strategic planning, and line-item construction projects for the enhancement of capabilities. Capability investments are not dedicated to a single program or weapon system and strategic planning supports the initial development and viability analysis of cost-effective solutions for technical base. The program is responsible for developing and implementing technology improvements and functionality, as well as planning, prioritizing, and supplying required quantities of materials by recycling, recovering, and storing nuclear and select non-nuclear program material. Finally, the program also develops and executes strategies for operations and sustaining program skills through personnel training and development.

In order to more clearly communicate spending priorities and decisions, a portion of scope and funding from the RTBF program has been transferred to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit, starting in FY 2016. The core programmatic activities and mission capabilities will remain in the RTBF program. The Operations of Facilities, Containers, Maintenance and Repair, and a portion of the Recapitalization subprograms, as well as Infrastructure related line-item construction projects were transferred from the RTBF program. In addition, the Nuclear Criticality Safety Program (NCSP) and Nuclear Safety Research and Development (NSR&D) activities within the Program Readiness subprogram has also been transferred to the Infrastructure and Safety program.

Readiness in Technical Base and Facilities
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Readiness in Technical Base and Facilities [a]					
Operating					
Operations of Facilities					
Kansas City Plant	135,834	135,502	125,000	0	-125,000
Lawrence Livermore National Laboratory	77,287	76,367	71,000	0	-71,000
Los Alamos National Laboratory	213,707	213,707	198,000	0	-198,000
Nevada National Security Site	100,929	99,953	89,000	0	-89,000
Pantex Plant	81,420	79,334	75,000	0	-75,000
Sandia National Laboratory	115,000	119,500	106,000	0	-106,000
Savannah River Site	90,236	90,236	81,000	0	-81,000
Y-12 National Security Complex	170,042	165,887	151,000	0	-151,000
Total, Operations of Facilities	**984,455**	**980,486**	**896,000**	**0**	**-896,000**
Program Readiness	67,259	67,234	68,000	75,185	+7,185
Material Recycle and Recovery	125,000	120,154	126,000	173,859	+47,859
Containers	26,000	25,416	26,000	0	-26,000
Storage	35,000	34,878	40,800	40,920	+120
Maintenance and Repair of Facilities	227,591	232,591	227,000	0	-227,000
Recapitalization	180,000	180,000	224,600	104,327	-120,273
Total, Operating	**1,645,305**	**1,640,759**	**1,608,400**	**394,291**	**-1,214,109**
Construction	**422,120**	**419,620**	**425,000**	**660,190**	**+235,190**
Total, Readiness in Technical Base and Facilities [a]	**2,067,425**	**2,060,379**	**2,033,400**	**1,054,481**	**-978,919**

[a] A portion of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit, starting in FY 2016.

Readiness in Technical Base and Facilities
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Readiness in Technical Base and Facilities				
Operating				
Program Readiness	42,259	42,234	49,759	75,185
Material Recycle and Recovery	122,600	117,754	126,000	173,859
Storage	28,400	28,278	33,400	40,920
Recapitalization	28,500	28,500	55,800	104,327
Total, Operating	**221,759**	**216,766**	**264,959**	**394,291**
Construction	**422,120**	**419,620**	**423,000**	**660,190**
Total, Readiness in Technical Base and Facilities	**643,879**	**636,386**	**687,959**	**1,054,481**

Outyears for Readiness in Technical Base and Facilities
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Readiness in Technical Base and Facilities				
Operating				
Program Readiness	75,185	77,218	77,218	77,218
Material Recycle and Recovery	144,679	145,326	141,644	146,118
Storage	37,253	39,122	38,200	41,001
Recapitalization	111,322	101,689	119,059	110,732
Total, Operating	**368,439**	**363,355**	**376,121**	**375,069**
Construction	**752,939**	**843,935**	**908,917**	**860,370**
Total, Readiness in Technical Base and Facilities	**1,121,378**	**1,207,290**	**1,285,038**	**1,235,439**

Budget Structure Changes

In FY 2016, Operations of Facilities, Containers, Maintenance and Repair of Facilities, and a portion of Program Readiness, Recapitalization and Construction will be transferred to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. The following core programmatic activities and mission capabilities will remain in the RTBF funding structure.

Comparability Matrix
(Dollars in Thousands)

	FY 2016 Budget Structure					
	Weapons Activities Readiness in Technical Base and Facilities					
	Program Readiness	Material Recycle and Recovery	Storage	Recapitalization	Construction	Total
FY 2015 Budget Structure						
Weapons Activities						
Readiness in Technical Base and Facilities						
Operating						0
Operations of Facilities						0
Kansas City Plant						0
Lawrence Livermore National Laboratory						0
Los Alamos National Laboratory						0
Nevada National Security Site						0
Pantex						0
Sandia National Laboratory						0
Savannah River Site						0
Y-12 National Security Complex						0
Total, Operations of Facilities						0
Program Readiness	75,185					75,185
Material Recycle and Recovery		173,859				173,859
Containers						0
Storage			40,920			40,920
Maintenance and Repair of Facilities						0
Recapitalization				104,327		104,327
Total, Operating						394,291
RTBF: Construction					660,190	660,190
Total Weapons Activities	**75,185**	**173,859**	**40,920**	**104,327**	**660,190**	**1,054,481**

Readiness in Technical Base and Facilities
Explanation of Major Changes
(Comparable)
(Dollars in Thousands)

	FY 2016 vs FY 2015
Program Readiness: Increases in Program Readiness allow expansion of programs to recruit and retain critical skills throughout the enterprise. Increased funding at the Livermore National Laboratory (LLNL), Nevada National Security Site (NNSS), National Security Complex, Y-12, Pantex, and Los Alamos National Laboratory (LANL) expands initial efforts to correct retirement and attrition losses for skilled workers across the sites, and to sustain and ramp up capabilities to support the current Life Extension Programs (LEPs), and upcoming LRSO and Interoperable Warheads. Funding supports LANL and LLNL to digitize and catalog the records from atomic testing to ensure the founding database of the nuclear stockpile is backed-up and the data can be effectively accessed by proper authorities to answer expanding questions of the science behind nuclear weapons performance. Funding will also enhance cross enterprise planning, and development of strategies for additional commodities and capabilities beyond the three currently identified commodities.	**+25,426**
Material Recycle and Recovery (MRR): Increases in MRR supports the processing of enriched uranium material to be moved from Area 5, including Y-12's Building 9212 de-inventory, to the Highly Enriched Uranium Materials Facility (HEUMF). This allows for reduction of material at risk in Building 9212 in preparatory for the transition to the Uranium Processing Facility (UPF) and most substantively, to re-establish a purified depleted uranium supply to meet stockpile demand. For Nuclear Weapons stockpile and Life Extension Program needs, MRR must begin to re-establish a purified depleted uranium feedstock supply capability, while supporting base accountability and salvage operations that feed High Enriched Uranium (HEU) purification and production. Specifically, approximately $31.3 million of the increase will directly support re-establishing the capability to convert existing supplies of DUF6 to DUF4. The increase will also support the continued sustainment and recapitalization of tritium processing systems at the Savannah River Site (SRS), including component and equipment replacement designed to reduce operational risks associated with operation of equipment beyond the intended process design life; and a reduction of material-at-risk at the LANL PF-4 Vault, and Chemistry and Metallurgy Research (CMR) de-inventory.	**+47,859**
Storage: Increases in Storage supports the completion of the installation of a second Major Item of Equipment (MIE), the CoLOSSIS High Resolution Computed Tomography system (to eliminate single point failure for this critical capability), and recapitalization component procurements supporting the existing CoLOSSIS I to meet pit storage surveillance requirements at Pantex. Funding also supports a new Storage program at LANL for the SAVY-4000 onsite container certification, surveillance, testing and procurement and will continue to be in compliant with container requirements (DOE Manual 441.1-1). In addition, there is a transfer of scope for specific acceleration of Area 5 De-inventory to the Uranium Sustainment subprogram under the Nuclear Material Commodities program within Directed Stockpile Work (DSW).	**+7,520**
Recapitalization: Increases in Recapitalization are mainly due to two factors: 1) **s**tarting in FY 2016, RTBF Recapitalization will also fund other project costs (OPCs) for Defense Programs' line item construction projects that revitalize the nuclear security enterprise's weapons manufacturing and research and development infrastructure (+$23.4 million); and 2) funding for the Sandia Silicon Fabrication Revitalization project (+$20 million). Other Capabilities Based Investments (CBI) activities supported in Recapitalization include: continued investments in equipment to support warhead assessment, surveillance and Insensitive High Explosives (IHE) capabilities at LLNL; subcritical experiments in the Device Assembly Facility and U1A	**+48,527**

	FY 2016 vs FY 2015
NNSS; lithium material manufacturing capabilities at Y-12; execution of projects at LANL to improve environmental testing capabilities in support of the B61; work stations, tools, and diagnostic equipment to support LEPs and surveillance work at Pantex; and investments in gas transfer operations at SRS.	
Construction: The increase is due to significant increases in the Uranium Processing Facility (UPF) at Y-12 and the Chemistry and Metallurgy Research Replacement (CMRR) Project at LANL as described below.	**+237,190**
For UPF, the project is planning for a different strategy than previously reported. Consistent with the recommendations of the April 2014 Peer Review led by Dr. Thom Mason of Oak Ridge National Laboratory (ORNL), the strategy to cease programmatic operations in building 9212 by FY 2025 for no more than $6.5 billion will consist of maximizing the use of existing facilities at Y-12, while constructing new buildings only for those operations which are not appropriate to be relocated into other existing structures. Therefore, UPF will no longer be a single big box facility, but rather will be a series of smaller, segregated facilities designed and constructed to individual safety and security criteria, commensurate to the protection of the unit operation contained within it. The Administrator has created a new position, the Uranium Program Manager (UPM), who is guiding future UPF investments using a strategy consistent with the April 2014 Peer Review. The strategy provides a more consistent annual funding profile for Enriched Uranium (EU) investments, balanced between the delivery of new build facilities and reduction of risk in ongoing operations. The UPM has the authority and responsibility to balance the funding stream investments across the EU enterprise.	
For the CMRR Project, the Nuclear Weapons Council has endorsed the NNSA Plutonium Strategy comprised of three steps to provide analytical chemistry (AC) and materials characterization (MC) capabilities as well as address the lifetime of the Plutonium Facility (PF)-4. The first two steps provide for continuity in AC and MC capabilities by optimizing the use of the Radiological Laboratory/Utility/Office Building (RLUOB) and repurposing space in PF-4; these steps are reflected in the CMRR project data sheet (04-D-125) as two new subprojects – RLUOB Equipment Installation Phase 2 (REI2) and PF-4 Equipment Installation (PEI).	
Total, Readiness in Technical Base and Facilities	**+366,522**

Readiness in Technical Base and Facilities
Operations of Facilities

Description

The Operations of Facilities subprogram supports the base operations costs at the nuclear security enterprise sites, which includes facility leases, labor, facility planning and management, utilities, general services, and emergency services. It also provides for costs associated with regulatory compliance and environment, safety, health and quality. The Operations of Facilities subprogram also funds waste management activities, including treatment, storage and waste disposition of both hazardous and radiological wastes. It provides for the daily operations, and staffing requirements, while providing activities associated with sustaining equipment, systems, facilities, or capabilities to meet design requirements and operating conditions consistent with mission requirements

The Operations of Facilities section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit, starting in FY 2016.

Description

Program Readiness (PR) implements a multi-year strategy to provide capabilities that support the needs of the nuclear security enterprise. Through PR, NNSA provides specific capabilities by developing and executing programmatic strategies to sustain and attract workforce critical skills, support the early science development of new cross cutting technologies, and support legacy commitments from nuclear testing. PR supports legacy commitments at the sites by protecting nuclear testing archives; conduct groundwater monitoring, air sampling, and bore hole closure; and provides limited funds to preserve the option to return to nuclear testing, if properly ordered.

The first area of PR funding develops and executes programmatic strategies. PR is supporting the development of Uranium, Tritium, and Plutonium Commodity Strategies, and will help to inform Lithium and High Explosive infrastructure Strategies. These strategies focus on ensuring NNSA has the capabilities to support the enduring stockpile regardless of the physical buildings that are used. Strategic planning facilitates early research into solutions to produce the most cost effective solutions to technical, material, personnel, and logistics issues. It also seeks to maximize internal resource utilization across the entirety of the nuclear weapons complex and reduce uncertainty before committing major investments into solutions.

The second focus area of PR funding supports the advancement of new technology and Advanced Manufacturing Initiatives. Specifically, PR funding is used to support the early development of technologies before they are inserted into programs. PR funding is also used to study how modern machining techniques can be applied to lithium part production as part of Advanced Manufacturing Initiatives. This area is executed in coordination with other Defense Programs to ensure scope is clearly defined within specific lanes to avoid overlap. This focus area plays heavily into the next focus area by leveraging utilization of critical skills to resolve programmatic needs at a basic science and engineering level.

The third focus area of PR funding is used to maintain and attract critical skill personnel capabilities by providing a trained, qualified, and skilled workforce. PR does this by maintaining the skills of workers, retaining workers and limiting attrition, and preparing the next generation. The relatively remote location of NNSA sites sometimes makes it difficult to attract and retain a qualified workforce. PR funding is used to support training and development opportunities to show the benefits of a career with the nuclear security enterprise. NNSA has long acknowledged the risks posed by an aging workforce. At Sandia National Laboratories, the Weapons Intern Program helps mitigate that risk by ensuring the nuclear weaponeers who designed the current stockpile have the opportunity to help train their replacements and share their unique knowledge and insights.

Finally, PR funds general and non-nuclear test readiness through advanced scientific and technology development and preparedness to perform a nuclear test should the President deem it necessary. PR funding supports legacy commitments at the site by maintaining the Nuclear Testing Archive, and funding groundwater protection programs, as well as seismic monitors.

The Nuclear Weapons Council has endorsed the NNSA Plutonium Strategy comprised of three steps to provide analytical chemistry (AC) and materials characterization (MC) capabilities as well as address the lifetime of the Plutonium Facility (PF-4) and future pit production needs. The first two steps provide for continuity in AC and MC capabilities by optimizing the use of the Radiological Laboratory/Utility/Office Building (RLUOB) and repurposing space in PF-4; these steps are reflected in the Chemistry and Metallurgy Research Replacement (CMRR) project data sheet (04-D-125) as two new subprojects – RLUOB Equipment Installation Phase 2 (REI2) and PF-4 Equipment Installation (PEI). The third step of the plutonium strategy extends the lifetime of PF-4 and supports increases in pit production capacity beyond 30 pits per year by proposing to build new modular facilities and move selected processes into new space. Program Readiness provides early funding for the modular concept as it matures into a new line item by enabling development of CD-0 and CD-1 documentation. The NNSA is planning to construct not less than two modular structures that will achieve full operating capability not later than 2027.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Program Readiness $49,759,000	**Program Readiness $75,185,000**	**Program Readiness +$25,426,000**
• Modernize programmatic capabilities that support the current and future stockpile. Scope will develop and execute programmatic strategies, support development of new capabilities, and sustain and expand critical program skills. Specific scope includes: o Install additional equipment to optimize the use of RLUOB. Conduct the planning study for PF-4 space re-configuration and broaden the analysis of AC and MC capabilities. o Managing the continuity of uranium and lithium processing capabilities during the transition out of building 9212 at Y-12. Invest in R&D for new depleted uranium and lithium technology, including critical skill development, and increased scope for planning and development of new manufacturing techniques in lithium processing. o Establishment and execution of a long-range implementation plan for tritium investments at SRS and an architecture for consolidating the GTS/Tritium enterprise to enhance the reliability of the tritium capability, and increase support for developing critical program skills in the engineering and operator pipeline. o Support modernization of manufacturing	• Continues to modernize programmatic capabilities that support the current and future stockpile. Scope will develop and execute programmatic strategies, support development of new capabilities, and sustain and expand critical program skills. Specific scope includes: o Managing the continuity of uranium and lithium processing capabilities during the transition out of Building 9212 at Y-12. Invest in R&D for new depleted uranium and lithium technology, including critical skill development, and increased scope for planning and development of new manufacturing techniques in lithium processing. o Establishment and execution of a long-range implementation plan for tritium investments at SRS and an architecture for consolidating the GTS/Tritium enterprise to enhance the reliability of the tritium capability, and increase support for developing critical program skills in the engineering and operator pipeline. o Establishment and execution of a long-range implementation plan for high explosives investments to reduce risks to the production of explosives for future LEPs. o Complete study to modernize manufacturing	• Implementation of a more balanced approach across all eight sites to ensure capability readiness. • Develop complex wide strategy to reduce risks to production of high explosives for future LEPs • Broadens support for critical skills in tritium at SRS to maintain skilled operators and engineers. • Expand efforts to link fundamental science projects to programmatic needs to sustain critical skills currency and attract new talent in the technical base across the complex. • Use experience developing commodity strategies to develop strategies for lithium, high explosives and other grouping of materials, expertise, for capabilities to reduce redundancy and unneeded capacity throughout the enterprise. • The transfer of funding into the CMRR line item for REI2 and PEI moved most of the FY 2015 plutonium strategy scope out of Program Readiness. The remaining scope is strategic planning for the plutonium strategy modular concept funded in FY 2016, consistent with commitments to the Department of Defense and Congress.

[a] The Nuclear Criticality Safety Program and Nuclear Safety Research and Development activities were previously performed under Program Readiness in FY 2015. In FY 2016, these activities are now included under the Safety Operations subprogram within the Infrastructure and Safety program in order to strengthen the program effectiveness by realigning similar programs and activities. The FY 2015 activities and funding are shown here in a comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
capabilities planning at LLNL through planning for LEP and warhead assessment procurement programs. Digitize and back-up irreplaceable nuclear testing archive data, which is a component of certifying the current stockpile. o At NNSS, maintain critical skills in vital weapons engineering disciplines, including experimental support for laboratories. o Conduct planning at PX for modernizing programmatic equipment for future LEPs, and develop critical program skills in support of weapon assembly and disassembly capabilities. • At SNL, conduct R&D projects for new technologies in support of LEP and stockpile modernization. Develop critical program skills in experimental operations in radiography and research for pulsed power alternatives. • The Plutonium Strategy (modules) is receiving funding in FY 2015 under Program Readiness.	capabilities plan at LLNL through planning for LEP and warhead assessment procurement programs. Expand critical skills efforts in the areas of radiography, radiochemistry, and neutron sciences. o At NNSS, maintain critical skills in vital weapons engineering disciplines, including experimental support for laboratories. o Conduct planning at Pantex for modernizing programmatic equipment for future LEPs, and develop critical program skills in support of weapon assembly and disassembly capabilities. o At SNL, conduct R&D projects for new technologies in support of LEP and stockpile modernization. Develop critical program skills in experimental operations in radiography and research for pulsed power alternatives. • Plutonium Strategy (modules) funds the development of early project documentation and pre-conceptual planning for the modular concept. **FY 2017-FY 2020** • Out-year funding supports continued investments in strategies, personnel, and planning for modernization of Defense Programs science and manufacturing capabilities. Focus will be on the continuity of plutonium chemistry and metallurgy during the transition out of CMR at LANL, and reducing the risks in tritium, lithium and high explosive (HE) capabilities, and unique technologies at SNL and NNSS in support of stockpile stewardship activities. • Continued support of vital program skills across the complex will be expanded. Critical skills and early technology development will continue to be closely linked in providing exercise of the skills	

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	base from science and engineering to testing, to manufacturing skills. Additionally, challenging and interesting work attracts and retains skilled personnel most effectively. • As the Plutonium Strategy (modules) project matures and reaches the appropriate critical decisions, funding in this subprogram may be transitioned into new a line item to reduce risk in PF-4 and support increased production demand by constructing new space.	

Readiness in Technical Base and Facilities
Material Recycle and Recovery

Description

The RTBF Material Recycle and Recovery (MRR) subprogram provides recycling and recovery of plutonium, enriched uranium, lithium and tritium. The recycle and recovery of material is from the fabrication and assembly operations, limited life components (LLC), and dismantlement of weapons and components. It also includes re-establishment of a purified deleted uranium supply.

At Y-12, these activities support the implementation of new as well as improved processes for fabrication and recovery operations, material stabilization, conversion, and interim storage. Material Recycle and Recovery activities for Defense Programs at Y-12 are aligned to support the W76-1 LEP production and planned future LEPs. All other uranium related mission work is supported by the MRR funding and includes the accountability and salvage processes. The purified metal production capability is needed for supply chains supporting LEPs as well as the Naval Reactors missions. Material Recycle and Recovery also supports the re-establishment of a capability to supply high purity depleted uranium feedstock.

At LANL, MRR provides for activities in the Chemistry and Metallurgy Research (CMR) de-inventory effort, the Confinement Vessel Disposition project, and the PF-4 vault de-inventory in order to consolidate and disposition excess materials, free up space for program needs, and reduce nuclear safety risk and personnel radiological exposure.

At SRS, MRR provides funding to support the staff and program equipment necessary for the recovery of tritium supporting Limited Life Components (LLCs). This includes recapitalization efforts to reduce operational risk incurred by utilizing equipment beyond its intended design life.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Material Recycle and Recovery $126,000,000	**Material Recycle and Recovery $173,859,000**	**Material Recycle and Recovery +$47,859,000**
• Provides for recycling and recovery of plutonium, enriched uranium, lithium and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and nuclear components. • Implements new or improved processes for fabrication and recovery operations, material stabilization, conversion, and in-process storage. • Recycles and purifies materials to meet specifications for safe, secure, and environmentally acceptable storage, and to meet the directive schedule for tritium reservoir refills, and to support the increased workload associated with LEP production rates, additional weapon surveillance activities, increased piece part disassembly's and increases in Research, Development, Test and Evaluation (RDT&E) program activities and Sustainment work in the nuclear facilities. o At LANL, activities include accelerated material stabilization, repackaging, and excess materials management to de-inventory PF-4 vault, nuclear materials information management, the Special Recovery Line, Confinement Vessel Disposition, CMR de-inventory, and nuclear materials planning and reporting. Accelerated vault de-inventory reduces nuclear safety risks and supports current and future needs for material storage associated with Pu^{238} operations, DSW, RTD&E program activities and other defense program missions in PF-4. Vault activities include assay, storage, packaging, transportation and waste disposal,	• Continues to provide for recycling and recovery of plutonium, enriched uranium, lithium and tritium from fabrication and assembly operations, limited life components, dismantlement of weapons and nuclear components and re-establishes a purified depleted uranium supply. • Implements new or improved processes for fabrication and recovery operations, material stabilization, conversion, and in-process storage. • Recycles and purifies materials to meet specifications for safe, secure, and environmentally acceptable storage, and to meet the directive schedule for tritium reservoir refills, and to support the increased workload associated with LEP production rates, additional weapon surveillance activities, increased piece part disassembly's and increases in Campaign and Sustainment work in the nuclear facilities. o At LANL, activities include accelerated material stabilization, repackaging, and excess materials management to de-inventory PF-4 vault, nuclear materials information management, Special Recovery Line work, Confinement Vessel Disposition, CMR de-inventory, and nuclear materials planning and reporting. Accelerated vault de-inventory reduces nuclear safety risks and supports current and future needs for material storage associated with Pu^{238} and Pu^{239} operations, DSW, RDT&E program activities and other defense program missions in PF-4. Vault activities include assay, storage, packaging, transportation and waste disposal. Alternatives for processing and	• CMR vault de-inventory scope increased in FY 2016 to accelerate the de-inventory process. The vault de-inventory scope begins to wind down in FY 2020. • Y-12 funding supports the W76 LEP schedule, future inventory requirements, and processing materials to assist in de-inventory. In addition, the uplift includes funding for the effort to re-establish capability for supplying high purity depleted uranium feedstock in the amount of approximately $31.3million. • Additional funding for SRS reduces the backlog of maintenance on gas processing systems and recapitalizes program equipment that is currently operating beyond its intended life.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
as well as alternatives for processing and storage of LANL materials at Y-12, SRS, and NNSS will also be evaluated and optimized. Recovery of the schedule lost due to the PF-4 programmatic pause of 2013 will continue through FY2015 o At the SRS Tritium Extraction Facility, activities include recovery and purification of tritium, deuterium, and helium-3 gases from reservoir recycle gas, hydride storage vessels, and facility effluent cleanup systems. Gas mixtures are enriched to support the DSW schedules. • At Y-12, activities include uranium purification and conversion to UO_3, acid removal and waste processing, conversion of enriched uranium oxide to metal buttons, material transport and storage, and processing enriched uranium chips and scraps, as well as lithium salvage operations. MRR also funds the Central Scrap Management Office that manages the receipt, storage, and shipment of enriched uranium scrap and the Precious Metals Business Center that provides a cost-effective service to many users within the DOE complex.	storage of LANL materials at Y-12, SRS, and NNSS will also be evaluated and optimized. Recovery of the schedule lost due to the PF-4 programmatic pause of 2013 will continue through FY2015 and, as necessary, in FY 2016. o At the SRS Tritium Extraction Facility, activities include recovery and purification of tritium, deuterium, and helium-3 gases from reservoir recycle gas, hydride storage vessels, and facility effluent cleanup systems. Gas mixtures are enriched to support the DSW schedules. o At Y-12, activities include uranium purification and conversion to UO_3, waste processing, conversion of enriched uranium oxide to metal buttons, material transport and storage, and processing enriched uranium chips and scraps, and lithium salvage operations. Increased production of purified metal and material processing will be necessary to support de-inventory and facilitate transition goals. MRR also funds the Central Scrap Management Office that manages the receipt, storage, and shipment of enriched uranium scrap and the Precious Metals Business Center that provides a cost-effective service to many users within the DOE complex. In addition, MRR scope will be increased to provide for high purity depleted uranium feedstock. Specifically, FY 2016 funding supports the effort to re-establish the capability for conversion of DUF_6 to DUF_4 for high purity depleted uranium feedstock and will, therefore, require a significant funding adjustment from FY 2015. Approximately $31.3million is being designated for this effort.	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	FY 2017-FY 2020 • Provides base capability and capacity across production plants and national laboratories for recycling and recovery of plutonium, uranium, lithium, tritium and other materials consistent with the Stockpile Stewardship Management Plan (SSMP) and Production and Planning Directive (P&PD). Y-12 capacity will be challenged as increased emphasis is placed on Building 9212 de-inventory efforts and as Y-12 continues to re-establish a capability to supply a purified depleted uranium for future stockpile needs. • Recover schedule lost for LANL's vault de-inventory and chemical processing due to the programmatic pause of 2013. Material processing capability is needed to meet significant de-inventory commitments for the CMR by 2019. • SRS will continue recapitalization of program equipment components to bring operational equipment back to function within intended design life.	

Description

The Containers subprogram funds off-site shipping container research and development, design, certification, re-certification, test and evaluation, production and procurement, fielding and maintenance, decontamination and disposal, and off-site transportation authorization of shipping containers for nuclear materials and components supporting both the nuclear weapons program and nuclear materials consolidation. These efforts include efficiencies achieved by close coordination of planning and operations with users and customers.

The Containers section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016.

Description

The RTBF Storage subprogram provides effective storage and management of pits, plutonium, enriched and depleted uranium, lithium, tritium, heavy water, weapons components and other materials. The Storage subprogram includes onsite SAVY-4000 storage container certification, surveillance and testing at LANL; pit surveillance for safe storage, long-term storage of special nuclear materials, and national security inventory thermal monitoring and characterizations at Pantex. It also includes management and storage of nuclear materials, the long-term planning and analysis of materials required for the Y-12 manufacturing strategy in support of the nuclear weapons stockpile. The Storage subprogram is also an integral part of the de-inventory supply chain at Y-12 and LANL. Funding for the de-inventory of Area 5 was moved to the Uranium Sustainment subprogram under the Nuclear Materials Commodities program within DSW.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Storage $33,400,000	**Storage $40,920,000**	**Storage +$7,520,000**
• Funding provides for effective storage and management of pits, High Enriched Uranium (HEU), and other weapons nuclear and non-nuclear materials. Includes: receipt, storage, and inventory of nuclear materials, non-nuclear materials, HEU, enriched lithium, and components from dismantled warheads. o At LANL, activities include onsite SAVY-4000 storage container certification, surveillance, testing and procurements. o At Pantex, activities include long-term storage of special nuclear materials, which involved planning, engineering, design, and start-up activities; processing and repackaging materials for safe storage; storage activities for the strategic reserve; national security inventory thermal monitoring and characterizations; disposition of legacy materials; and nuclear materials management, including planning, assessment, and forecasting nuclear material requirements. Funding includes pit surveillance and provides for the procurement and installation of the second High Resolution Computed Tomography capability. o At Y-12, activities include the management and storage of uranium, lithium, and other nuclear and weapons materials, including the nation's strategic reserve of HEU. The Storage subprogram supports the loading, operating, and maintaining of HEU Materials Facility. This subprogram also provides the	• Continues to provide for effective storage and management of pits, HEU, and other weapons nuclear and non-nuclear materials. Includes: receipt, storage, and inventory of nuclear materials, non-nuclear materials, HEU, depleted uranium and lithium. o At LANL, activities include onsite SAVY-4000 storage container certification, surveillance, testing and procurements. o At Pantex, activities include long-term storage of special nuclear materials, which involve planning, engineering, design, and start-up activities; processing and repackaging materials for safe storage; storage activities for the strategic reserve; national security inventory thermal monitoring and characterizations; disposition of legacy materials; and nuclear materials management, including planning, assessment, and forecasting nuclear material requirements. Funding includes pit surveillance and provides for installation of the second High Resolution Computed Tomography capability (CoLOSSIS II). o At Y-12, activities include the management and storage of uranium, lithium, and other nuclear and weapons materials, including the nation's strategic reserve of HEU. The Storage subprogram supports the loading, operating, and maintaining of HEU Materials Facility. This subprogram also provides the long-term planning and analysis of materials required for the Y-12 manufacturing strategy	• Completion of the installation of a second Major Item of Equipment (MIE), the CoLOSSIS High Resolution Computed Tomography system (to eliminate single point failure for this critical capability), and recapitalization component procurements supporting the existing CoLOSSIS I to meet pit storage surveillance requirements at Pantex. • Supports a new Storage program at LANL for the SAVY-4000 onsite container certification, surveillance, testing and procurement. • In addition, there is a transfer of scope for specific acceleration of Area 5 De-inventory to the Uranium Sustainment subprogram under the Nuclear Material Commodities program within DSW.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
long-term planning and analysis of materials required for the Y-12 manufacturing strategy in support of the nuclear weapons stockpile. • Continues to support the emphasis on nuclear material consolidation and de-inventory activities across the nuclear enterprise.	in support of the nuclear weapons stockpile. • Continues to support the emphasis on nuclear material consolidation and de-inventory activities across the nuclear enterprise. **FY 2017-FY 2020** • Provides base capability and capacity across production plants and national laboratories for storage of plutonium, uranium, lithium, tritium and other materials consistent with SSMP and Production and Planning Directive (P&PD). • CoLOSSIS II is expected to be in operation in FY 2017 in which the refurbishment of CoLOSSIS I will begin. An increasing emphasis on de-inventory will persist through this period.	

Readiness in Technical Base and Facilities
Maintenance and Repair of Facilities

Description

The Maintenance and Repair of Facilities subprogram funds the direct funded maintenance activities at NNSA sites across the nuclear security enterprise. It supports costs for labor, materials, and supplies for corrective, preventive and predictive maintenance activities. Also, it includes costs to conduct required surveillances on vital safety systems, (e.g., air monitoring systems) and building support systems, (e.g., HVAC). This subprogram will deploy BUILDER management system to implement enterprise-wide, risk-informed investments in existing infrastructure. Maintenance prioritization will be based on mission needs, probability of failure of a system or a component and risk determination with regard to safety, security and environmental requirements. The investment strategy is to focus on those structures, systems, and components that are considered essential to the national security mission.

This subprogram will also fund roof replacement projects executed under the Roof Asset Management Program. It will allow NNSA to investigate and implement other enterprise-wide Asset Management Programs for which the strategic, centralized procurement of common equipment like roofs, chillers, and lighting would be more cost effective.

This section has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016.

Readiness in Technical Base and Facilities
Recapitalization

Description

The Recapitalization subprogram is an investment strategy for managing risks in existing infrastructure and capabilities by prioritizing investments to upgrade the aging NNSA nuclear security infrastructure and improve the reliability, efficiency, and capability of core infrastructure to meet Defense Programs (DP) requirements.

RTBF Recapitalization's primary purpose is a concentrated effort entitled Capabilities Based Investments (CBI). CBI implements multi-year projects and strategies to sustain, enhance or replace DP capabilities through focused investments supporting the core programmatic requirements across the enterprise. These investments address needs beyond any single facility, campaign, or weapon system and are essential to achieving program mission objectives. Over the years, DP's science and manufacturing capabilities have been lost or degraded due to aging, broken or outdated equipment and supporting systems. To support ongoing and future DP weapons activities, CBI invests in projects to reduce risk to the mission and ensure needed capabilities are available for Life Extension Programs (LEPs) and other mission work. CBI provides a corollary to NNSA's line-item construction by funding smaller projects to enhance or sustain critical DP capabilities across the enterprise. CBI projects include: minor construction projects, Capital Equipment Projects, and Expense Funded Projects.

RTBF Recapitalization also funds Other Project Costs (OPCs) for DP line-item projects in the Construction subprogram, which revitalizes the nuclear security enterprise, including the nuclear weapons manufacturing and research and development infrastructure.

In order to clearly communicate spending priorities and decisions, a portion of the RTBF Recapitalization subprogram that supports general infrastructure and not aligned to one specific mission has been transferred to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Recapitalization $55,800,000	**Recapitalization $104,327,000**	**Recapitalization +$48,527,000**
• Capabilities Based Investments continues to provide targeted, strategic investments for life-extension and modernization of enduring requirements needed to sustain DP's capabilities. CBI provides funding to implement projects across the nuclear security enterprise including continued investments to: support LEP assessment at LLNL, support B61 LEP environmental testing needs at LANL, and enable DP's mission across the enterprise. Additional FY 2015 projects include: o At NNSS, investments to modernize down-draft tables and radiography capabilities for sub-critical experiments. o At Pantex, vacuum chamber upgrades needed for programmatic deliverables. o At SNL, investments in silicon fabrication capabilities.	• CBI continues to provide targeted, strategic investments for life-extension and modernization of enduring requirements needed to sustain DP's capabilities. CBI provides funding to implement projects across the nuclear security enterprise including continued investments to: support LEP assessment at LLNL, support the B61 LEP environmental testing needs at LANL, revitalize silicon fabrication capabilities at SNL, and support DP's mission across the enterprise. Additional FY 2016 projects include: o At LLNL, investment in insensitive high explosive qualification capabilities. o At NNSS, equipment for subcritical experiments at the Device Assembly Facility. o At Pantex, investment in work stations, production tooling, and diagnostic equipment to support life extension activities. o At Y-12, investment in lithium material manufacturing capabilities. • RTBF Recapitalization will provide funding for Defense Programs' other project costs (OPCs) for line item Construction projects. **FY 2017-FY 2020** • Continues to provide targeted, strategic investments for life-extension and modernization of enduring requirements needed to sustain DP's	• Increases in CBI activities within Recapitalization from FY 2015 to FY 2016 reflect increased needs at each site to maintain Defense Programs' capabilities, and scope deferred from previous years across the enterprise. • Defense Programs' other project costs (OPCs) for Line Item Construction projects are included in RTBF Recapitalization starting in FY 2016. • Additionally, CBI has added scope to revitalize silicon fabrication capabilities at SNL.

[a] A portion of the Recapitalization subprogram that supports general infrastructure and not aligned to one specific mission was previously performed under RTBF Recapitalization in FY 2015. In FY 2016, these activities are now included under the Recapitalization subprogram within the Infrastructure and Safety program in order to strengthen the program effectiveness by realigning similar programs and activities. The FY 2015 activities and funding are shown here in a comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	capabilities. CBI will provide funding to implement projects across the nuclear security enterprise including continued investments to support projects initiated in previous fiscal years, including investments to support warhead assessments and Insensitive High Explosive capabilities at LLNL, B61 environmental testing capabilities at LANL, subcritical experiment support at NNSS, gas transfer systems at SRS, and investment in silicon fabrication revitalizations at SNL. • Continue funding of Defense Programs' other project costs (OPCs) for line item Construction projects. • Through the outyear funding profile (FYNSP), CBI will successfully manage and execute targeted capability investments across the enterprise by applying previously successful program management practices. Increases in program funding in FY2017 and beyond are consistent with feedback from field representatives regarding the need for capability investments at each site.	

TABLE 1			
FY 2016 Planning Dollars			
Site	**Planned Projects**	**Type of Project** (GPP, MIE, OPC, Operating)	**FY2016 Projected Funds** (in thousands)
Kansas City Plant	Development Laboratory Modernization	Operating	1,500
	Special Application Machining Modernization	Operating	1,000
Lawrence Livermore National Laboratory	LEP & Warhead Assessment Investments	Operating	8,000
	Insensitive Hi Explosives Qualification Capabilities Recap	Operating	4,000
Los Alamos National Laboratory	DP Line Item OPCs (6 projects)	OPC	17,300
	Environmental Testing Capability Investments (ARMAG)	GPP	2,000
	TA-55 Wet Vacuum Material Handling System	Operating	3,500
	DARHT Weather Enclosure	GPP	1,000
	DARHT Reliability/Capability Upgrades	Operating	1,200
Nevada National Security Site	U1a Sub-Critical Experiments Support Investments II	Operating	2,000
	DAF Sub-Critical Experiments Support	Operating	2,000
	Stockpile Stewardship Management Infrastructure	Operating	2,000
	JASPER Advanced Pu Experimental Capabilities	Operating	1,500
Pantex Plant	DP Line Item OPCs (3 projects)	OPC	2,100
	Pit Marking Station	Operating	400
	Special Nuclear Material Work Station	GPP	3,100
	Mass Properties Measurement Machine Replacement	MIE	3,200
	Digital Radiography Upgrade	Operating	1,200
	Lifecycle Replacement of Machine Tools & Equipment	Operating	1,400
	Equipment Skids for 300' Environmental Chambers	Operating	1,200
	High Explosives Development Machining Operations Center	GPP/MIE	200
	Linac Replacement	Operating/MIE	600
Sandia National Laboratory	DP Line Item OPCs (1 project)	OPC	1,000
	Sandia Silicon Fabrication Revitalization (SSiFR)	Operating	20,000
	Battery Test Facility (deferred from FY15, NEPA delays)	GPP	3,500
Savannah River Site	DP Line Item OPCs (1 project)	OPC	2,000
	Modify Unloading Station B	GPP	2,500
	Function Test Station Laser Replacement	GPP	1,200
Y-12 National Security Complex	DP Line Item OPCs (2 projects)	OPC	2,000
	Parts Cleaning for Direct Lithium Material Manufacturing	MIE	4,000
	Analytic & Manufacturing Equipment Upgrades	CE	2,200
Headquarters	CBI Contingency Reserves		5,527
Total			**104,327**

Readiness in Technical Base and Facilities
Construction

Description

The RTBF Construction subprogram plays a critical role in revitalizing the nuclear security enterprise including the nuclear weapons manufacturing and research and development infrastructure. Investments from this subprogram will improve the responsiveness and/or utility of the infrastructure and its technology base. The subprogram is focused on two primary objectives: (1) identification, planning, and prioritization of the projects supporting national security objectives, particularly the weapons programs, and (2) development and execution of these projects within approved cost and schedule baselines.

The funding request for FY 2016 reflects the continued design and preparatory construction for the Uranium Processing Facility (UPF) at Y-12. Following construction of the UPF building and installation of required support systems, installation of uranium processing equipment will be phased and prioritized to move critical capabilities out of Building 9212 as soon as practicable.

Requested FY 2016 funding will be used to continue construction of the Transuranic Waste Facility, the Radioactive Liquid Waste Treatment Facility Upgrade Project, and the TA-55 Reinvestment Project II, Phase C, LANL. The funding request also continues design of the TA-55 Reinvestment Project III and the Transuranic Liquid Waste Treatment Facility project at LANL.

FY 2016 construction funding also includes funding for two new subprojects reflected in the Chemistry and Metallurgy Research Replacement (CMRR) project data sheet (04-D-125) – RLUOB Equipment Installation Phase 2 (REI2) and PF-4 Equipment Installation (PEI).

50 US Code 2746 requires that if the estimated cost of completing a conceptual design for a construction project exceeds $3,000,000, the Secretary shall submit to Congress a request for funds for the conceptual design before submitting a request for funds for the construction project. NNSA anticipates that the estimated cost to complete the conceptual design of the following three projects will exceed the $3,000,000 threshold:

1. Weapons Engineering Facility at the Sandia National Laboratories, New Mexico, and;
2. Lithium Production Facility at the Y-12 National Security Complex and
3. Tritium Production Capability Upgrade Project at the Savannah River Site.

The rough-order of magnitude cost estimates to complete the conceptual design is between $7,000,000 and $8,000,000 for each of the above planned projects. NNSA plans to request design funds in FY 2017 for the Lithium Production Facility and Tritium Production Capability and for the Weapons Engineering Facility in FY 2019.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Construction $423,000,000	**Construction $660,190,000**	**Construction +$237,190,000**
• Continue design, non-nuclear subprojects and site preparation activities for UPF at Y-12. • Start design of the High Explosive (HE) Science and Engineering Facility at Pantex. • Continue construction of Transuranic (TRU) Waste Facility and TA-55 Reinvestment Project (TRP-II), Phase C subproject at LANL. • Start design of the TA-55 Reinvestment Project, Phase III at LANL. • Continue design of the TRU Liquid Waste (TLW) project, and continue construction on the Radioactive Liquid Waste Facility (RLWTF) Upgrade Project's Low Level Liquid Waste (LLW) subproject at LANL.	• Commence two new subprojects reflected in the Chemistry and Metallurgy Research Replacement (CMRR) project – RLUOB Equipment Installation Phase 2 (REI2) and PF-4 Equipment Installation (PEI). • Continue design, subprojects and site preparation activities for UPF at Y-12. • Continue construction of TRP-II, Phase C subproject and the RLWTF's LLW subproject at LANL. • Continue design of the TRP-III and the TLW projects at LANL. **FY 2017-FY 2020** • In FY 2017, start design and construction of the following: o Design of the Lithium Production Facility, Y-12. o Design of Tritium Production Capability Project, SRS. o Construction (long-lead procurement) of TA-55 Reinvestment Project, Phase III, LANL. o Construction of HE Science and Engineering Facility, Pantex. • In FY 2017, complete construction of: o TRU Waste Facility at LANL and start operation in FY 2018.	• Adds funding for CMRR's REI2 and PEI subprojects. • Continues previously started projects: RLWTF, TRP-III, TRP-II, and TLW at LANL and UPF at Y-12.

[a] The Infrastructure related line-item construction projects were previously performed under Construction in FY 2015. In FY 2016, these projects are now included under the Construction subprogram within the Infrastructure and Safety program in order to strengthen the program effectiveness by realigning similar programs and activities. The FY 2015 activities and funding are shown here in a comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	o TA-55 Reinvestment Project II, Phase C o RLWTF LLW Treatment Facility subproject. • In FY 2018, start design of the following: o High Explosive Component Fabrication and Qualification Facility, Pantex. o Energetic Materials Characterization Facility, LANL. • In FY 2019, start design of the Weapons Engineering Facility at SNL.	

Readiness in Technical Base and Facilities Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Construction Projects (formerly Major Construction Projects) - Execute construction projects within approved costs and schedules, as measured by the total percentage of projects with total estimated cost (TEC) greater than $20 million with a schedule performance index (ratio of budgeted cost of work performed to budgeted cost of work scheduled) and a cost performance index (ratio of budgeted cost of work performed to actual cost of work performed) between 0.9-1.15.							
Target	90% of projects	90% of projects	90% of projects	90% of projects	90% of projects	90% of projects	90% of projects
Result	90						
Endpoint Target	Annually achieve 90% of baselined construction projects with TEC greater than $20M with actual SPI and CPI of 0.9-1.15 as measured against approved baseline definitions.						
Operations of Facilities – Enable NNSA missions by providing operational facilities to support nuclear weapon dismantlement, life extension, surveillance, and research and development activities, as measured by percent of scheduled versus planned days mission-critical and mission-dependent facilities are available without missing key deliverables.							
Target	95% availability	85% availability	N/A	N/A	N/A	N/A	N/A
Result	95						
Endpoint Target	Mission critical and mission dependent facilities are available at least 85% of scheduled days annually.						

Note: The Operations of Facilities section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. The Operations of Facilities performance measure target has been reduced from 95% to 85% in FY 2015 because of budget reductions.

Readiness in Technical Base and Facilities
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	271,972	104,203	48,121	48,121	50,139	51,935	+1,796
Plant Projects (GPP) (<$10M)	224,485	62,213	32,645	30,728	49,004	37,945	-11,059
Total, Capital Operating Expenses	**496,457**	**166,416**	**80,766**	**78,849**	**99,143**	**89,880**	**-9,263**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	230,720	102,783	41,721	41,721	42,639	43,577	+938
Parts Cleaning for Direct Lithium Material Manufacturing	10,000	0	0	0	0	4,000	+4,000
CoLOSSIS II	7,952	620	5,100	5,100	1,400	358	-1,042
LINAC, Device Assembly Facility	3,200	800	1,300	1,300	1,100	0	-1,100
Jig Borer (5 Axis Milling Machine)	2,600	0	0	0	2,600	0	-2,600
Verson Hydro-Form Press	2,400	0	0	0	2,400	0	-2,400
Mass Properties Measurement Machine	3,200	0	0	0	0	3,200	+3,200
HE Development Machining Operations Center	7,100	0	0	0	0	200	200
LINAC Replacement	4,800	0	0	0	0	600	+600
Total, Capital Equipment (including MIE)	**271,972**	**104,203**	**48,121**	**48,121**	**50,139**	**51,935**	**+1,796**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	186,528	61,573	30,728	30,728	31,404	32,095	+691
Vacuum Chamber Upgrades, PX	9,557	640	1,917	0	7,000	0	-7,000
Modify Unloading B, SRS	8,000	0	0	0	5,500	2,500	-3,000
Environmental Testing Capability Investments for B61 and other LEPs (ARMAG), LANL	7,600	0	0	0	5,100	2,000	-3,100
Weather Enclosure at DARHT, LANL	7,500	0	0	0	0	1,000	+1,000
Replace Leaking Catalyst Vessel System, SRS	5,300	0	0	0	0	350	+350
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**224,485**	**62,213**	**32,645**	**30,728**	**49,004**	**37,945**	**-11,059**
Total, Capital Summary	**496,457**	**166,416**	**80,766**	**78,849**	**99,143**	**89,880**	**-9,263**

Outyears for Readiness in Technical Base and Facilities

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	58,510	46,216	47,117	49,840
Plant Projects (GPP) (<$10M)	38,051	40,223	34,261	35,015
Total, Capital Operating Expenses	**96,561**	**86,439**	**81,378**	**84,855**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	44,536	45,516	46,517	47,540
Parts Cleaning for Direct Lithium Material Manufacturing	6,000	0	0	0
CoLOSSIS II	474	0	0	0
HE Development Machining Operations Center	6,900	0	0	0
LINAC Replacement	600	700	600	2,300
Total Non-MIE Capital Equipment (>$500K)	**58,510**	**46,216**	**47,117**	**49,840**
Total, Capital Equipment (including MIE)	**58,510**	**46,216**	**47,117**	**49,840**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	32,801	33,523	34,261	35,015
Vacume Chamber Upgrades, PX	0	0	0	0
Modify Unloading B, SRS	0	0	0	0
Environmental Testing Capability Investments for B61 and other LEPs (ARMAG), LANL	500	0	0	0
Weather Enclosure At DARHT, LANL	3,250	3,250	0	0
Replace Leaking Catalyst Vessel System, SRS	1,500	3,450	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**38,051**	**40,223**	**34,261**	**35,015**
Total, Capital Summary	**96,561**	**86,439**	**81,378**	**84,855**

Construction Projects Summary
(Comparable)

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
19-D-xxx, Weapons Engineering Facility, SNL							
Total Estimated Cost (TEC)	TBD	0	0	0	0	0	0
Other Project Cost (OPC)	TBD	0	0	0	0	1,000	1,000
TPC, 19-D-xxx, Weapons Engineering Facility, SNL	**TBD**	**0**	**0**	**0**	**0**	**1,000**	**+1,000**
18-D-xxx, Energetic Materials Characterization, LANL							
TEC	TBD	0	0	0	0	0	0
OPC	TBD	0	0	0	0	2,000	+2,000
TPC, 18-D-xxx, Energetic Materials Characterization, LANL	**TBD**	**0**	**0**	**0**	**0**	**2,000**	**+2,000**
18-D-xxx, HE Component Fab & Qual Facility, PX							
TEC	TBD	0	0	0	0	0	0
OPC	TBD	0	0	0	0	1,000	+1,000
TPC, 18-D-xxx, HE Component Fab & Qual Facility, PX	**TBD**	**0**	**0**	**0**	**0**	**1,000**	**+1,000**
17-D-xxx, Tritium Production Capability, SRS							
TEC	TBD	0	0	0	0	0	0
OPC	TBD	0	0	0	2,000	1,000	-1,000
TPC, 17-D-xxx, Tritium Production Capability, SRS	**TBD**	**0**	**0**	**0**	**2,000**	**1,000**	**-1,000**
17-D-xxx, Lithium Production Facility, Y-12							
TEC	TBD	0	0	0	0	0	0
OPC	TBD	0	0	0	2,000	1,000	-1,000
TPC, 17-D-xxx, Lithium Production Facility, Y-12	**TBD**	**0**	**0**	**0**	**2,000**	**1,000**	**-1,000**

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
15-D-302, TA-55 Reinvestment Project Phase III, LANL							
TEC	140,062	0	0	0	16,062	18,195	+2,133
OPC	29,500	500	4,000	4,000	3,000	3,000	0
TPC, 15-D-302, TA-55 Reinvestment Project Phase III, LANL	**169,562**	**500**	**4,000**	**4,000**	**19,062**	**21,195**	**+2,133**
15-D-301, HE Science & Engineering Facility, PX							
TEC	97,300	0	0	0	11,800	0	-11,800
OPC	57,179	1,790	750	750	100	100	0
TPC, 15-D-301, HE Science & Engineering Facility, PX	**154,479**	**1,790**	**750**	**750**	**11,900**	**100**	**-11,800**
12-D-301, TRU Waste Facilities, LANL							
TEC	83,990	50,330	26,722	26,722	6,938	0	-6,938
OPC	22,874	11,677	0	3,593	3,580	3,322	-258
TPC, 12-D-301, TRU Waste Facilities, LANL	**106,864**	**62,007**	**26,722**	**30,315**	**10,518**	**3,322**	**-7,196**
11-D-801, TA-55 Reinvestment Project, Phase 2, LANL							
TEC	97,464	52,882	30,679	30,679	10,000	3,903	-6,097
OPC	14,462	8,944	270	270	1,208	3,015	+1,807
TPC, 11-D-801, TA-55 Reinvestment Project, Phase 2, LANL	**111,926**	**61,826**	**30,949**	**30,949**	**11,208**	**6,918**	**-4,290**
10-D-501, Nuclear Facility Risk Reduction, Y-12							
TEC	65,796	47,887	0	0	0	0	0
OPC	10,000	5,423	0	661	1,224	978	-246
TPC, 10-D-501, Nuclear Facility Risk Reduction, Y-12	**75,796**	**53,310**	**0**	**661**	**1,224**	**978**	**-246**

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
08-D-802, High Explosive Pressing Facility, PX							
TEC	140,397	123,276	0	0	0	0	0
OPC	4,840	2,789	0	300	400	0	-400
TPC, 08-D-802, High Explosive Pressing Facility, PX	**145,237**	**126,065**	**0**	**300**	**400**	**0**	**-400**
07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade, LANL							
TEC	101,639	44,992	45,114	45,114	0	11,533	+11,533
OPC	17,488	12,087	533	533	868	3,741	+2,873
TPC, 07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade, LANL	**119,127**	**57,079**	**45,647**	**45,647**	**868**	**15,274**	**+14,406**
07-D-220-04, Transuranic Liquid Waste Facility, LANL							
TEC	92,602	0	10,605	10,605	7,500	40,949	+33,449
OPC	10,428	0	3	3	50	2,061	+2,011
TPC, 07-D-220-04, Transuranic Liquid Waste Facility, LANL	**103,030**	**0**	**10,608**	**10,608**	**7,550**	**43,010**	**+35,460**
06-D-140, Project Engineering and Design (PED), VL							
TEC	39,992	0	0	2,500	0	0	0
OPC	0	0	0	0	0	0	0
TPC, 06-D-140, Project Engineering and Design (PED), VL	**39,992**	**0**	**0**	**2,500**	**0**	**0**	**0**
06-D-141, PED/Construction, Uranium Processing Facility, Y-12							
TEC	TBD	820,968	NA	NA	NA	NA	NA
OPC	TBD	95,128	NA	NA	NA	NA	NA
TPC, 06-D-141, PED/Construction, Uranium Processing Facility, Y-12	**TBD**	**916,096**	**309,000**	**304,000**	**335,000**	**430,000**	**+95,000**

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL							
TEC	2,358,926	797,082	NA	NA	NA	NA	NA
OPC	518,941	104,604	NA	NA	NA	NA	NA
TPC, 04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL	**2,877,867**	**901,686**	**0**	**0**	**35,700**	**155,610**	**+119,910**
Total All Construction Projects							
TEC	3,218,168	1,937,417	113,120	115,620	52,300	74,580	+22,280
OPC	685,712	242,942	5,556	10,110	14,430	22,217	+7,787
Total Project Cost (TPC) All Construction Projects	**3,903,880**	**2,180,359**	**118,676**	**125,730**	**66,730**	**96,797**	**+30,067**

Outyears to Completion for Readiness in Technical Base and Facilities

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
19-D-XXX, Weapons Engineering Facility, SNL					
TEC	0	0	10,023	20,902	TBD
OPC	1,000	2,000	4,000	2,000	TBD
TPC, 19-D-XXX, Weapons Engineering Facility, SNL	**1,000**	**2,000**	**14,023**	**22,902**	**TBD**
18-D-XXX, Energetic Materials Characterization, LANL					
TEC	0	7,000	11,500	18,120	TBD
OPC	200	200	1,000	2000	TBD
TPC, 18-D-XXX, Energentic Materials Characterization, LANL	**200**	**7,200**	**12,500**	**20,120**	**TBD**
18-D-XXX, HE Component Fabrication & Qualification Facility, PX					
TEC	0	21,300	11,346	9,000	TBD
OPC	1,000	1,000	1,000	2,000	TBD
TPC, 18-D-XXX, HE Component Fabrication & Qualification Facility, PX	**1,000**	**22,300**	**12,346**	**11,000**	**TBD**
17-D-xxx, Tritium Production Capability, SRS					
TEC	6,800	25,505	49,500	13,000	TBD
OPC	1,000	500	500	2,000	TBD
TPC, 17-D-xxx, Tritium Production Capability, SRS	**7,800**	**26,005**	**50,000**	**15,000**	**TBD**
17-D-XXX, Lithium Production Facility, Y-12					
TEC	28,500	34,500	53,000	4,000	TBD
OPC	500	500	2,000	2,000	TBD
TPC, 17-D-XXX, Lithium Production Facility, Y-12	**29,000**	**35,000**	**55,000**	**6,000**	**TBD**

	(Dollars in Thousands)				
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
15-D-302, TA-55 Reinvestment Project Phase III, LANL					
TEC	21,455	23,300	17,500	12,996	30,554
OPC	3,000	3,000	6,000	4,000	3,000
TPC, 15-D-302, TA-55 Reinvestment Project Phase III, LANL	**24,455**	**26,300**	**23,500**	**16,996**	**33,554**
15-D-301, HE Science and Engineering Facility, PX					
TEC	19,516	27,435	19,953	17,752	0
OPC	100	6,000	13,654	14,451	20,234
TPC, 15-D-301, HE Science and Engineering Facility, PX	**19,616**	**33,435**	**33,607**	**32,203**	**20,234**
12-D-301, TRU Waste Facilities, LANL					
TEC	0	0	0	0	0
OPC	720	0	0	0	0
TPC, 12-D-301, TRU Waste Facilities, LANL	**720**	**0**	**0**	**0**	**0**
11-D-801, TA-55 Reinvestment Project, Phase 2, LANL					
TEC	0	0	0	0	0
OPC	1,025	0	0	0	0
TPC, 11-D-801, TA-55 Reinvestment Project, Phase 2, LANL	**1,025**	**0**	**0**	**0**	**0**
07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade, LANL					
TEC	0	0	0	0	0
OPC	259	0	0	0	0
TPC, 07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade, LANL	**259**	**0**	**0**	**0**	**0**

	(Dollars in Thousands)				
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
07-D-220-04, Transuranic Liquid Waste Facility, LANL					
TEC	17,053	8,995	0	0	7,500
OPC	1,500	1,500	2,000	3,314	0
TPC, 07-D-220-04, Transuranic Liquid Waste Facility, LANL	**18,553**	**10,495**	**2,000**	**3,314**	**7,500**
06-D-141, PED/Construction, Uranium Processing Facility, Y-12					
TEC	NA	NA	NA	NA	NA
OPC	NA	NA	NA	NA	NA
TPC, 06-D-141, PED/Construction, Uranium Processing Facility, Y-12	**500,000**	**515,000**	**520,000**	**525,000**	**TBD**
04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL					
TEC	NA	NA	NA	NA	NA
OPC	NA	NA	NA	NA	NA
TPC, 04-D-125, Chemistry and Metallurgy Research Replacement Project, LANL	**159,615**	**180,900**	**216,095**	**239,600**	**942,000**
Total All Construction Projects					
TEC	93,324	148,035	172,822	95,770	38,054
OPC	10,304	14,700	30,154	31,765	23,234
Total Project Cost (TPC) All Construction Projects	**763,243**	**858,635**	**939,071**	**892,135**	**1,003,288**

15-D-302, TA-55 Reinvestment Project (TRP) Phase III
Los Alamos National Laboratory (LANL), Los Alamos, New Mexico
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update from the Fiscal Year (FY) 2015 CPDS and does not include a new start for the budget year.

Summary

The most recent DOE O 413.3B approved Critical Decision (CD) for the overall project is CD-0 that was approved on March 23, 2005, with a pre-conceptual design Total Project Cost Range of $125,000 to $195,000. Since the CD-0 approval, the project was split into three projects, TRP I, TRP II and TRP III. A CD-3A may be needed to procure long-lead equipment items. This will be determined upon CD-1 approval. All milestone dates and critical decisions have been delayed to comply with the Government Accountability Office 12 step cost and 24 step analysis of alternatives guidance and include additional time for reviews required by new project management improvement guidance. In addition, the top cost range has been increased due to changes in milestone dates.

A Federal Project Director has not been assigned to this project, but one will be assigned upon CD-1 approval.

The conceptual design evaluated three potential upgrades that were approved as part of the mission need and not previously executed as part of TRP I and TRP II. The upgrades support the implementation of the Defense Nuclear Facilities Safety Board Recommendations 2009-2. FY 2016 funding will be used for full funding of the design, for contracted support services to the Federal Project Director for independent reviews for CD-1 and CD-2, developing the safety basis documents, and initiating long-lead procurements if needed.

2. Critical Milestone History

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2015	03/23/2005		1Q FY 2015	4Q FY 2017	2Q FY 2018	2Q FY 2018	NA	4Q FY 2022
FY 2016	03/23/2005	12/23/2014	4Q FY 2016	4Q FY 2018	2Q FY 2018	4Q FY 2018	NA	3Q FY 2026

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

	(Fiscal Quarter or Date)
	CD-3A
FY 2017:	1Q FY 2018

CD-3A: Approve long-lead procurement activities.

3. Project Cost History

	TEC, Design	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	30,062	110,000	140,062	29,500	NA	29,500	169,562
FY 2016	30,060	150,002	180,062	46,500	NA	46,500	226,562

4. Project Scope and Justification

Scope

The conceptual design evaluated the following three upgrades that were approved as part of the mission need, were not previously executed as part of TRP I and TRP II; but which support the implementation of the Defense Nuclear Facilities Safety Board Recommendations 2008-2:

1. Replacing fire suppression systems, upgrading fire alarm panels, wiring and devices,
2. Upgrading PF-4 ventilation system; and
3. Removing TA-55 Office Buildings from the Fire Water Loop.

Justification

The Plutonium Faciltiy-4 (PF-4) within Technical Area (TA) 55 is a Hazard Category 2 nuclear facility. The mission need for the TRP III is driven by the fact that PF-4 proposed upgrades are planned in the only NNSA facility authorized to produce plutonium pits for the enduring stockpile. PF-4 has been in operation for over 35 years and, before the TRP I and TRP II upgrades, the infrastructure and systems were aging and approaching the end of their service life, required excessive maintenance, and experienced increased operating costs and reduced system reliability. And the facility is not in compliance with increases in safety and regulatory requirements that are required for the fire protection systems, confinement ventilation, and fire water distribution. TRP III is the final phase of the three-phase project that will upgrade PF-4 within the TA-55 boundary at LANL.

There are three potential subprojects for TRP III that were evaluated in conceptual design, ventilation system upgrades, fire water loop upgrades, and replacement of fire alarm panels and devices. The subproject(s) and the alternative(s) will be approved at CD-1. For the ventilation system, the alternatives range from replacement in kind to upgrading to a safety class Active Confinement System; for the fire water loop, the alternatives include installation of ML-4 fire water system for the office buildings to installation/modification of safety class fire water loop for the plutonium facility. There is only one alternative being evaluated for replacement of the fire alarm panel and devices since the current system is not compliant with the National Fire Protection codes.

Funds appropriated under this data sheet may be used for contracted support services to the Federal Project Director to conduct independent assessments of the planning and execution of this project required by DOE Order 413.3B and to conduct technical reviews of design and construction documents.

The project is being conducted in accordance with the project management requirements in DOE O413.3B, Program and Project Management for the Acquisition of Capital Assets.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	N/A	N/A	6,000
FY 2016	N/A	N/A	18,060
FY 2017	N/A	N/A	4,000
FY 2018	N/A	N/A	2,000
Total, Design	N/A	N/A	30,060
Construction			
FY 2017	N/A	N/A	0
FY 2018	N/A	N/A	10,000
FY 2019	N/A	N/A	15,000
FY 2020	N/A	N/A	35,000
FY 2021	N/A	N/A	35,000
FY 2022	N/A	N/A	15,002
FY 2023	N/A	N/A	30,000
FY 2024	N/A	N/A	10,000
Total, Construction	N/A	N/A	150,002
TEC			
FY 2015	16,062	16,062	6,000
FY 2016	18,195	18,195	18,060
FY 2017	21,455	21,455	4,000
FY 2018	23,300	23,300	12,000
FY 2019	17,500	17,500	15,000
FY 2020	12,996	12,996	35,000
FY 2021	30,554	30,554	35,000
FY 2022	20,000	20,000	15,002
FY 2023	15,000	15,000	30,000
FY 2024	5,000	5,000	10,000
Total, TEC	180,062	180,062	180,062
Other Project Cost (OPC)			
OPC except D&D			
FY 2013	500	500	500
FY 2014	4,000	4,000	4,000

(dollars in thousands)

	Appropriations	Obligations	Costs
FY 2015	3,000	3,000	3,000
FY 2016	3,000	3,000	3,000
FY 2017	3,000	3,000	3,000
FY 2018	3,000	3,000	3,000
FY 2019	3,000	3,000	3,000
FY 2020	3,000	3,000	3,000
FY 2021	3,000	3,000	3,000
FY 2022	3,000	3,000	3,000
FY 2023	3,000	3,000	3,000
FY 2024	5,000	5,000	5,000
FY 2025	6,000	6,000	6,000
FY 2026	4,000	4,000	4,000
Total, OPC except D&D	46,500	46,500	46,500
Total Project Cost (TPC)			
FY 2013	500	500	500
FY 2014	4,000	4,000	4,000
FY 2015	19,062	19,062	9,000
FY 2016	21,195	21,195	21,060
FY 2017	24,455	24,455	7,000
FY 2018	26,300	26,300	15,000
FY 2019	20,500	20,500	18,000
FY 2020	15,996	15,996	38,000
FY 2021	33,554	33,554	38,000
FY 2022	23,000	23,000	18,002
FY 2023	18,000	18,000	33,000
FY 2024	10,000	10,000	15,000
FY 2025	6,000	6,000	6,000
FY 2026	4,000	4,000	4,000
Total TPC	226,562	226,562	226,562

6. Details of Project Cost Estimate

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	23,560	23,562	NA
Federal Support	1,500	1,500	NA
Contingency	5,000	5,000	NA
Total, Design	30,060	30,062	NA
Construction			
Long Lead Procurements	8,000	0	NA
Equipment	6,002	6,000	NA
Construction	95,000	83,000	NA
Safety Basis	10,000	0	NA
Federal Support	2,000	2,000	NA
Contingency	29,000	19,000	NA
Total, Construction	150,002	110,000	NA
Total, TEC	180,062	140,063	NA
Contingency, TEC	34,000	24,000	NA
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	2,000	2,000	NA
Conceptual Design	8,000	6,000	NA
Start-Up	15,000	10,000	NA
Project Support	2,000	2,000	NA
Contingency	19,500	9,500	NA
Total, OPC except D&D	46,500	29,500	NA
Total, OPC	46,500	29,500	NA
Contingency, OPC	19,500	9,500	NA
Total, TPC	226,562	169,563	NA
Total, Contingency	53,500	33,500	NA

7. Schedule of Appropriation Requests

		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Outyears	Total
FY 2015	TEC	0	16,062	38,000	33,000	31,000	10,000	10,000	2,000	140,062
	OPC	500	3,000	3,000	3,000	3,000	6,000	4,000	3,000	29,500
	TPC	500	19,062	41,000	36,000	34,000	16,000	14,000	5,000	169,562
FY 2016	TEC	0	16,062	18,195	21,455	23,300	17,500	12,996	70,554	180,062
	OPC	4,500	3,000	3,000	3,000	3,000	3,000	3,000	24,000	46,500
	TPC	4,500	19,062	21,195	24,455	26,300	20,500	15,996	94,554	226,562

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	NA
Expected Useful Life (number of years)	NA
Expected Future Start of D&D of this capital asset (fiscal quarter)	NA

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	NA	NA	NA	NA
Utilities	NA	NA	NA	NA
Maintenance & Repair	NA	NA	NA	NA
Total	NA	NA	NA	NA

9. D&D Information

There is no new area being constructed in this construction project.

10. Acquisition Approach

Design and Construction Management will be implemented by Los Alamos National Security, LLC through the LANL Management and Operating Contract. The TRP III Acquisition Strategy is based on tailored procurement strategies in order to mitigate risks that are inherent in construction activities going on simultaneously with facility operations. The TRP III will be implemented via LANL-issued final design/construction contracts based on detailed performance requirements/specifications developed during the preliminary design phase.

15-D-301 High Explosive Science and Engineering (HE S&E) Facility
Pantex Plant, Amarillo, Texas
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes
This Construction Project Data Sheet (CPDS) is an update of the Fiscal Year (FY) 2015 CPDS and does not include a new start for the budget year.

The project conceptual design and all other documents, including detailed cost and schedule estimate ranges, required for Critical Decision (CD) 1, Approve Alternative Selection and Cost Range, have been completed. Based on the detailed cost estimate, verified by an Independent Cost Review, the top range of the total estimated cost (TEC) has increased to $97,300 from $72,200 reported in the President's FY 2015 budget request.

Since the FY 2015 budget submittal, construction markets have become less competitive, resulting in higher bids that have been received on other projects. In order to protect against further potential higher design and construction bids, the project design and construction costs and contingency have been increased, resulting in a total increase in the TEC of 35 percent. Title 50, United Stated Code 2744, Section (a) requires:

"..construction on a construction project which is in support of national security programs of the Department of Energy and was authorized by a DOE national security authorization may not be started, and additional obligations in connection with the project above the total estimated cost may not be incurred, whenever the current estimated cost of the construction project exceeds by more than 25 percent the higher of-

(1) the amount authorized for the project; or
(2) the amount of the total estimated cost for the project as shown in the most recent budget justification data submitted to Congress."

Based on a conservative interpretation of this statute, this CPDS is submitted to notify Congress on the TEC increase. Additional funds are not requested in FY 2016.

The CD-2 is combined with the CD-3 to follow completion of the final design. In addition, the Other Project Costs have increased to include the relocation of utilities in Zone 11 to maintain utilities for the remaining facilities in Zone 11 after the HE S&E existing facilities have been demolished, which was not part of the CD-0 estimate. As a result, the Total Project Cost top range is estimated to be $154,479.

Summary
The most recent DOE O 413.3B approved Critical Decision (CD) is CD-1, Approve Alternative Selection and Cost Range that was approved on December 10, 2014, with a preliminary cost range of $100,000 to $155,000 and CD-4 date of 4th Quarter FY 2023.

A Federal Project Director has been assigned to this project and has approved the CPDS.

The Pantex Plant mission includes fabricating High Explosives (HE) components for stockpile systems through HE manufacturing, surveillance, and testing. These fabrication activities are currently located in 15 different facilities that are an average of 58 years old and spread over a wide area with high deferred maintenance costs and are not built to current codes. The HE S&E facility project is planned to consolidate activities from these 15 facilities to a modern facility that is built to current building code requirements, reduce footprint, and eliminate deferred maintenance by demolishing the old facilities upon completion of the new facility.

2. Critical Milestone History

(fiscal quarter or date[a])

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2015	11/22/2011		4Q FY 2014	4Q FY 2015	3QFY 2016	4QFY 2016	3QFY 2020	3QFY 2020
FY 2016	11/22/2011	1/9/2015	1/09/2015	1QFY 2018	4QFY 2017	1QFY 2018	3QFY 2023	4QFY 2023

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History

	TEC, Design	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	11,800	60,500	72,300	6,100	18,600	24,700	97,000
FY 2016	14,249	83,051	97,300	21,055	36,124	57,179	154,479

4. Project Scope and Justification

Scope

Build three structures approximately 73,000 square feet (±15%) with associated weather-proofed ramps to replace the aging facilities in Zone 11 that meets current codes and standards and program needs:

- HE Lab: Equipment and facility will be designed to sustain an HE loading of 12 lb (±15%) HE equivalent.
- HE Staging: Equipment and facility will be designed to sustain 50 lb (±15%) HE equivalent for temporary storage.
- Technology Development and Deployment Laboratory: Provide necessary laboratory space for a minimum of 73 technology development and deployment personnel to support the weapons complex mission.

Justification

The current HE ST&E personnel, as well as laboratory operations, are located in 15 separate facilities which are an average of 58 years old. They are not constructed for today's operations, HE limits, are spread out and do not provide for efficient work processes. Distance between facilities increases travel time for personnel and materials back and forth which add additional cost to operations. In addition, safety, security, and environmental issues associated with these aging facilities are mounting, as are the costs of addressing them.

Current HE capacity limits that prohibit quantities greater than a small amount create inefficient operations in several of the laboratories. HE limits mandate additional moves of HE to various facilities as well as to maintain safe separation limits. The HE capacity limitations are primarily due to the original design and structure of the old facilities. For example a current single-room facility layout requires the HE sampled to be containerized and moved out of the facility before opening, then removing the sample to perform the analysis. The numerous HE handling activities required to load, unload and move the HE increase potential safety hazards.
The project is being conducted in accordance with the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets.

[a] The schedules are only estimates and are consistent with the high end of the schedule ranges.

5. Financial Schedule

(dollars in thousands[a])

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	N/A	N/A	2,000
FY 2016	N/A	N/A	7,000
FY 2017	N/A	N/A	5,249
Total, Design	N/A	N/A	14,249
Construction			
FY 2018	N/A	N/A	27,734
FY 2019	N/A	N/A	35,000
FY 2020	N/A	N/A	19,189
FY 2021	N/A	N/A	284
Total, Construction	N/A	N/A	82,207
TEC			
FY 2015	11,800	11,800	2,000
FY 2016	0	0	7,000
FY 2017	19,516	19,516	5,249
FY 2018	27,435	27,435	27,734
FY 2019	19,953	19,953	35,000
FY 2020	17,752	17,752	19,189
FY 2021	0	0	284
Total, TEC	96,456	96,456	96,456
Other Project Cost (OPC)			
OPC except D&D			
FY 2013	N/A	N/A	1,790
FY 2014	N/A	N/A	750
FY 2015	N/A	N/A	100
FY 2016	N/A	N/A	100
FY 2017	N/A	N/A	100
FY 2018	N/A	N/A	3,000
FY 2019	N/A	N/A	3,654

[a] The numbers are only estimates and consistent with the high end of the cost ranges.

(dollars in thousands)

	Appropriations	Obligations	Costs
FY 2020	N/A	N/A	4,451
FY 2021	N/A	N/A	5,110
FY 2022	N/A	N/A	2,000
Total, OPC except D&D	N/A	N/A	21,055
D&D			
FY 2018	N/A	N/A	3,000
FY 2019	N/A	N/A	10,000
FY 2020	N/A	N/A	10,000
FY 2021	N/A	N/A	5,463
FY 2022	N/A	N/A	5,643
FY 2023	N/A	N/A	2,018
Total, D&D	N/A	N/A	36,124
Total OPC			
FY 2013	1,790	1,790	1,790
FY 2014	750	750	750
FY 2015	100	100	100
FY 2016	100	100	100
FY 2017	100	100	100
FY 2018	6,000	6,000	6,000
FY 2019	13,654	13,654	13,654
FY 2020	14,451	14,451	14,451
FY 2021	10,573	10,573	10,573
FY 2022	7,643	7,643	7,643
FY 2023	2,018	2,018	2,018
Total, OPC	57,179	57,179	57,179
Total Project Cost (TPC)			
FY 2013	1,790	1,790	1,790
FY 2014	750	750	750
FY 2015	11,900	11,900	2,100
FY 2016	100	100	7,100
FY 2017	19,616	19,616	5,349
FY 2018	33,435	33,435	33,734
FY 2019	33,607	33,607	48,654
FY 2020	32,203	32,203	33,640
FY 2021	10,573	10,573	10,857
FY 2022	7,643	7,643	7,643
FY 2023	2,018	2,018	2,018
Total, TPC	153,635	153,635	153,635

6. Details of Project Cost Estimate

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	12,444	9,000	N/A
Federal Design Reviews-Support	500	500	
Contingency	1,305	2300	N/A
Total, Design	14,249	11,800	N/A
Construction			
Site Work	5,000	5,000	N/A
Equipment	5,000	5,000	N/A
Construction	51,300	38,000	N/A
Federal Project Review/Support	2,000	2,000	N/A
Contingency	20,478	10,500	N/A
Total, Construction	83,051	60,500	N/A
Total, TEC	97,300	72,300	N/A
Contingency, TEC	21,783	12,800	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	390	390	N/A
Conceptual Design	1,800	1,210	N/A
startup	3,000	3,000	N/A
Equipment Move	9,473	N/A	
Other OPC Costs (Utility Relocation)	0	400	N/A
Contingency	6,392	1,100	N/A
Total, OPC except D&D	21,055	6,100	N/A
D&D			
D&D	6,464	15,044	N/A
Utility Relocation	23,000	0	N/A
Contingency	6,660	3,556	N/A
Total, D&D	36,124	18,600	N/A
Total, OPC	57,179	24,700	N/A
Contingency, OPC	13,052	4,656	N/A
Total, TPC	154,479	97,000	N/A
Total, Contingency	34,835	17,456	N/A

7. Schedule of Appropriation Requests

Request		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Out Years	Total
FY 2015	TEC	0	11,800	0	20,000	33,500	7,000	0	0	72,300
	OPC	2,540	100	100	100	6,000	13,654	2,206	0	24,700
	TPC	2,540	11,900	100	20,100	39,500	20,654	2,206		97,000
FY 2016	TEC	0	11,800	0	19,516	27,435	19,953	17,752	0	96,456
	OPC	2,540	100	100	100	6,000	13,654	14,451	20,234	57,179
	TPC	2,540	11,900	100	19,616	33,435	33,607	32,203	20,234	153,635

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	4QFY 2024
Expected Useful Life (number of years)	50
Expected Future Start of D&D of this capital asset (fiscal quarter)	4QFY 2073

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	13,000	N/A	650,000	N/A
Maintenance & Utilities	2,140	N/A	107,000	N/A
Total	15,140	N/A	757,000	N/A

9. D&D Information

	Square Feet
New area being constructed by this project at Pantex Plant ……..	73,000
Area of D&D in this project at the Pantex Plant ……..……..	73,000
Area at the Pantex Plant to be transferred, sold, and/or D&D outside the project including area previously "banked" ……	0
Area of D&D in this project at other sites ……..	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked" ……	0
Total area eliminated ……..……..	73,000

Pantex Plant Zone 11, Bldgs 11-2, 11-5, 11-14, 11-16, 11-18, 11-19, 11-22, 11-27, 11-28, 11-29, 11-38, 11-45, 11-51, 12-2A, & 09-059. Substitute building(s) may be identified for demolition prior to performance baseline approval (CD-2).

10. Acquisition Approach

Both the design and construction will be acquired through firm-fixed price contracts.

11-D-801, TA-55 Reinvestment Project – Phase II (TRP II)
Los Alamos National Laboratory (LANL), Los Alamos, New Mexico
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update of the Fiscal Year (FY) 2015 CPDS and does not include a new start for the budget year.

The costs for Phase A and B are updated to reflect the final cost reports for the two phases after all cost accounts were closed-out. Phase C has completed design, approved a performance baseline, and started construction.

Summary

The most recent DOE Order (O) 413.3B approved Critical Decision (CD) was the CD-2, Approve Performance Baseline and CD-3, Approve Start of Construction, for the TRP II, Phase C on August 4, 2014.

11-D-801-01 Phase A: Glovebox #1 and Air Dryers

The most recent DOE O 413.3B-approved CD is CD-4, Approve Start of Operations for Phase A, which was approved on May 29, 2013, with a projected Total Project Cost (TPC) of $11,694, which was below baseline cost. This was further reduced to $11,519 after final costs accounts were closed out. The TPC amount reported in the FY 2015 budget request was incorrect. Phase A scope included seismic upgrade of one glovebox stand, installation of three Air Dryers and demolition of the fourth. Consistent with the budget guidance, under-runs will be used to complete Phase C activities.

11-D-801-02 Phase B: Glovebox #2 and Confinement Doors

The most recent DOE O 413.3B-approved CD is CD-4 Approve Start of Operations, which was approved on September 12, 2013, with a projected Total Project Cost (TPC) of $7,900, which was below baseline cost. This was further reduced to $7,711 after final costs accounts were closed out. The TPC amount reported in the FY 2015 budget request was incorrect. The scope included seismic upgrade of one glovebox stand and the installation of six confinement doors. Consistent with the budget guidance, under-runs will be used to complete Phase C activities.

11-D-801-03 Phase C: Glovebox #3, Exhaust Stack, UPS, Criticality Alarm System (CAS), Vault Water Tanks, and PF-7 Demolition

The most recent DOE O 413.3B-approved CD is CD-2, Approve Performance Baseline and CD-3, Approve Start of Construction, which was approved on August 4, 2014 with TPC of $92,696 and CD-4 date of January 8, 2018. The Phase C project funding profile is consistent with the approved baseline. The Phase C cost estimate was validated by an Independent Cost Estimate. Phase C scope includes: A seismic upgrade to the GB #3 stands; Upgrade the sampling system for existing PF-4 exhaust stacks; PF-7 demolition to prepare for the uninterruptable power supply installation; Replace existing Uninterruptible Power Supply; Upgrade Vault water tanks cooling system, and replace existing Criticality Alarm System in PF-4. Consistent with the approved project baseline, the TEC funds requested in FY 2016 are needed to increase the available Phase C contingency to mitigate potential risks. The project received bids for the UPS Building and the CAS that are significantly higher than the estimated and independently validated costs. The impacts of higher bids are being evaluated by the project team and may require additional funds in future-years to mitigate remaining risks. Demolition of Building PF-7 has been completed.

A Federal Project Director has been assigned to this project and has approved this CPDS.

2. Critical Milestone History

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete[a]	CD-3	D&D Complete	CD-4
FY 2011	03/23/2005		7/15/2008	TBD	3QFY2012	TBD	N/A	TBD
FY 2012	03/23/2005		7/15/2008	TBD	3QFY2012	TBD	N/A	TBD
FY 2013	03/23/2005		7/15/2008	4Q FY 2012	3QFY2012	1Q FY 2014	4Q FY 2017	4Q FY 2017
FY 2014	03/23/2005		7/15/2008	2Q FY 2014	2QFY2014	2Q FY 2014	4Q FY 2017	4Q FY 2017
FY 2015	03/23/2005		7/15/2008	3Q FY 2014	2QFY2014	3Q FY 2014	4Q FY 2017	4Q FY 2017
FY 2016 PB	03/23/2005	7/15/2008	7/15/2008	08/04/2014	2QFY2014	08/04/2014	12/23/2014	2Q FY 2018

11-D-801-01 Phase A: Glovebox #1 and Air Dryers

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	03/23/2005		07/15/2008	11/24/2009	3QFY2012	1QFY2010	N/A	3QFY2013
FY 2012	03/23/2005		07/15/2008	11/24/2009	2QFY2011	1QFY2011	N/A	3QFY2013
FY 2013	03/23/2005		07/15/2008	11/24/2009	1QFY 2011	11/28/2011	N/A	4QFY2013
FY 2014	03/23/2005		07/15/2008	11/24/2009	11/22/2011	11/22/2011	N/A	4QFY2013
FY 2015	03/23/2005		07/15/2008	11/24/2009	11/22/2011	11/22/2011	N/A	5/29/2013
FY 2016	03/23/2005	7/15/2008	07/15/2008	11/24/2009	11/22/2011	11/22/2011	N/A	5/29/2013

11-D-801-02 Phase B: Glovebox 2 and Confinement Doors

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	03/23/2005		07/15/2008	3QFY2010	3QFY2012	TBD	N/A	TBD
FY 2012	03/23/2005		07/15/2008	06/03/2010	4QFY2011	4QFY2011	N/A	2QFY2014
FY 2013	03/23/2005		07/15/2008	06/03/2010	1QFY 2011	2QFY2012	N/A	1QFY2014
FY 2014	03/23/2005		07/15/2008	06/03/2010	02/13/2012	02/13/2012	N/A	1QFY2014
FY 2015	03/23/2005		07/15/2008	06/03/2010	02/13/2012	02/13/2012	N/A	9/12/2013
FY 2016	03/23/2005	7/15/2008	07/15/2008	06/03/2010	02/13/2012	02/13/2012	N/A	9/12/2013

11-D-801-03 Phase C: Glovebox 3, Exhaust Stack, UPS, Criticality Alarm System, Vault Water Tanks, and PF-7Demolition

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	03/23/2005		07/15/2008	3QFY2011	3QFY2012	TBD	N/A	TBD
FY 2012	03/23/2005		07/15/2008	3QFY2011	3QFY2012	TBD	N/A	TBD
FY 2013	03/23/2005		07/15/2008	4QFY2012	3QFY2012	1QFY2014	4Q FY 2017	4QFY2017
FY 2014	03/23/2005		7/15/2008	2Q FY 2014	2QFY2014	2Q FY 2014	4Q FY 2017	4Q FY 2017
FY 2015	03/23/2005		7/15/2008	3Q FY 2014	2QFY2014	3Q FY 2014	4Q FY 2017	4Q FY 2017
FY 2016 PB	03/23/2005	7/15/2008	7/15/2008	08/04/2014	2/28/2014	08/04/2014	12/23/2014	2Q FY 2018

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges

[a] PED funds are used only for the preliminary design. Final design is performed with construction funds.

CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete/d
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History

(dollars in thousands)

	TEC, Design 06-D-140	TEC, Design 11-D-801	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	13,684	TBD	TBD	TBD	TBD	N/A	TBD	TBD
FY 2012	14,684	12,700	56,715	84,099	15,477	N/A	15,477	99,576
FY 2013	14,745	6,664	62,864	84,273	15,627	N/A	15,627	99,900
FY 2014	14,745	9,142	60,386	84,273	15,199	428	15,627	99,900
FY 2015	14,745	9,142	69,674	93,561	14,764	866	15,630	109,191
FY 2016	14,745	12,552	70,167	97,464	14,125	337	14,462	111,926

11-D-801-01 Phase A: Glovebox #1 and Air Dryers

(dollars in thousands)

	TEC, Design 06-D-140	TEC, Design 11-D-801	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	3,700	TBD	15,330	19,030	440	N/A	440	19,470
FY 2012	4,289	1,848	12,448	18,585	443	N/A	443	19,028
FY 2013	2,890	1,176	9,093	13,159	495	N/A	495	13,654
FY 2014	2,890	568	9,701	13,159	495	N/A	495	13,654
FY 2015	2,890	568	9,351	12,809	495	N/A	495	13,304
FY 2016	2,801	450	7,737	10,988	531	N/A	531	11,519

11-D-801-02 Phase B: Glovebox #2 and Confinement Doors

(dollars in thousands)

	TEC, Design 06-D-140	TEC, Design 11-D-801	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2012	5,069	854	11,041	16,964	621	N/A	621	17,585
FY 2013	3,348	67	7,119	10,534	704	N/A	704	11,238
FY 2014	3,348	167	7,019	10,534	704	N/A	704	11,238
FY 2015	3,348	167	4,797	8,312	704	N/A	704	9,016
FY 2016	2,262	206	4,693	7,161	550	N/A	550	7,711

11-D-801-03 Phase C: Glovebox #3, Exhaust Stack, UPS, Criticality Alarm System, Vault Water Tanks, and PF-7 Demolition[a]

(dollars in thousands)

	TEC, Design 06-D-140	TEC, Design 11-D-801	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2012	5,326	9,998	33,226	43,224	14,413	N/A	14,413	62,963
FY 2013	8,507	5,421	46,652	60,580	14,000	428	14,428	75,008
FY 2014	8,507	8,407	43,666	60,580	14,000	428	14,428	75,008
FY 2015	8,507	8,407	55,526	72,440	13,565	866	14,431	86,871
FY 2016 PB	9,682	11,896	57,737	79,315	13,044	337	13,381	92,696

4. Project Scope and Justification

Scope

This project will enhance safety and enable cost effective operations so that the facility can continue to support critical Defense Programs missions and activities. LANL identified 20 potential subprojects at the pre-conceptual stage for upgrades and modernization. The subprojects were selected utilizing a risk-based prioritization process that considered the current condition of the equipment, risk of failure to the worker, the environment, and the public, and risk of failure to programmatic and facility operations. To meet mission need objectives within an operating nuclear facility, the TRP project is being executed as three separate, distinct capital line item projects, TRP I, TRP II, and TRP III.

TRP II Overall Scope: Consists of seven (7) subprojects to be completed in three phases:

1. Replacement of Uninterruptible Power Supply
2. Refurbishment of Air Dryers
3. Replacement of Confinement Doors
4. Replacement of Criticality Alarm System
5. Vault Water Tank Cooling System Upgrades
6. Seismic upgrades of Glovebox Stands
7. Upgrade Exhaust Stack Sampling System

Phase A: Glovebox Stand 1 and Air Dryers:

Air Dryers – Refurbish of Air Dryers.
Glovebox Stands Group 1 – Seismically upgrade the GB #1 stand.

Phase B: Glovebox Stand 2 and Confinement Doors:

Glovebox Stands Group 2 – Seismically upgrade the GB #2 stand.
Replace existing PF-4 Confinement doors.

Phase C: Glovebox Stand 3, Exhaust Stack, UPS, Criticality Alarm System, Vault Water Tanks, and PF-7 Demolition

Glovebox Stands Group 3 – Seismically upgrade the GB #3 stands.
Upgrade the sampling system for existing PF-4 exhaust stacks.
PF-7 demolition to prepare for uninterruptable power supply installation.
Replace existing Uninterruptible Power Supply.
Upgrade Vault water tanks cooling system.
Replace existing Criticality Alarm System in PF-4.

Justification

The LANL Plutonium Facility (PF-4) is a major facility and infrastructure systems are aging and approaching the end of their service life, and, as a consequence, are beginning to require excessive maintenance. As a result, the facility is experiencing increased operating costs and reduced system reliability. Compliance with increases in safety and regulatory requirements

[a] The numbers are consistent with the approved TRP II Phase CD 2/3 Package.

is critical to mission essential operations, and thus becoming more costly and cumbersome to maintain due to the physical conditions of facility support systems and equipment.

Risks

Risk Driver	Handling Strategy
Ongoing facility and program operations in PF-4 have the potential to impact TRP II execution	Mitigate: The project team completed interface agreements with the facility to ensure TRP II work has been integrated with TA-55 Programmatic, Operations and Maintenance activities
Changing requirements for nuclear safety, quality assurance and security status could impact project planning	Mitigate: The project will track requirement changes and will review any potential impacts with senior NNSA management through change control process.
CR related funding issues may impact project execution	Mitigate. Continue to work with NNSA senior management to ensure funding requirements are met in time to support TRP II execution.
Unfavorable market/bidding environment	Mitigate: Continually monitor risks and find opportunities, if feasible, to improve execution.

The project is being conducted in accordance with the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets.

Funds appropriated under this data sheet may be used to provide independent assessments of the planning and execution of this line item project.

5. Financial Schedule

11-D-801-01 Phase A: Glovebox #1 and Air Dryers

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design (06-D-140-02)			
FY 2008	N/A	N/A	24
FY 2009	N/A	N/A	1,260
FY 2010	N/A	N/A	929
FY 2011	N/A	N/A	499
FY 2012	N/A	N/A	89
Total, Design (06-D-140-02)	N/A	N/A	2,801
Design (11-D-801)			
FY 2011	N/A	N/A	53
FY 2012	N/A	N/A	397
Total, Design (11-D-801)	N/A	N/A	450
Total, Design	N/A	N/A	3,251
Construction (11-D-801)			
FY 2012	N/A	N/A	5,799
FY 2013	N/A	N/A	1,938
Total, Construction	N/A	N/A	7,737
TEC			
FY 2008	N/A	N/A	24
FY 2009	N/A	N/A	1,260
FY 2010	N/A	N/A	929
FY 2011	N/A	N/A	552
FY 2012	N/A	N/A	6,285
FY 2013	N/A	N/A	1,938
Total, TEC	N/A	N/A	10,988
Other Project Cost (OPC)			
OPC except D&D			
FY 2008	N/A	N/A	10
FY 2009	N/A	N/A	40
FY 2010	N/A	N/A	50
FY 2011	N/A	N/A	50
FY 2012	N/A	N/A	45
FY 2013	N/A	N/A	336
Total, OPC except D&D	N/A	N/A	531

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Project Cost (TPC)			
FY 2008	N/A	N/A	34
FY 2009	N/A	N/A	1,300
FY 2010	N/A	N/A	979
FY 2011	N/A	N/A	602
FY 2012	N/A	N/A	6,330
FY 2013	N/A	N/A	2,274
Total, TPC	N/A	N/A	11,519

11-D-801-02 Phase B: Glovebox 2 and Confinement Doors

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design (06-D-140-02)			
FY 2009	N/A	N/A	500
FY 2010	N/A	N/A	548
FY 2011	N/A	N/A	1,212
FY 2012	N/A	N/A	2
Total, Design (06-D-140-02)	N/A	N/A	2,262
Design (11-D-801)			
FY 2011	N/A	N/A	39
FY 2012	N/A	N/A	167
Total, Design (11-D-801)	N/A	N/A	206
Total, Design	N/A	N/A	2,468
Construction (11-D-801)			
FY 2012	N/A	N/A	2,518
FY 2013	N/A	N/A	2,229
FY 2014	N/A	N/A	-54
Total, Construction	N/A	N/A	4,693
TEC			
FY 2009	N/A	N/A	500
FY 2010	N/A	N/A	548
FY 2011	N/A	N/A	1,251
FY 2012	N/A	N/A	2,687
FY 2013	N/A	N/A	2,229
FY 2014	N/A	N/A	-54
Total, TEC	N/A	N/A	7,161
Other Project Cost (OPC)			
OPC except D&D			
FY 2008	N/A	N/A	10
FY 2009	N/A	N/A	40
FY 2010	N/A	N/A	50
FY 2011	N/A	N/A	50

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2012	N/A	N/A	50
FY 2013	N/A	N/A	350
Total, OPC except D&D	N/A	N/A	550
Total Project Cost (TPC)			
FY 2008	N/A	N/A	10
FY 2009	N/A	N/A	540
FY 2010	N/A	N/A	598
FY 2011	N/A	N/A	1,301
FY 2012	N/A	N/A	2,737
FY 2013	N/A	N/A	2,579
FY 2014	N/A	N/A	-54
Total, TPC	N/A	N/A	7,711

11-D-801-03 Phase C: Glovebox 3, Exhaust Stack, UPS, Criticality Alarm System, Vault Water Tanks, and PF-7 Demolition

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design (06-D-140-02)			
FY 2008	N/A	N/A	24
FY 2009	N/A	N/A	2,120
FY 2010	N/A	N/A	4,072
FY 2011	N/A	N/A	3,267
FY 2012	N/A	N/A	58
FY 2013	N/A	N/A	-2
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	143
Total, Design (06-D-140-02)	N/A	N/A	9,682
Design (11-D-801)			
FY 2011	N/A	N/A	79
FY 2012	N/A	N/A	212
FY 2013	N/A	N/A	7,238
FY 2014	N/A	N/A	4,367
Total, Design (11-D-801)	N/A	N/A	11,896
Total, Design	N/A	N/A	21,578

(dollars in thousands)

	Appropriations	Obligations	Costs
Construction (11-D-801)			
FY 2014	N/A	N/A	932
FY 2015	N/A	N/A	30,317
FY 2016	N/A	N/A	22,918
FY 2017	N/A	N/A	3,570
Total, Construction	N/A	N/A	57,737
TEC			
FY 2008	N/A	N/A	24
FY 2009	N/A	N/A	2,120
FY 2010	N/A	N/A	4,072
FY 2011	N/A	N/A	3,346
FY 2012	N/A	N/A	270
FY 2013	N/A	N/A	7,236
FY 2014	N/A	N/A	5,299
FY 2015	N/A	N/A	30,460
FY 2016	N/A	N/A	22,918
FY 2017	N/A	N/A	3,570
Total, TEC	N/A	N/A	79,315
Other Project Cost (OPC)			
OPC except D&D			
FY 2005	N/A	N/A	853
FY 2006	N/A	N/A	1,918
FY 2007	N/A	N/A	980
FY 2008	N/A	N/A	1,322
FY 2009	N/A	N/A	10
FY 2010	N/A	N/A	219
FY 2011	N/A	N/A	1,761
FY 2012	N/A	N/A	443
FY 2013	N/A	N/A	357
FY 2014	N/A	N/A	241
FY 2015	N/A	N/A	1,071
FY 2016	N/A	N/A	3,015
FY 2017	N/A	N/A	854
Total, OPC except D&D	N/A	N/A	13,044
D&D			
FY 2015	N/A	N/A	337
Total, D&D	N/A	N/A	337

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total OPC			
FY 2005	N/A	N/A	853
FY 2006	N/A	N/A	1,918
FY 2007	N/A	N/A	980
FY 2008	N/A	N/A	1,322
FY 2009	N/A	N/A	10
FY 2010	N/A	N/A	219
FY 2011	N/A	N/A	1,761
FY 2012	N/A	N/A	443
FY 2013	N/A	N/A	357
FY 2014	N/A	N/A	241
FY 2015	N/A	N/A	1,408
FY 2016	N/A	N/A	3,015
FY 2017	N/A	N/A	854
Total, OPC	N/A	N/A	13,381
Total Project Cost (TPC)			
FY 2005	N/A	N/A	853
FY 2006	N/A	N/A	1,918
FY 2007	N/A	N/A	980
FY 2008	N/A	N/A	1,346
FY 2009	N/A	N/A	2,130
FY 2010	N/A	N/A	4,291
FY 2011	N/A	N/A	5,107
FY 2012	N/A	N/A	713
FY 2013	N/A	N/A	7,593
FY 2014	N/A	N/A	5,540
FY 2015	N/A	N/A	31,868
FY 2016	N/A	N/A	25,933
FY 2017	N/A	N/A	4,424
Total, TPC	N/A	N/A	92,696

Total Project

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design (06-D-140-02)			
FY 2008	1,500	1,500	48
FY 2009	8,245	8,245	3,880
FY 2010	5,000	5,000	5,549
FY 2011	0	0	4,978
FY 2012	0	0	149
FY 2013	0	0	-2
FY 2014	0	0	0
FY 2015	0	0	143
Total, Design (06-D-140-02)	14,745	14,745	14,745
Design (11-D-801)			
FY 2011	N/A	N/A	171
FY 2012	N/A	N/A	776
FY 2013	N/A	N/A	7,238
FY 2014	N/A	N/A	4,367
FY 2015			0
Total, Design (11-D-801)	N/A	N/A	12,552
Total, Design	N/A	N/A	27,297
Construction (11-D-801)			
FY 2011	N/A	N/A	0
FY 2012	N/A	N/A	8,317
FY 2013	N/A	N/A	4,167
FY 2014	N/A	N/A	878
FY 2015	N/A	N/A	30,317
FY 2016	N/A	N/A	22,918
FY 2017	N/A	N/A	3,570
Total, Construction	N/A	N/A	70,167
TEC			
FY 2008	1,500	1,500	48
FY 2009	8,245	8,245	3,880
FY 2010	5,000	5,000	5,549
FY 2011	19,960	19,960	5,149
FY 2012	10,000	10,000	9,242
FY 2013 [a]	8,177	8,177	11,403
FY 2014	30,679	30,679	5,245
FY 2015	10,000	10,000	30,460
FY 2016	3,903	3,903	22,918
FY 2017	0	0	3,570
Total, TEC	97,464	97,464	97,464

[a] The actual FY 2013 appropriation was $8,889. This was reduced by $712 due to the across the board rescission and government-wide sequestration.

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Other Project Cost (OPC)			
OPC except D&D			
FY 2005	N/A	N/A	853
FY 2006	N/A	N/A	1,918
FY 2007	N/A	N/A	980
FY 2008	N/A	N/A	1,342
FY 2009	N/A	N/A	90
FY 2010	N/A	N/A	319
FY 2011	N/A	N/A	1,861
FY 2012	N/A	N/A	538
FY 2013	N/A	N/A	1,043
FY 2014	N/A	N/A	241
FY 2015	N/A	N/A	1,071
FY 2016	N/A	N/A	3,015
FY 2017	N/A	N/A	854
Total, OPC except D&D	N/A	N/A	14,125
D&D			
FY 2015	N/A	N/A	337
Total, D&D	N/A	N/A	337
OPC			
FY 2005	853	853	853
FY 2006	1,918	1,918	1,918
FY 2007	980	980	980
FY 2008	1,342	1,342	1,342
FY 2009	90	90	90
FY 2010	319	319	319
FY 2011	1,861	1,861	1,861
FY 2012	538	538	538
FY 2013	1,043	1,043	1,043
FY 2014	270	270	241
FY 2015	1,208	1,208	1,408
FY 2016	3,015	3,015	3,015
FY 2017	1,025	1,025	854
Total, OPC	14,462	14,462	14,462
Total Project Cost (TPC)			
FY 2005	853	853	853
FY 2006	1,918	1,918	1,918
FY 2007	980	980	980
FY 2008	2,842	2,842	1,390
FY 2009	8,335	8,335	3,970
FY 2010	5,319	5,319	5,868
FY 2011	21,821	21,821	7,010
FY 2012	10,538	10,538	9,780

(dollars in thousands)

	Appropriations	Obligations	Costs
FY 2013	9,220	9,220	12,446
FY 2014	30,949	30,949	5,486
FY 2015	11,208	11,208	31,868
FY 2016	6,918	6,918	25,933
FY 2017	1,025	1,025	4,424
Total, TPC	111,926	111,926	111,926

6. Details of Project Cost Estimate

11-D-801-01 Phase A: Glovebox #1 and Air Dryers

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (PED) (06-D-140-02)	2,801	2,890	3,330
Federal Project Support			
Contingency	0	0	370
Final Design (11-D-801)	450	568	1,200
Federal Project Support			
Final Design Contingency	0		300
Total Design	3,251	3,458	5,200
Construction			
Site Preparation			
Equipment			
Other Construction	7,737	9,351	10,680
Federal Project Support			
Contingency		0	3,150
Total, Construction	7,737	9,351	13,830
Total, TEC	10,988	12,809	19,030
Contingency, TEC	0	0	3,820
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning			
Conceptual Design			
Start-up	531	482	410
Contingency		13	30
Total, OPC except D&D	531	495	440
D&D			
D&D			
Contingency			
Total, D&D	0	0	0
Total, OPC	531	495	440
Contingency, OPC	0	13	30
Total, TPC	11,519	13,304	19,470
Total, Contingency	0	13	3,850

11-D-801-02 Phase B: Glovebox 2 and Confinement Doors

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (PED) (06-D-140-02)	2,262	3,348	3,542
Federal Project Support			
Contingency		0	400
Final Design (11-D-801)	206	167	1,600
Federal Project Support			
Final Design Contingency			350
Total Design	2,468	3,515	5,892
Construction			
Site Preparation			
Equipment			
Other Construction	4,693	4,797	8,266
Federal Project Support			
Contingency		0	3,424
Total, Construction	4,693	4,797	11,690
Total, TEC	7,161	8,312	17,582
Contingency, TEC	0	0	4,174
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning			
Conceptual Design			
Start-up	550	642	574
Contingency		62	47
Total, OPC except D&D	550	704	621
D&D			
D&D			
Contingency			
Total, D&D	0	0	0
Total, OPC	550	704	621
Contingency, OPC	0	62	47
Total, TPC	7,711	9,016	18,203
Total, Contingency	0	62	4,221

11-D-801-03 Phase C: Glovebox 3, Exhaust Stack, UPS, Criticality Alarm System, Vault Water Tanks, and PF-7 Demolition

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (PED) (06-D-140-02)	9,540	8,365	9,540
Federal Project Support	142	142	142
Contingency	0	0	0
Final Design (11-D-801)	11,896	7,907	11,896
Federal Project Support		500	
Final Design Contingency	0	0	0
Total Design	21,578	16,914	21,578
Construction			
Site Preparation			
Equipment			
Other Construction	46,624	44,187	47,054
Federal Project Support	2,857	2,500	2,857
Contingency	8,256	8,839	7,826
Total, Construction	57,737	55,526	57,737
Total, TEC	79,315	72,440	79,315
Contingency, TEC	8,256	8,839	7,826
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning			
Conceptual Design	4,990	5,071	4,990
Start-up	8,054	6,621	8,054
Contingency		1,873	
Total, OPC except D&D	13,044	13,565	13,044
D&D			
D&D	337	700	337
Contingency		166	
Total, D&D	337	866	337
Total, OPC	13,381	14,431	13,381
Contingency, OPC	0	2,039	0
Total, TPC	92,696	86,871	92,696
Total, Contingency	8,256	10,878	7,826

Total Project

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (PED) (06-D-140-02)	14,603	14,603	14,603
Federal Project Support	142	142	142
Contingency	0	0	0
Final Design (11-D-801)	12,552	8,642	12,982
Federal Project Support		500	0
Final Design Contingency	0	0	0
Total Design	27,297	23,887	27,727
Construction			
Site Preparation	0	0	0
Equipment	0	0	0
Other Construction	59,054	58,335	59,054
Federal Project Support	2,857	2,500	2,857
Contingency	8,256	8,839	7,826
Total, Construction	70,167	69,674	69,737
Total, TEC	97,464	93,561	97,464
Contingency, TEC	8,256	8,839	7,826
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	0
Conceptual Design	4,990	5,071	4,990
Start-up	9,135	7,745	9,335
Contingency	0	1,948	0
Total, OPC except D&D	14,125	14,764	14,325
D&D			
D&D	337	700	137
Contingency		166	0
Total, D&D	337	866	137
Total, OPC	14,462	15,630	14,462
Contingency, OPC	0	2,114	0
Total, TPC	111,926	109,191	111,926
Total, Contingency	8,256	10,953	7,826

7. Schedule of Appropriation Requests

(dollars in thousands)

		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Outyears	Total
FY 2011	TEC	94,013	42,480	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	14,788	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	88,333	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FY 2012	TEC	71,599	12,500	0	0	0	0	0	0	84,099
	OPC	12,367	2,200	910	0	0	0	0	0	15,477
	TPC	83,966	14,700	910	0	0	0	0	0	99,576
FY 2013	TEC	84,273	0	0	0	0	0	0	0	84,273
	OPC	11,689	2,125	806	1,007	0	0	0	0	15,627
	TPC	95,962	2,125	806	1,007	0	0	0	0	99,900
FY 2014	TEC	84,273	0	0	0	0	0	0	0	84,273
	OPC	11,523	2,125	1,000	979	0	0	0	0	15,627
	TPC	95,796	2,125	1,000	979	0	0	0	0	99,900
FY 2015	TEC	83,561	10,000	0	0	0	0	0	0	84,273
	OPC	11,523	2,125	1,000	982	0	0	0	0	15,627
	TPC	95,084	12,125	1,000	982	0	0	0	0	99,900
FY 2016	TEC	83,557	10,000	3,903	0	0	0	0	0	97,460
	OPC	9,219	1,208	3,015	1,025	0	0	0	0	14,467
	TPC	92,776	11,208	6,918	1,025	0	0	0	0	111,927

8. Related Operations and Maintenance Funding Requirements

Start of Operation of Beneficial Occupancy (fiscal quarter or date)	4Q FY 2017
Expected Useful Life (number of years)	25
Expected Future Start of D&D of this capital asset (fiscal quarter)	4Q FY 2042

(Related Funding Requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	N/A	N/A	N/A	N/A
Maintenance	N/A	N/A	N/A	N/A
Total, Operations and Maintenance	N/A	N/A	N/A	N/A

9. D&D Information

The new area being constructed in this project is not replacing existing facilities.

	Square Feet
New area being constructed by this project at LANL……	1,200
Area of D&D in this project at LANL……	1,200
Area at LANL to be transferred, sold, and/or D&D outside the project including area previously "banked"……	0
Area of D&D in this project at other sites……	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"……	0
Total area eliminated ……	1,200

Name/s and site location/s of existing facility/ies to be D&D by this project:
LANL; Partial PF-7 structure; 1,200 sq ft

Uninterruptible Power Supply is planned to be relocated immediately outside of the existing structure (this represents demolition of the 1,200 square feet PF-7 structure).

10. Acquisition Approach

Design and Construction Management will be implemented by Los Alamos National Security, LLC through the LANL Management and Operating Contract. The TRP Acquisition Strategy is based on tailored procurement strategies for each subproject in order to mitigate risks. The TRP subprojects will be implemented via LANL-issued final design/construction contracts based on detailed performance requirements/specifications developed during the preliminary design phase.

07-D-220, Radioactive Liquid Waste Treatment Facility Upgrade Project,
Los Alamos National Laboratory (LANL), Los Alamos, New Mexico
Project is for Construction Only

1. Significant Changes and Summary

Significant Changes
This Construction Project Data Sheet (CPDS) is an update of the Fiscal Year (FY) 2014 Updated CPDS and does not include a new start for the budget year.

The Low Level Liquid Waste Facility subproject completed design, received approval of its performance baseline (CD-2), and start of construction (CD-3). The LLW awarded the construction contract in December 2014.

Summary
The most recent DOE O 413.3B approved Critical Decision (CD) is CD-3, Approve Start of Construction for the Low Level Liquid Waste Treatment Facility Subproject, which was approved on September 26, 2014 with Total Project Cost (TPC) of $82,694 and CD-4 date of May 31, 2018.

A Federal Project Director at the appropriate level has been assigned to this project and has approved this CPDS.

07-D-220-01: Single Nuclear Facility
As discussed below, this subproject was cancelled. Remaining funding was moved to other subprojects within the overall project. The subproject costs have been adjusted since the FY 2014 budget submittal.

07-D-220-02: Zero Liquid Discharge (ZLD)
The most recent DOE O 413.3B approved CD for the ZLD Phase is CD-4, Approve Project Closeout, which was approved on October 19, 2012. The subproject costs have been adjusted since the FY 2014 budget submittal to reflect the final costs.

07-D-220-03: Low Level Liquid Waste (LLW) Facility
The most recent DOE O 413.3B approved CD for the LLW Facility is CD-3, Approve Start of Construction, which was approved on September 26, 2014 with TPC of $82,694 and CD-4 date of May 31, 2018. The baseline TPC is higher than what was shown on the FY 2014 budget request because the project did not have an approved baseline. An Independent Cost Estimate was completed upon design completion as part of the CD-2 approval process and recommended higher contingency funds, the design is 100% complete, and the project is ready for start of construction now that it has received CD-3 approval. Consistent with the approved project baseline, the TEC funds requested in FY 2016 are needed to increase contingency to mitigate potential risks such as higher bids and lessons-learned from the Waste Isolation Pilot Plant incident.

07-D-220-04: Transuranic Liquid Waste (TLW) Facility
This subproject was appropriated as a separate line item, 07-D-220-04, and is no longer funded under this PDS.

This project will replace the following radioactive liquid waste (RLW) treatment capabilities at LANL and reduce the liquid discharge to Mortandad Canyon:

1) LLW treatment of up to 5 million liters each year;
2) Secondary waste treatment; and
3) RLW discharge system/Zero Liquid Discharge (ZLD) system.

2. Critical Milestone History

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2007			1QFY2006		4QFY2007	1QFY2008	2QFY2012	1QFY2010
FY 2008			3QFY2006		2QFY2008	3QFY2008	4QFY2012	3QFY2010
FY 2009	10/04/2004		06/05/2006	2QFY2008	3QFY2008	3QFY2008	4QFY2012	3QFY2010
FY 2014	10/04/2004		09/16/2011	4QFY 2016	1QFY 2017	1Q FY 2017	N/A	4Q FY 2020
FY 2014 Update	10/04/2004		09/23/2013	5/21/2014	3/31/2014	9/26/2014	N/A	3Q FY 2018
FY 2016 PB	10/04/2004	6/05/2006	09/23/2013[a]	5/21/2014	3/31/2014	9/26/2014	N/A	3Q FY 2018

07-D-220-01: Single Nuclear Facility[b]

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	10/04/2004		06/05/2006	N/A	10/30/2011	N/A	N/A	N/A
FY 2016	10/04/2004	6/05/2006	06/05/2006	N/A	10/30/2011	N/A	N/A	N/A

07-D-220-02: Zero Liquid Discharge

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	10/04/2004		06/05/2006	11/22/2006	04/21/2011	04/21/2011	N/A	10/19/2012
FY 2016	10/04/2004	11/22/2006	06/05/2006	11/22/2006	04/21/2011	04/21/2011	N/A	10/19/2012

07-D-220-03: Low Level Liquid Waste

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	10/04/2004		09/16/2011	2QFY 2014	2QFY 2014	2Q FY 2014	N/A	1Q FY 2017
FY 2014 Update	10/04/2004		09/23/2013	5/21/2014	3/31/2014	9/26/2014	N/A	3Q FY 2018
FY 2016 PB	10/04/2004	9/23/2013	09/23/2013	5/21/2014	3/31/2014	9/26/2014	N/A	3Q FY 2018

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

[a] Revised CD-1.
[b] Abandoned due to increased costs.

3. Project Cost History

	TEC Design (06-D-140-03)	TEC Design 07-D-220	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2007	NA	NA	NA	61,100	6,200	8,700		76,000
FY 2008	NA	NA	NA	72,600	15,000	9,000		96,600
FY 2009	11,100	NA	61,410	72,510	15,000	0	15,000	87,510
FY 2010	24,100	NA	TBD	TBD	TBD	0	TBD	TBD
FY 2014	37,492	20,546	124,384	182,422	29,078	0	29,078	211,500
FY 2014 Update PB	37,492	0	64,147	101,639	17,488	0	17,488	119,127
FY 2016	37,492	0	64,147	101,639	17,488	0	17,488	119,127

07-D-220-01: Single Nuclear Facility

	TEC Design (06-D-140-03)	TEC Design 07-D-220	TEC Construction, Total	TEC Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2014	23,339	0	0	23,339	5,377	0	5,377	28,716
FY 2014 Update	23,066	0	0	23,066	5,377	0	5,377	28,443
FY 2016	23,066	0	0	23,066	5,377	0	5,377	28,443

07-D-220-02: Zero Liquid Discharge

	TEC Design (06-D-140-03)	TEC Design 07-D-220	TEC Construction, Total	TEC Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2014	684	0	6,944	7,628	347	0	347	7,975
FY 2014 Update	957	0	6,610	7,567	423	0	423	7,990
FY 2016	957	0	6,610	7,567	423	0	423	7,990

07-D-220-03: Low Level Liquid Waste (LLW)

	TEC Design (06-D-140-03)	TEC Design 07-D-220	TEC Construction, Total	TEC Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2014	13,469	0	43,170	56,639	10,574	0	10,574	67,213
FY 2014 Update PB	13,469	0	57,537	71,006	11,688	0	11,688	82,694
FY 2016	13,469	0	57,537	71,006	11,688	0	11,688	82,694

4. Project Scope and Justification

Scope

This project will replace at a minimum the following RLW treatment capabilities at LANL and reduce the liquid discharge to Mortandad Canyon:

1) LLW treatment of up to 5 million liters each year;
2) Secondary waste treatment; and
3) RLW discharge system/Zero Liquid Discharge (ZLD) system.

The replacement is needed to remediate significant deficiencies associated with the existing RLW treatment capabilities that pose a threat to the long-term availability of this function. The replacement is ultimately aimed at providing an RLW treatment capability that is safe, reliable, and effective for the next 50 years in support of primary missions at LANL.

07-D-220-01: Single Facility Nuclear Subproject
Initial planning and design was based on a combined single hazard category 2 nuclear facility to treat both the low level and transuranic liquid wastes. The scope included a two-story high reinforced concrete building approximately 20,000 gross square feet in area. As explained above, due to a number of reasons beyond the controls of the project team, the design was abandoned for cheaper alternative that would meet the mission need.

07-D-220-02: Zero Liquid Discharge Subproject
The scope included construction of large, ground-level concrete evaporation tank that can store up to 5 million liters of liquid that will be discharged from the treatment facilities. In addition, the scope included a transfer line to transport treated liquid from the processing facility to the evaporation tank and a small pump house to transfer back water from the evaporation tank to the facility for further treatment before it could be discharged to the nearby canyon, if needed to meet ground water discharge permit requirements.

07-D-220-03: Low Level Liquid Waste Subproject
The scope includes constructing a single-story reinforced concrete building, approximately 8,000 square feet in area, to house both the processing equipment for treating up to 5 million liters of low level liquid waste, a small control room, laboratory, separate utility building, and other necessary functioning, and two 10,000 gallon effluent tanks. This project is a "like-for-like" replacement of the capability currently provided in the existing RLWTF. The separate utility building will be provided to house mechanical and electrical equipment.

07-D-220-04: Transuranic Liquid Waste Subproject
This subproject was appropriated as a separate line item, 07-D-220-04, and is no longer funded under this CPDS.

Justification
Significant portions of the RLW system are almost 50 years old and their reliability is significantly diminished. The transuranic storage tank failure demonstrated the inability of RLW components to remain in service beyond their design life and exemplified the high cost of repair. The existing treatment facility is in need of significant upgrades in order to comply with current codes and standards including International Building Code, seismic design/construction codes and the National Electric Code (NEC). Operations and safety reviews have highlighted the need for enhanced seismic conformance for the existing facility. Continuous workarounds are required to keep systems running and excessive corrosion threatens system availability. Degraded and outdated facility systems pose elevated risk to workers.

The project is being conducted in accordance with the project management requirements in DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets.

Funds appropriated under this data sheet may be used to provide independent assessments of the planning and execution of this project.

Construction funds will not be used until approval of Critical Decision 3, Approve Start of Construction, except procuring long-lead equipment if necessary.

5. Financial Schedule

07-D-220-01: Single Nuclear Facility Subproject

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2006	N/A	N/A	362
FY 2007	N/A	N/A	6,020
FY 2008	N/A	N/A	3,341
FY 2009	N/A	N/A	8,937
FY 2010	N/A	N/A	4,406
Total, Design (06-140-03)	N/A	N/A	23,066
Construction			
	N/A	N/A	0
Total, Construction	N/A	N/A	0
TEC			
FY 2006	N/A	N/A	362
FY 2007	N/A	N/A	6,020
FY 2008	N/A	N/A	3,341
FY 2009	N/A	N/A	8,937
FY 2010	N/A	N/A	4,406
Total, TEC	N/A	N/A	23,066
Other Project Cost (OPC)			
OPC except D&D			
FY 2005	N/A	N/A	2,028
FY 2006	N/A	N/A	2,137
FY 2007	N/A	N/A	990
FY 2008	N/A	N/A	212
FY 2009	N/A	N/A	10
Total, OPC except D&D	N/A	N/A	5,377
Total Project Cost (TPC)			
FY 2005	N/A	N/A	2,028
FY 2006	N/A	N/A	2,499
FY 2007	N/A	N/A	7,010
FY 2008	N/A	N/A	3,553
FY 2009	N/A	N/A	8,947
FY 2010	N/A	N/A	4,406
Total, TPC	N/A	N/A	28,443

07-D-220-02: Zero Liquid Discharge Subproject

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2010	N/A	N/A	957
Total, Design (06-D-140-03)	N/A	N/A	957
Construction			
FY 2011	N/A	N/A	1,707
FY 2012	N/A	N/A	4,569
FY 2013	N/A	N/A	332
FY 2014	N/A	N/A	2
Total, Construction	N/A	N/A	6,610
TEC			
FY 2010	N/A	N/A	957
FY 2011	N/A	N/A	1,707
FY 2012	N/A	N/A	4,569
FY 2013	N/A	N/A	332
FY 2014	N/A	N/A	2
Total, TEC	N/A	N/A	7,567
Other Project Cost (OPC)			
OPC except D&D			
FY 2012	N/A	N/A	254
FY 2013	N/A	N/A	167
FY 2014	N/A	N/A	2
Total, OPC except D&D	N/A	N/A	423
Total Project Cost (TPC)			
FY 2010	N/A	N/A	957
FY 2011	N/A	N/A	1,707
FY 2012	N/A	N/A	4,823
FY 2013	N/A	N/A	499
FY 2014	N/A	N/A	4
Total, TPC	N/A	N/A	7,990

07-D-220-03: Low Level Liquid Waste Subproject

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2010	N/A	N/A	2,103
FY 2011	N/A	N/A	741
FY 2012	N/A	N/A	5,697
FY 2013	N/A	N/A	2,309
FY 2014	N/A	N/A	2,427
FY 2015	N/A	N/A	192
Total, Design (06-D-140-03)	N/A	N/A	13,469
Construction			
FY 2014	N/A	N/A	274
FY 2015	N/A	N/A	35,510
FY 2016	N/A	N/A	15,000
FY 2017	N/A	N/A	6,753
Total, Construction	N/A	N/A	57,537
TEC			
FY 2010	N/A	N/A	2,103
FY 2011	N/A	N/A	741
FY 2012	N/A	N/A	5,697
FY 2013	N/A	N/A	2,309
FY 2014	N/A	N/A	2,701
FY 2015	N/A	N/A	35,702
FY 2016	N/A	N/A	15,000
FY 2017	N/A	N/A	6,753
Total, TEC	N/A	N/A	71,006
Other Project Cost (OPC)			
OPC except D&D			
FY 2009	N/A	N/A	1,448
FY 2010	N/A	N/A	1,955
FY 2011	N/A	N/A	1,955
FY 2012	N/A	N/A	444
FY 2013	N/A	N/A	487
FY 2014	N/A	N/A	531
FY 2015	N/A	N/A	868
FY 2016	N/A	N/A	3,741
FY 2017	N/A	N/A	259
Total, OPC except D&D	N/A	N/A	11,688

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Project Cost (TPC)			
FY 2009	N/A	N/A	1,448
FY 2010	N/A	N/A	4,058
FY 2011	N/A	N/A	2,696
FY 2012	N/A	N/A	6,141
FY 2013	N/A	N/A	2,796
FY 2014	N/A	N/A	3,228
FY 2015	N/A	N/A	36,574
FY 2016	N/A	N/A	18,741
FY 2017	N/A	N/A	7,012
Total, TPC	N/A	N/A	82,694

Total Project

Total Estimated Cost (TEC)			
Design			
FY 2006	5,379	3,000	362
FY 2007	10,077	8,100	6,020
FY 2008	990	5,346	3,341
FY 2009	10,054	7,554	8,937
FY 2010	7,000	7,000	7,466
FY 2011	3,992	3,992	741
FY 2012	0	0	5,697
FY 2013	0	0	2,309
FY 2014	0	2,500	2,427
FY 2015	0	0	192
Total, Design (06-D-140-03)	37,492	37,492	37,492
Construction			
FY 2008	0	0	0
FY 2009	7,500	7,500	0
FY 2010	0	0	0
FY 2011	0	0	1,707
FY 2012	0	0	4,569
FY 2013	0	0	332
FY 2014	45,114	45,114	276
FY 2015	0	0	35,510
FY 2016	11,533	11,533	15,000
FY 2017	0	0	6,753
Total, Construction	64,147	64,147	64,147

(dollars in thousands)

	Appropriations	Obligations	Costs
TEC			
FY 2006	5,379	3,000	362
FY 2007	10,077	8,100	6020
FY 2008	990	5,346	3,341
FY 2009	17,554	15,054	8,937
FY 2010	7,000	7,000	7,466
FY 2011	3,992	3,992	2,448
FY 2012	0	0	10,266
FY 2013	0	0	2,641
FY 2014	45,114	47,614	2,703
FY 2015	0	0	35,702
FY 2016	11,533	11,533	15,000
FY 2017	0	0	6,753
Total, TEC	101,639	101,639	101,639
Other Project Cost (OPC)			
OPC except D&D			
FY 2005	2,028	2,028	2,028
FY 2006	2,137	2,137	2,137
FY 2007	990	990	990
FY 2008	212	212	212
FY 2009	1,458	1,458	1,458
FY 2010	1,955	1,955	1,955
FY 2011	1,955	1,955	1,955
FY 2012	698	698	698
FY 2013	654	654	654
FY 2014	533	533	533
FY 2015	868	868	868
FY 2016	3741	3,741	3,741
FY 2017	259	259	259
Total, OPC except D&D	17,488	17,488	17,488
TPC			
FY 2005	2,028	2,028	2,028
FY 2006	7,516	5,137	2,499
FY 2007	11,067	9,090	7,010
FY 2008	1,202	5,558	3,553
FY 2009	19,012	16,512	10,395
FY 2010	8,955	8,955	9,421
FY 2011	5,947	5,947	4,403
FY 2012	698	698	10,964
FY 2013	654	654	3,295

(dollars in thousands)

	Appropriations	Obligations	Costs
FY 2014	45,647	48,147	3,236
FY 2015	868	868	36,570
FY 2016	15,274	15,274	18,741
FY 2017	259	259	7,012
Total, TPC	119,127	119,127	119,127

6. Details of Project Cost Estimate

07-D-220-01: Single Nuclear Facility Subproject

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (06-D-140-03)	23,066	23,066	N/A
Contingency	0	0	N/A
Total Design	23,066	23,066	N/A
Construction			
Other Construction	0	0	N/A
Contingency	0	0	N/A
Total, Construction	0	0	N/A
Total, TEC	23,066	23,066	N/A
Contingency, TEC	0	0	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	N/A
Conceptual Design	0	0	N/A
Safety Basis & Design Support	5,377	5,377	N/A
Start-up	0	0	N/A
Contingency	0	0	N/A
Total, OPC except D&D	5,377	5,377	N/A
Total, OPC	5,377	5,377	N/A
Contingency, OPC	0	0	N/A
Total, TPC	28,443	28,443	N/A
Total, Contingency	0	0	N/A

07-D-220-02: Zero Liquid Discharge Subproject

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (06-D-140-03)	957	957	684
Contingency	0	0	0
Total Design	957	957	684
Construction			
Other Construction	6,610	6,610	7,287
Contingency	0	0	1,458
Total, Construction	6,610	6,610	8,745
Total, TEC	7,567	7,567	9,429
Contingency, TEC	0	0	1,458
Other Project Cost (OPC)			
OPC except D&D			
Start-up	423	423	150
Contingency	0	0	0
Total, OPC except D&D	423	423	150
Total, OPC	423	423	150
Contingency, OPC	0	0	0
Total, TPC	7,990	7,989	9,579
Total, Contingency	0	0	1,458

07-D-220-03: Low Level Liquid Waste Subproject

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate[a]	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design (06-D-140-03)	13,269	13,269	13,469
Contingency (06-D-140-03)	200	200	200
Design (07-D-220)	0	0	0
Total, Design	13,469	13,469	13,469
Construction			
Other Construction	36,153	36,153	36,153
Construction Support (Federal)	3,000	3,000	3,000
Contingency	18,384	18,384	18,384
Total, Construction	57,537	57,537	57,537
Total, TEC	71,006	71,006	71,006
Contingency, TEC	18,584	18,584	18,384
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning &	1,370	1,370	1,370
Conceptual Design	4,067	4,067	4,067
Safety Basis and Design Support	265	265	265
Start-Up	5,141	5,141	5,141
Contingency	845	845	845
Total, OPC except D&D	11,688	11,688	11,688
Total, OPC	11,688	11,688	11,688
Contingency, OPC	845	845	845
Total, TPC	82,694	82,694	82,694
Contingency, TPC	19,429	19,429	19,429

[a] From FY 2014 Update CPDS

Total Project

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate[a]	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design (06-D-140-03)	37,292	37,292	N/A
Contingency (06-D-140-03)	200	200	N/A
Design (07-D-220)	0	0	N/A
Design Support (07-D-220)			
Contingency (07-D-220)			
Total, Design	37,492	37,492	N/A
Contingency, Design	200	200	
Construction			
Other Construction	42,763	42,763	N/A
Construction Support (Federal)	3,000	3,000	N/A
Contingency	18,384	18,384	N/A
Total, Construction	64,147	64,147	N/A
Contingency, Construction	18,384	18,384	
Total, TEC	101,639	101,639	N/A
Contingency, TEC	18,584	18,584	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning &	1,596	1,596	N/A
Conceptual Design	8,007	8,007	N/A
Safety Basis and Design Support	1,476	1,476	N/A
Start-Up	5,564	5,564	N/A
Contingency	845	845	N/A
Total, OPC except D&D	17,488	17,488	N/A
Total, OPC	17,488	17,488	N/A
Contingency, OPC	845	845	N/A
Total, TPC	119,127	119,127	N/A
Contingency, TPC	19,429	19,429	N/A

[a] From FY 2014 Updated CPDS

7. Schedule of Appropriation Requests

(Dollars in Thousands)

Request		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	Outyears	Total
FY 2007	TEC	61,100	0	0	0	0	0	61,100
	OPC	14,900	0	0	0	0	0	14,900
	TPC	76,000	0	0	0	0	0	76,000
FY 2008	TEC	72,600	0	0	0	0	0	72,600
	OPC	24,000	0	0	0	0	0	24,000
	TPC	96,600	0	0	0	0	0	96,600
FY 2009	TEC	72,000	0	0	0	0	0	72,000
	OPC	15,000	0	0	0	0	0	15,000
	TPC	87,000	0	0	0	0	0	87,000
FY 2014	TEC	87,606	0	0	0	0	0	87,606
	OPC	13,611	2,346	341	0	0	0	16,298
	TPC	101,217	2,346	341	0	0	0	103,904
FY 2014 Update	TEC	90,106	0	11,533	0	0	0	101,639
	OPC	13,146	342	3,741	259	0	0	17,488
	TPC	103,252	342	15,274	259	0	0	119,127
FY 2016	TEC	90,106	0	11,533	0	0	0	101,639
	OPC	12,616	872	3,741	259	0	0	17,488
	TPC	102,722	872	15,274	259	0	0	119,127

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	2QFY2013
Expected Useful Life (number of years)	50
Expected Future Start of D&D of this capital asset (fiscal quarter)	2QFY2063

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	6,780	6,780	339,000	339,000
Maintenance	1,860	1,860	93,000	93,000
Total, Operations & Maintenance	8,640	8,640	432,000	432,000

9. D&D Information

The new area being constructed in this project is replacing existing facilities; however, the costs of D&D of the facilities that are being replaced are not included in the costs of this construction project. The one-for-one offset requirement will be met by utilizing site-banked square footage. A plan for D&D of the existing facility will be developed at the end of construction of the new facility when characterization data is available. D&D of the current facility is too far in the future for accurate cost estimates at this time.

	Square Feet
New area being constructed by this project at LANL……	10,000
Area of D&D in this project at LANL……	0
Area at LANL to be transferred, sold, and/or D&D outside the project including area previously "banked"……	10,000
Area of D&D in this project at other sites……..	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"……	0
Total area eliminated ……..	10,000

Name(s) and site location(s) of existing facility(s) to be replaced: Banked space will be used to meet one for one replacement.

10. Acquisition Approach

The ZLD sub-project was acquired through a firm-fixed price, design-build contract. Design services for the single nuclear facility and the LLW were obtained through competitively awarded contracts using a firm fixed price contract. Construction of the LLW facility is accomplished using a firm fixed price contracting approach.

07-D-220-04 Transuranic Liquid Waste (TLW) Treatment Facility Upgrade Project,
Los Alamos National Laboratory (LANL), Los Alamos, New Mexico
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update of the Fiscal Year (FY) 2015 CPDS and does not include a new start for the budget year.

The safety basis documents were previously included in Other Project Costs (OPC) estimates and have now been included within the Total Estimated Cost (TEC). To ensure accountability, and to prevent future cost increases for safety basis documentation, it was determined to be more cost-effective to have the documents developed by the design agency on a firm-fixed price contract, rather than by the Management & Operating (M&O) contractor as a cost reimbursable activity. As a result, the TEC has been increased from what was reported in the FY 2015 CPDS to pay for developing the safety basis documents. The OPC estimate in the FY 2015 CPDS was determined to be underestimated and is potentially still low. As design matures, the estimate will continue to be adjusted to reflect more up-to-date estimates for the design, construction, start-up activities and contingency.

To ensure a more stable and accurate baseline, the scheduled CD-2 has been delayed in favor of a joint CD-2/3. This will allow the project team ample time for an Independent Project Review (IPR) and resolution of any issues that may arise during that review.

A firm-fixed price contract was awarded for the design and safety basis development. The TEC, including the cost of the safety basis analysis is now estimated at $92,603.

Summary

The most recent DOE O 413.3B approved Critical Decision (CD) is the Revised CD-1, which was approved on September 23, 2013, with a Total Project Cost (TPC) top range of $96,033 and CD-4 date of 4Q FY 2020. Costs and schedule will be adjusted as the design and safety basis progresses to completion and the CD-2 package is finalized

A Federal Project Director has been assigned to this project and has approved this CPDS.

This project will design, construct, and start-up a new facility to treat transuranic liquid waste generated at the Plutonium Facility (PF-4) at the Los Alamos National Laboratory, the only facility in the nation capable and designated to produce pits for the enduring nuclear stockpile. Approval of the performance baseline will be granted upon the completion of the final design and Preliminary Documented Safety Analysis.

FY 2016 funding will be used to continue the design and safety basis analysis documents development and to prepare construction bid packages.

2. Critical Milestone History[a]

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	10/04/2004		09/16/2011	4Q FY 2016	1Q FY 2017	1Q FY 2017	N/A	4Q FY 2020
FY 2015	10/04/2004		09/23/2013	4Q FY 2016	1Q FY 2017	2Q FY 2017	N/A	4Q FY 2020
FY 2016	10/04/2004	09/23/2013	09/23/2013[b]	4Q FY 2017	1Q FY 2017	4Q FY 2017	N/A	4Q FY 2020

[a] The schedules are only estimates and consistent with the high end of the schedule ranges.
[b] Revised CD-1

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History[a]

	TEC, Design	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2014	20,546	74,270	94,816	12,780	0	12,780	107,596
FY 2015	25,605	60,000	85,605	10,428	0	10,428	96,033
FY 2016	25,605	66,997	92,602	10,428	0	10,428	103,030

4. Project Description, Justification, and Scope

Scope
The scope includes the design and construction to build a reinforced concrete structure to house the processing equipment, capable of treating up to 30,000 liters of transuranic liquid waste each year, which includes a TRU liquid influent storage, control room, labs, and a separate utility building. This new facility will be approximately 2,000 sq ft to 4,000 sq ft, hazard category 3 nuclear facility and will replace, at a minimum, the following existing capability:

1) Transuranic (TRU) liquid waste treatment;
2) TRU liquid influent storage.

Justification
The existing degraded and outdated treatment facility systems pose elevated risk to workers, public, and environment. Continuous workarounds are required to keep systems running and excessive corrosion threatens system availability. The replacement is needed to remediate significant deficiencies associated with the existing RLW treatment capabilities that pose a threat to the long-term availability of this function. The replacement is ultimately aimed at providing a RLW treatment capability that is safe, reliable, and effective for the next 50 years in support of primary missions at LANL. The new facility will be built to comply with the current codes, Nuclear Safety/Quality, standards including International Building Code, seismic design/construction codes and the National Electric Code (NEC).

The project is being executed in accordance with the project management requirements in DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets.

Funds appropriated under this data sheet may be used to provide independent assessments of the planning and execution of this project and for contracted support services to the federal project team for oversight and support.

[a] No construction, excluding for approved long lead procurement if necessary, will be performed until the project performance baseline has been validated and CD-3 has been approved.

5. Financial Schedule

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2014	N/A	N/A	641
FY 2015	N/A	N/A	15,000
FY 2016	N/A	N/A	8,952
FY 2017	N/A	N/A	1,012
Total, Design	N/A	N/A	25,605
Construction			
FY 2016	N/A	N/A	5,000
FY 2017	N/A	N/A	38,005
FY 2018	N/A	N/A	12,915
FY 2019	N/A	N/A	3,577
Total, Construction	N/A	N/A	59,497
TEC			
FY 2014	10,605	10,605	641
FY 2015[a]	7,500	7,500	15,000
FY 2016	40,949	40,949	13,952
FY 2017	17,053	17,053	39,017
FY 2018	8,995	8,995	12,915
FY 2019	0	0	3,577
Total, TEC	85,102	85,102	85,102
Other Project Cost (OPC)			
OPC except D&D (RTBF Ops of Facilities)			
FY 2014	3	3	3
Total, OPC except D&D (RTBF Ops of Facilities)	3	3	3
OPC except D&D (RTBF Recapitalization)			
FY 2015	654	654	654
FY 2016	2,061	2,061	2,061
FY 2017	1,500	1,500	1,500
FY 2018	1,500	1,500	1,500
FY 2019	2,000	2,000	2,000
FY 2020	2,710	2,710	2,710
Total, OPC except D&D (RTBF Recapitalization)	10,425	10,425	10,425

[a] FY 2015 request was $15,000. This was reduced by 7,500 in the Omnibus appropriation.

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total, OPC			
FY 2014	3	3	3
FY 2015	654	654	654
FY 2016	2,061	2,061	2,061
FY 2017	1,500	1,500	1,500
FY 2018	1,500	1,500	1,500
FY 2019	2,000	2,000	2,000
FY 2020	2,710	2,710	2,710
Total, OPC	10,428	10,428	10,428
Total Project Cost (TPC)			
FY 2014	10,608	10,608	644
FY 2015	8,154	8,154	15,654
FY 2016	43,010	43,010	16,013
FY 2017	18,553	18,553	40,517
FY 2018	10,495	10,495	14,415
FY 2019	2,000	2,000	5,577
FY 2020	2,710	2,710	2,710
Total, TPC	95,530	95,530	95,530

6. Details of Project Cost Estimate

	(dollars in thousands)		
	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	17,393	17,393	NA
Design Support (Federal) [a]	300	300	NA
Contingency	7,912	7,912	NA
Total, Design	25,605	25,605	NA
Total Design Contingency	7,912	7,912	NA
Construction			
Other Construction	36,737	36,737	NA
Safety Basis Documents[b]	6,997	0	NA
Construction Support (Federal) [a]	2,000	1,000	NA
Contingency	21,263	22,263	NA
Total, Construction	66,997	60,000	NA

[a] Needed for federal technical support through Independent Project Reviews required by DOE Order 413.3B and to conduct technical reviews of design and construction documents in support of the Federal Project Director.

[b] In the FY 2015 Estimate, Safety Basis Documents and Design Support were under one OPC line, Safety Basis and Design Support.

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total, TEC	92,602	85,605	NA
Contingency, TEC	29,175	30,175	NA
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning & Conceptual Design[b]	NA	NA	NA
Design Support[a]	2,041	5,041	NA
Start-Up	4,537	2,537	NA
Contingency	3,850	2,850	NA
Total, OPC except D&D	10,428	10,428	NA
D&D			
D&D	0	0	NA
Contingency	0	0	NA
Total, D&D	0	0	NA
Total, OPC	10,428	10,428	NA
Contingency, OPC	3,850	2,850	NA
			NA
Total, TPC	103,030	96,033	NA
Total, Contingency	33,025	33,025	NA

7. Schedule of Appropriation Requests

		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Out-Years	Total
FY 2014	TEC	15,466	14,255	56,332	0	0	0	0	0	86,053
	OPC	1,639	654	2,061	1,500	1,500	2,000	3,426	0	12,780
	TPC	17,105	14,909	58,393	1,500	1,500	2,000	3,426	0	98,833
FY 2015	TEC	10,605	15,000	60,000	0	0	0		0	85,605
	OPC	1,639	654	2,061	1,500	1,500	2,000	1,074	0	10,428
	TPC	12,244	15,654	62,061	1,500	1,500	2,000	1,074	0	96,033
FY 2016	TEC	10,605	7,500	40,949	17,053	8,995	0	0	0	85,102
	OPC	3	654	2,061	1,500	1,500	2,000	2,710	0	10,428
	TPC	10,608	8,154	43,010	18,553	10,495	2,000	2,710	0	95,530

[a] In the FY 2015 Estimate, Safety Basis Documents and Design Support were under one OPC line, Safety Basis and Design Support.

[b] Conceptual design cost is part or the RLWTF Upgrade Project (07-D-220).

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	2QFY2020
Expected Useful Life (number of years)	50
Expected Future Start of D&D of this capital asset (fiscal quarter)	2QFY2070

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	1,400	TBD	70,000	TBD
Utilities	50	TBD	2,500	TBD
Maintenance & Repair	400	TBD	20,000	TBD
Total	1,850	TBD	92,500	TBD

9. D&D Information

The one-for-one offset requirement will be met by utilizing site-banked square footage. A plan for D&D of the existing facility will be developed at the end of construction of the new facility when characterization data is available. D&D of the current facility is too far in the future for accurate cost estimates at this time.

	Square Feet
New area being constructed by this project at LANL……	2,000 – 4,000
Area of D&D in this project at LANL……	0
Area at LANL to be transferred, sold, and/or D&D outside the project including area previously "banked"……	2,000 – 4,000
Area of D&D in this project at other sites……..	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"……	0
Total area eliminated ……..	2,000 - 4,000

10. Acquisition Approach

The TLW design was and the construction will be obtained through competitively awarded contracts using a firm fixed price contracting.

06-D-141, Uranium Processing Facility (UPF)
Y-12 National Security Complex, Oak Ridge, Tennessee
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes
This PDS is an update from Fiscal Year (FY) 2015 and does not include a new start for the budget year.

Summary
The most recent DOE Order 413.3B approved Critical Decision (CD) is CD-1 that was approved on 06/08/2012 with a preliminary cost range of $4.2 billion to $6.5 billion and CD-4 of 4th quarter (Q) FY 2022.

Since the 2012 CD-1 approval the cost estimate for the project exceeded the high end of the cost range. The two primary contributors are: changes to the 2012 CD-1 funding profile based on annual affordability and increases in the commodities, such as steel and concrete, identified during the maturation of the design. As a consequence and consistent with the Department's build-to-budget strategy, the project team realigned scope to focus solely on the 9212 mission requirements, eliminating construction of space for future equipment installations. In 2014, the NNSA Administrator chartered an independent review team to validate the proposed approach could meet the mission need in 2025 for a budget not to exceed $6.5 billion. The results of the review team agreed with the basic plan and provided recommendations that, when fully implemented, should deliver critical Building 9212 capabilities for $6.5 billion by 2025. The team's recommendations included significant changes in how the project is viewed in light of a greater uranium mission strategy. The recommendations resulted in a different approach to the management decision authority and funding for the replacement of uranium capabilities. The preferred alternative includes multiple facilities with requirements tailored as appropriate for each type of facility.

FY 2016 funds will be used consistent with the review team recommendations and will include the design of the main processing and support facilities and processes and continue with subprojects supporting UPF infrastructure and site preparation activities. For FY 2017 and the outyears, the numbers presented are estimates and will be finalized once the project has an approved CD-2 performance baseline. Consistent with NNSA's increased emphasis on project management rigor, the Total Project Costs (TPCs) and baseline schedules for subprojects will not be approved until the designs are sufficiently mature to support a credible cost and schedule estimate.

The construction execution plan has been refined since FY 2015. With the planned completion of the Site Readiness Subproject in FY 2015, and the continuation of the Site Infrastructure and Services Subproject, preparations have begun to initiate the Site Preparation Subproject (06-D-141-02) which will include the large scale site excavation and mass fill that forms the foundation for multiple UPF facilities. Additional subprojects or long lead procurement authorizations may be identified as facility design and acquisition plans complete in FY 2016.

Site Readiness Subproject (06-D-141-01): Site Readiness received CD-2/3 approval in January 2013. The TPC for the subproject is $65,000 and CD-4 is 2Q FY 2015.

Site Preparation Subproject (06-D-141-02): The Site Preparation cost range is to be determined (TBD) with a projected CD-2/3 and CD-4 date TBD. Additional subprojects or long lead procurement authorizations may be identified to support the overall UPF execution strategy.

Nuclear Facilities, Process Equipment, and Balance of Facilities Subproject/s (06-D-141-04): The main processing capabilities will be subdivided into multiple subprojects and the preliminary cost range is to be determined (TBD) with a projected CD-2/3 and CD-4 date TBD. Prior to CD-2, NNSA will determine the feasibility of further subdividing this subproject to enable construction of facilities as the design for each facility matures.

Site Infrastructure and Services (SIS) Subproject (06-D-141-05): SIS CD-2/3 is planned for approval in FY 2015. The cost range for the subproject is $30,000 - $85,000 and the planned CD-4 is 4Q FY 2016.

FY 2016 activities include replacement and relocation of uranium capabilities, ongoing design activities for the nuclear facilities and associated support facilities, procurements, and construction of subprojects. Project activities include awarding multiple CD-2 and CD-3 packages for smaller, more manageable integrated subprojects to achieve commitments for cost and schedule. Capital project funding will be used for construction of these subprojects but will not be authorized until the subproject performance baselines have been validated and the CD-2 and 3 are approved in accordance with DOE O 413.3B.

A Level 4 PMCDP qualified Federal Project Director has been assigned to this project and has approved this CPDS.

This CPDS reflects the funding required to replace certain uranium capabilities and complete the desired alternative under $6.5 billion by 2025. As represented in the FY 2016 request, design, construction and Other Project Costs (OPC) will continue to be executed through the line item funding. After October 1, 2011, OPC work has and will only be performed using funding specifically appropriated by Congress for the project.

2. Critical Milestone History

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	12/17/2004		07/25/2007	TBD	2QFY2014	TBD	TBD	TBD
FY 2012	12/17/2004		07/25/2007	4QFY2013	2QFY2014	4QFY2013	TBD	TBD
FY 2013	12/17/2004		07/25/2007	4QFY2013	2QFY2014	4QFY2013	N/A	4QFY2022
FY 2014	12/17/2004		06/08/2012	3Q FY2014	4QFY2015	3QFY2015	N/A	TBD
FY 2015	12/17/2004		06/08/2012	TBD	TBD	TBD	N/A	TBD
FY 2016	12/17/2004	2/9/2006	06/08/2012	TBD	TBD	TBD	N/A	TBD

Site Readiness Subproject (06-D-141-01)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014 PB	12/17/2004		06/08/2012	1/29/2013	01/29/2013	01/29/2013	N/A	2QFY2015
FY 2015	12/17/2004		06/08/2012	1/29/2013	01/29/2013	01/29/2013	N/A	2QFY2015
FY 2016	12/17/2004	2/9/2006	06/08/2012	1/29/2013	01/29/2013	01/29/2013	N/A	2QFY2015

Site Preparation Subproject (06-D-141-02)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	12/17/2004		06/08/2012	2QFY2014	2QFY2014	2QFY2014	N/A	4QFY2016
FY 2016	12/17/2004	2/9/2006	06/08/2012	TBD	TBD	TBD	N/A	TBD

Nuclear Facilities, Process Equipment, and Balance of Facilities Subproject/s (06-D-141-04)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2014	12/17/2004		7/25/2007	3QFY2014	4QFY2015	3QFY2015	N/A	TBD
FY 2015	12/17/2004		7/25/2007	TBD	TBD	TBD	N/A	TBD
FY 2016	12/17/2004	2/9/2006	06/08/2012	TBD	TBD	TBD	N/A	TBD

Site Infrastructure and Services Subproject (06-D-141-05)[a]

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2015	12/17/2004		7/25/2007	4QFY2014	4QFY2013	4QFY2014	N/A	4QFY2016
FY 2016	12/17/2004	2/9/2006	06/08/2012	2QFY2015	3QFY2015	2QFY2015	N/A	4QFY2016

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History

Overall Project

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	351,149	935,000-1,604,000	1,124,000-1,928,000	276,000-472,000	TBD	TBD	1,400,000-3,500,000
FY 2012	528,690	3,174,779-5,320,310	3,703,000-5,849,000	497,000-651,000	N/A	497,000-651,000	4,200,000-6,500,000
FY 2013	566,192	3,136,808-5,150,808	3,703,000-5,717,000	497,000-783,000	N/A	497,000-783,000	4,200,000-6,500,000
FY 2014	1,164,000	TBD	TBD	TBD	N/A	TBD	TBD
FY 2015	TBD	TBD	TBD	TBD	N/A	TBD	TBD
FY 2016	TBD	TBD	TBD	TBD	N/A	TBD	TBD

Site Readiness Subproject (06-D-141-01)

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	N/A[a]	64,000	64,000	1,000	N/A	1,000	65,000
FY 2016	N/A[b]	64,000	64,000	1,000	N/A	1,000	65,000

Site Preparation Subproject (06-D-141-02)

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2016	N/A[a]	TBD	TBD	TBD	N/A	TBD	TBD

[a] The schedule are only estimates and consistent with the high end of the schedule range.
[b] Design costs are included under subproject 06-D-141-04.

Nuclear Facilities, Process Equipment, and Balance of Facilities Subproject/s (06-D-141-04)

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	TBD	TBD	TBD	TBD	N/A	TBD	TBD
FY 2016	TBD	TBD	TBD	TBD	N/A	TBD	TBD

Site Infrastructure and Services Subproject (06-D-141-05)[a]

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	N/A	58,000	58,000	1,500	N/A	1,500	59,500
FY 2016	N/A[a]	84,500	84,500	500	N/A	500	85,000

[a] The costs are only estimates and consistent with the high end of the cost range.

4. Project Scope and Justification

Scope

The UPF Project, which consists of a series of industrial and nuclear facilities and supporting infrastructure, is a major system acquisition that was selected in the Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement to ensure the long-term viability, safety, and security of the EU capability at the Y-12 National Security Complex. Within budget constraints, the UPF project focuses on modernizing uranium processing capabilities at Y-12 to reduce safety risk. The UPF project provides new facilities to replace the Building 9212 capabilities for Highly Enriched Uranium (HEU) casting, metal and special oxide production, recovery, decontamination and assay. Coordination between Headquarters, the Uranium Program Manager, the NNSA Production Office and the UPF Project Office is essential as a new uranium mission strategy and implementing plan are developed to define how the uranium capabilities are transitioned, relocated, sustained and/or replaced.

The goals and objectives of the UPF Project are to support the following modernization strategy:

- Ensure the long-term capability and improve the reliability of EU operations;
- Replace deteriorating, end-of-life facilities with modern manufacturing facilities;
- Significantly improve the health and safety posture for workers and the public by replacing administrative controls with engineered controls to manage the risks related to worker safety, criticality safety, fire protection, and environmental compliance;
- Accomplish essential upgrades to security at Y-12 necessary to carry out mission-critical activities and implement the Graded Security Protection Policy; and
- Allow the Y-12 site to accomplish a reduction in its high-security footprint.

The UPF project currently consists of the following subprojects:

Site Readiness Subproject (06-D-141-01) - The scope for Site Readiness is Bear Creek Road (BCR) relocation, including a bridge overpass of a haul road; installation of potable water lines paralleling the new road; electrical line demolition to make way for the road and clear the construction site; electrical line and communication cable installation; preparation of the West Borrow area to receive excess-soil and preparation and maintenance of a spoil area for wet soil; extension of an existing haul road for access to the construction site with excavation north of Portal 10; and jack-and-bore installation of utility casings.

Site Preparation Subproject (06-D-141-02) - The scope for Site Preparation includes completion of the balance of civil site preparation to ready the UPF site for facility construction. Scope includes the large scale site excavation and mass fill that forms the foundation for the UPF facilities' base mat and the balance of installation of infrastructure support for the follow-on processing and support facilities. Prior to CD-2, NNSA will determine the feasibility of further subdividing this subproject and may include selected long lead procurement authorizations.

Nuclear Facilities, Process Equipment, and Balance of Facilities Subproject/s (06-D-141-04) - The scope of this Subproject includes the balance of the project scope: the nuclear facilities, utility systems, and support facilities. Prior to CD-2, NNSA will determine the feasibility of further subdividing this subproject and may include selected long lead procurement authorizations.

Site Infrastructure and Services Subproject (06-D-141-05) - This subproject will provide infrastructure and infrastructure support facilities and equipment for UPF. Scope includes the installation of security features for the haul road extension, and required grading and installation of water management features, and infrastructure support scope for the follow-on processing and support facilities.

Justification

The UPF Project is needed to ensure the long-term viability, safety, and security of the Enriched Uranium (EU) capability in the United States. The UPF Project will support the Nation's nuclear weapons stockpile, down blending of EU in support of nonproliferation, and provide uranium as feedstock for fuel for naval reactors. Currently these capabilities reside in aged and "genuinely decrepit" facilities as noted by the Perry Commission.

There is substantial risk that the existing facilities will continue to deteriorate to the point of significant impact to Defense Programs, Defense Nuclear Nonproliferation, and Naval Reactors programs. The impacts could result in loss of the U.S. capability to maintain the nuclear weapons stockpile through life extension programs, shutdown of the U.S. Navy nuclear powered fleet due to lack of EU fuel feedstock materials, and impact to the Defense Nuclear Nonproliferation program's ability to reduce the enrichment level of foreign research reactors through supply of lower enrichment fuels manufactured at Y-12. The risk of inadvertent or accidental shutdown of the existing facilities is high and may occur prior to completion and startup of the UPF Project.

The project is being conducted in accordance with the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets. Consistent with DOE O 413.3B, Earned Value information for all subprojects with a TPC greater than or equal to $20 million and an approved CD-2 will be reported in the Project Assessment and Reporting System (PARS II). Any ongoing subprojects, to include the UPF design effort, will be reported in PARS II. Funds appropriated under this data sheet may be used for independent assessments and oversight of the planning and execution of this project.

5. Financial Schedule

Site Readiness Subproject (06-D-141-01)

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design	N/A	N/A	N/A
Construction			
FY 2013	N/A	N/A	5,242
FY 2014	N/A	N/A	22,656
FY 2015	N/A	N/A	36,102
Total, Construction	N/A	N/A	64,000
TEC			
FY 2013	N/A	N/A	5,242
FY 2014	N/A	N/A	22,656
FY 2015	N/A	N/A	36,102
Total, TEC	N/A	N/A	64,000
Other Project Cost (OPC)			
OPC except D&D			
FY 2015	N/A	N/A	1,000
Total, OPC except D&D	N/A	N/A	1,000
Total Project Cost (TPC)			
FY 2013	N/A	N/A	5,242
FY 2014	N/A	N/A	22,656
FY 2015	N/A	N/A	37,102
Total, TPC	N/A	N/A	65,000

Site Preparation Subproject (06-D-141-02)

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design	N/A	N/A	N/A
Construction			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
Total, Construction	N/A	N/A	TBD

(dollars in thousands)

	Appropriations	Obligations	Costs
TEC			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
Total, TEC	N/A	N/A	TBD
Other Project Cost (OPC)			
OPC except D&D			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
Total, OPC except D&D	N/A	N/A	TBD
D&D	N/A	N/A	N/A
Total, D&D	N/A	N/A	N/A
OPC			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
Total, OPC	N/A	N/A	TBD
Total Project Cost (TPC)			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
Total, TPC	N/A	N/A	TBD

Nuclear Facility, Process Equipment, and Balance of Facilities Subproject (06-D-141-04)

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design (06-D-140)			
FY 2006	N/A	N/A	0
FY 2007	N/A	N/A	677
FY 2008	N/A	N/A	33,950
FY 2009	N/A	N/A	79,184
FY 2010	N/A	N/A	80,959
FY 2011	N/A	N/A	109,855
FY 2012	N/A	N/A	170,700
FY 2013	N/A	N/A	192,389
FY 2014	N/A	N/A	190,029
FY 2015	N/A	N/A	TBD

(dollars in thousands)

	Appropriations	Obligations	Costs
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, Design	N/A	N/A	TBD
Construction			
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, Construction	N/A	N/A	TBD
TEC			
FY 2006	N/A	N/A	0
FY 2007	N/A	N/A	677
FY 2008	N/A	N/A	33,950
FY 2009	N/A	N/A	79,184
FY 2010	N/A	N/A	80,959
FY 2011	N/A	N/A	109,855
FY 2012	N/A	N/A	170,700
FY 2013	N/A	N/A	192,389
FY 2014	N/A	N/A	190,029
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, TEC	N/A	N/A	TBD
Other Project Cost (OPC)			
OPC except D&D			
FY 2005 (Ops of Facilities)	N/A	N/A	12,113
FY 2006	N/A	N/A	7,809
FY 2007	N/A	N/A	10,082
FY 2008	N/A	N/A	11,730
FY 2009	N/A	N/A	14,000
FY 2010	N/A	N/A	20,500
FY 2011	N/A	N/A	18,894
FY 2012	N/A	N/A	0
FY 2013	N/A	N/A	0
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	TBD

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, OPC except D&D	N/A	N/A	TBD
D&D			
FY 2009	N/A	N/A	N/A
Total, D&D	N/A	N/A	N/A
OPC			
FY 2005	N/A	N/A	12,113
FY 2006	N/A	N/A	7,809
FY 2007	N/A	N/A	10,082
FY 2008	N/A	N/A	11,730
FY 2009	N/A	N/A	14,000
FY 2010	N/A	N/A	20,500
FY 2011	N/A	N/A	18,894
FY 2012	N/A	N/A	0
FY 2013	N/A	N/A	0
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, OPC	N/A	N/A	TBD
Total Project Cost (TPC)			
FY 2005	N/A	N/A	12,113
FY 2006	N/A	N/A	7,809
FY 2007	N/A	N/A	10,759
FY 2008	N/A	N/A	45,680
FY 2009	N/A	N/A	93,184
FY 2010	N/A	N/A	101,459
FY 2011	N/A	N/A	128,749
FY 2012	N/A	N/A	170,700
FY 2013	N/A	N/A	192,389
FY 2014	N/A	N/A	190,029
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, TPC	N/A	N/A	TBD

Site Infrastructure and Services (SIS) Subproject (06-D-141-05):

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design	N/A	N/A	N/A
Construction			
FY 2015	N/A	N/A	29,500
FY 2016	N/A	N/A	55,000
Total, Construction	N/A	N/A	84,500
TEC			
FY 2015	N/A	N/A	29,500
FY 2016	N/A	N/A	55,000
Total, TEC	N/A	N/A	84,500
Other Project Cost (OPC)			
OPC except D&D			
FY 2016	N/A	N/A	500
Total, OPC except D&D	N/A	N/A	500
Total Project Cost (TPC)			
FY 2015	N/A	N/A	29,500
FY 2016	N/A	N/A	55,500
Total, TPC	N/A	N/A	85,000

Overall Project

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2006	5,000	5,000	0
FY 2007	5,000	5,000	677
FY 2008	38,583	38,583	33,950
FY 2009	90,622	90,622	79,184
FY 2010	N/A	N/A	80,959
FY 2011	N/A	N/A	109,855
FY 2012	N/A	N/A	170,700
FY 2013	N/A	N/A	192,389
FY 2014	N/A	N/A	190,029
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
Total, Design	TBD	TBD	TBD
Construction			
FY 2013	N/A	N/A	5,242
FY 2014	N/A	N/A	22,656
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
Total, Construction	N/A	N/A	TBD
TEC			
FY 2006	5,000	5,000	0
FY 2007	5,000	5,000	677
FY 2008	38,583	38,583	33,950
FY 2009	90,622	90,622	79,184
FY 2010	94,000	94,000	80,959
FY 2011	114,786	114,786	109,855
FY 2012	160,194	160,194	170,700
FY 2013	312,783	312,783	197,631
FY 2014	297,000	297,000	212,685
FY 2015	322,000	322,000	TBD
FY 2016	430,000	430,000	TBD
FY 2017	500,000	500,000	TBD
FY 2018	515,000	515,000	TBD
FY 2019	520,000	520,000	TBD
FY 2020	525,000	525,000	TBD
FY 2021	TBD	TBD	TBD
FY 2022	TBD	TBD	TBD
Total, TEC	TBD	TBD	TBD

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Other Project Cost (OPC)			
OPC except D&D			
FY 2005	12,113	12,113	12,113
FY 2006	7,809	7,809	7,809
FY 2007	10,082	10,082	10,082
FY 2008	11,730	11,730	11,730
FY 2009	14,000	14,000	14,000
FY 2010	20,500	14,000	20,500
FY 2011	18,894	20,500	18,894
FY 2012	N/A	N/A	0
FY 2013	N/A	N/A	0
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	TBD
FY 2016	N/A	N/A	TBD
FY 2017	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2018	N/A	N/A	TBD
FY 2019	N/A	N/A	TBD
FY 2020	N/A	N/A	TBD
Total, OPC except D&D	N/A	N/A	TBD
Total Project Cost (TPC)			
FY 2005	12,113	12,113	12,113
FY 2006	12,809	12,809	7,809
FY 2007	15,082	15,082	10,759
FY 2008	50,313	50,313	45,680
FY 2009	104,622	104,622	93,184
FY 2010	114,500	108,000	101,459
FY 2011	133,680	135,286	128,749
FY 2012	160,194	160,194	170,700
FY 2013	312,783	312,783	197,631
FY 2014	309,000	309,000	212,685
FY 2015	335,000	335,000	TBD
FY 2016	430,000	430,000	TBD
FY 2017	500,000	500,000	TBD
FY 2018	515,000	515,000	TBD
FY 2019	520,000	520,000	TBD
FY 2020	525,000	525,000	TBD
FY 2021	TBD	TBD	TBD
FY 2022	TBD	TBD	TBD
Total, TPC	6,500,000	6,500,000	6,500,000

6. Details of Project Cost Estimate

Site Readiness Subproject (06-D-141-01)

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	N/A	N/A	N/A
Contingency	N/A	N/A	N/A
Total, Design	N/A	N/A	N/A
Construction			
Site Preparation	50,200	50,200	50,202
Equipment	0	0	0
Other Construction	0	0	0
Contingency	13,800	13,800	14,622
Total, Construction	64,000	64,000	64,824
Total, TEC	64,000	64,000	64,824
Contingency, TEC	13,800	13,800	14,622
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	0
Conceptual Design	0	0	0
Start-up	1,000	1,000	176
Contingency	0	0	0
Total, OPC except D&D	1,000	1,000	176
D&D			
D&D	0	0	0
Contingency	0	0	0
Total, D&D	0	0	0
Total, OPC	1,000	1,000	176
Contingency, OPC	0	0	0
Total, TPC	65,000	65,000	65,000
Total, Contingency	13,800	13,800	14,622

Site Preparation Subproject (06-D-141-02)

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	TBD	N/A	N/A
Contingency	TBD	N/A	N/A
Total, Design	TBD	N/A	N/A
Construction			
Site Preparation	TBD	N/A	N/A
Equipment	TBD	N/A	N/A
Other Construction	TBD	N/A	N/A
Contingency	TBD	N/A	N/A
Total, Construction	TBD	N/A	N/A
Total, TEC	TBD	N/A	N/A
Contingency, TEC	TBD	N/A	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	TBD	N/A	N/A
Conceptual Design	TBD	N/A	N/A
Start-up	TBD	N/A	N/A
Contingency	TBD	N/A	N/A
Total, OPC except D&D	TBD	N/A	N/A
D&D			
D&D	N/A	N/A	N/A
Contingency	N/A	N/A	N/A
Total, D&D	N/A	N/A	N/A
Total, OPC	TBD	N/A	N/A
Contingency, OPC	TBD	N/A	N/A
Total, TPC	TBD	N/A	N/A
Total, Contingency	TBD	N/A	N/A

Nuclear Facility, Process Equipment, and Balance of Facilities Subproject (06-D-141-04)

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	TBD	TBD	N/A
Contingency	TBD	TBD	N/A
Total, Design	TBD	TBD	N/A
Construction			
Site Preparation	TBD	N/A	N/A
Equipment	TBD	N/A	N/A
Other Construction	TBD	N/A	N/A
Contingency	TBD	N/A	N/A
Total, Construction	TBD	N/A	N/A
Total, TEC	TBD	N/A	N/A
Contingency, TEC	TBD	N/A	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	TBD	N/A	N/A
Conceptual Design	TBD	N/A	N/A
Start-up	TBD	N/A	N/A
Contingency	TBD	N/A	N/A
Total, OPC except D&D	TBD	N/A	N/A
D&D			
D&D	N/A	N/A	N/A
Contingency	N/A	N/A	N/A
Total, D&D	N/A	N/A	N/A
Total, OPC	TBD	N/A	N/A
Contingency, OPC	TBD	N/A	N/A
Total, TPC	TBD	N/A	N/A
Total, Contingency	TBD	N/A	N/A

Site Infrastructure and Services (SIS) Subproject (06-D-141-05)

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	N/A	N/A	N/A
Contingency	N/A	N/A	N/A
Total, Design	N/A	N/A	N/A
Construction			
Site Preparation	25,000	40,000	N/A
Equipment	30,000	0	N/A
Other Construction	19,500	11,500	N/A
Contingency	10,000	6,500	N/A
Total, Construction	84,500	58,000	N/A
Total, TEC	84,500	58,000	N/A
Contingency, TEC	10,000	6,500	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	N/A
Conceptual Design	0	0	N/A
Start-up	500	1,500	N/A
Contingency	0	0	N/A
Total, OPC except D&D	500	1,500	N/A
Total, OPC	500	1,500	N/A
Contingency, OPC	0	0	N/A
Total, TPC	85,000	59,500	N/A
Total, Contingency	10,000	6,500	N/A

Overall Project

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	TBD	TBD	N/A
Contingency	TBD	TBD	N/A
Total, Design	TBD	TBD	N/A
Construction			
Site Preparation	TBD	TBD	N/A
Equipment	TBD	TBD	N/A
Other Construction	TBD	TBD	N/A
Contingency	TBD	TBD	N/A
Total, Construction	TBD	TBD	N/A
Total, TEC	TBD	TBD	N/A
Contingency, TEC	TBD	TBD	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	TBD	TBD	N/A
Conceptual Design	TBD	TBD	N/A
Start-up	TBD	TBD	N/A
Contingency	TBD	TBD	N/A
Total, OPC except D&D	TBD	TBD	N/A
D&D			
D&D	N/A	N/A	N/A
Contingency	N/A	N/A	N/A
Total, D&D	N/A	N/A	N/A
Total, OPC	TBD	TBD	N/A
Contingency, OPC	TBD	TBD	N/A
Total, TPC	TBD	TBD	N/A
Total, Contingency	TBD	TBD	N/A

Section 7 Schedule of Appropriation Requests

Overall Project (06-D-141)

		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Total
FY 2011	TEC	913,620	320,000	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	1,149,649	350,000	350,000	TBD	TBD	TBD	TBD	TBD
FY 2012	TEC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	TBD	350,000	350,000	TBD	TBD	TBD	TBD	TBD
FY 2013	TEC	1,245,185	493,000	493,000	258,000	TBD	TBD	TBD	TBD
	OPC	98,128	7,000	7,000	12,000	TBD	TBD	TBD	TBD
	TPC	1,343,313	500,000	500,000	270,000	TBD	TBD	TBD	6,500,000
FY 2014	TEC	1,162,020	486,171	573,604	587,300	616,952	TBD	TBD	TBD
	OPC	107,128	13,000	13,185	17,000	24,000	TBD	TBD	TBD
	TPC	1,269,148	499,171	586,789	604,300	640,952	TBD	TBD	TBD
FY 2015	TEC	1,117,968	322,000	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	107,128	13,000	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	1,225,096	335,000	430,000	500,000	515,000	520,000	TBD	TBD
FY 2016	TEC	1,117,968	322,000	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	107,128	13,000	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	1,225,096	335,000	430,000	500,000	515,000	520,000	525,000	TBD

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy	2025
Expected Useful Life (number of years)	50 Years
Expected Future Start of D&D of this capital asset	N/A

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	TBD	TBD	TBD	TBD
Utilities	TBD	TBD	TBD	TBD
Maintenance & Repair	TBD	TBD	TBD	TBD
Recapitalization	TBD	TBD	TBD	TBD
Total	TBD	TBD	TBD	TBD

9. D&D Information

The new area being constructed in this project is replacing existing facilities; however, the costs of D&D of the facilities that are being replaced are not included in the costs of this construction project. D&D of existing facilities will be the responsibility of the DOE Office of Environmental Management.

The construction of the UPF Project will add approximately 160,000 base-level square feet of new facilities to the Y-12 footprint and will allow eventual replacement of functions in Building 9212 including EU casting and EU chemical processing operations. The final D&D and demolition of these areas are not considered part of the UPF project.

10. Acquisition Approach

The NNSA Federal Project Director and the Integrated Project Team will be responsible for the execution of the project. The Management and Operating (M&O) partners for Y-12 are the designated design authority. The Office of Defense Programs (NA-10) and the Uranium Program Manager are responsible for defining program requirements, selecting the preferred alternatives, and for any project scope changes. The Office of Acquisition and Project Management (NA-APM) is responsible for providing support for alternative studies, and the lead NNSA office during design and construction of the project. The UPF Project will be executed through several acquisition strategies, to include firm fixed price, design bid build, design build and cost plus design build contracts.

The acquisition strategies for the Site Infrastructure and Services and Site Preparation subprojects will be performed as firm fixed price construction projects for the major civil construction scope. The Nuclear Facilities subproject is currently being assessed for best value acquisition strategies.

The Department will administer Architect-Engineer and Construction Contracts utilizing the M&O and stand-alone contract vehicles. Additionally, the United States Army Corps of Engineers (USACE) will have acquisition and project management responsibility for appropriate scopes of work as determined by the Department.

04-D-125, Chemistry and Metallurgy Research Building Replacement (CMRR) Project,
Los Alamos National Laboratory (LANL), Los Alamos, New Mexico
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update to the FY 2012 Reprogramming CPDS for CMRR and does not include a new start for the budget year. In the FY 2013 President's Budget Request, the construction of the CMRR Nuclear Facility (CMRR-NF) was deferred for at least five years and no data sheet was submitted in the past three budget requests.

The CMRR project was originally planned to meet its mission need in three phases. The first phase provided funding to construct the Radiological Laboratory/Utility/Office Building (RLUOB). The second phase provided funding for the RLUOB Equipment Installation (REI) effort which procured and installed the Special Facility Equipment (SFE) needed for the RLUOB. The third phase would have designed and constructed the Nuclear Facility (NF). Construction of the NF has been cancelled.

After CMRR-NF construction was deferred for at least five years, the NNSA developed a three-step plutonium infrastructure strategy. The first two steps in this strategy maintain continuity in analytical chemistry (AC) and materials characterization (MC) capabilities using existing facilities and will eliminate the need to construct the original CMRR-NF. This strategy was endorsed by the results of a directed business case analysis jointly conducted with the Department of Defense Office of Cost Assessment and Program Evaluation (CAPE). The first two steps in this strategy are now two subprojects under the CMRR line item described herein and will be executed using line item funding associated with this project.

This FY 2016 project data sheet describes two new subprojects which correlate to the first two steps of the new plutonium infrastructure strategy and are necessary to provide continuity in AC and MC capabilities and support the cessation of programmatic operations in the existing CMR facility by the end of calendar year 2019. These new subprojects are an alternative approach in lieu of constructing the CMRR Nuclear Facility. In addition, this data sheet updates the Total Project Cost (TPC) for the RLUOB to reflect settlement of claims associated with the project since the last data sheet submittal.

Summary

The most recent DOE Order 413.3B approved Critical Decision (CD) for the CMRR is a revised CD-1, Approve Alternative Selection and Cost Range, that was approved on August 21, 2014 with a cost range of $2.4 billion - $2.9 billion and CD-4 in FY 2024. Additional CD-3A requests for long lead procurement will also be pursued during 2015. The FY 2012 President's Budget Request reflected a cost range of $3.71 billion - $5.86 billion. CD-1 estimates for cost and schedule are provided in this data sheet for the newly proposed subprojects based on the Independent Cost Review (ICR) developed for the approved revised CD-1; these will continue to be refined during the CD process.

Critical Decision CD-3A, Approve Long Lead Procurement, was approved for the new REI Phase 2 subproject of CMRR, on December 18, 2014 following completion of an Independent Cost Estimate (ICE).

RLUOB Subproject (04-D-125-01): CD-4 approved on June 24, 2010.

RLUOB Equipment Installation (REI) Subproject (04-D-125-02): CD-4 approved on June 20, 2013.

Nuclear Facility (NF) Subproject (04-D-125-03): This subproject is cancelled.

REI Phase 2 (REI2) Subproject (04-D-125-04): Transfers part of AC and MC capabilities from CMR to RLUOB by designing, purchasing and installing additional equipment in RLUOB. The reconciled cost range for this subproject after the DOE Office of Acquisition and Project Management (DOE-APM) conducted an ICR is $505 million - $675 million and CD-4 is planned for first quarter (1Q) FY 2020. A CD-3A request for procurement of long lead equipment and site preparations, following a reconciled ICE conducted by DOE-APM, was approved for REI2 on December 18, 2014.

PF-4 Equipment Installation (PEI) Subproject (04-D-125-05): Transfers remaining AC and MC capabilities from CMR to PF-4. This subproject includes room and infrastructure modifications, removal of contaminated equipment from PF-4, and procurement of new equipment for installation. The reconciled cost range for this subproject after the DOE-APM CD-1 ICR is $995 million - $1,365 million and CD-4 is planned for second quarter (2Q) FY 2024.

Prior year project funds and FY 2015 funds will be used to complete a conceptual design activities, long lead equipment procurements, site investigation, and other required documentation. NNSA's Office of Defense Programs and NNSA's Office of Acquisition and Project Management will continue to partner with the appropriate organizations within and outside DOE during the process to achieve an approved Performance Baseline. Estimates will be finalized once the project has achieved 90 percent design maturity and baseline approval.

Some Other Project Costs (OPCs) will be funded from the prior year funding that was approved for reprogramming from this line item to RTBF Operations of Facilities ($17 million). We will utilize these available funds in accordance with direction provided by the appropriate committees. Additional OPCs are addressed in this budget request.

Of the preliminary cost range of $1,500 million - $2,050 million for the sum of the REI2 and PEI subprojects, $17 million of the $43.3M reprogrammed in FY 2013 and $35.7 million of the FY 2015 appropriations are included in this range.

A Federal Project Director at the appropriate level will be assigned to each sub-project. Project funds may be used by the Federal Project Directors for contracted support services for the federal project team.

2. Critical Milestone History

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2004	07/16/2002	N/A	1QFY2004		N/A	2QFY2004	N/A	1QFY2011
FY 2005	07/16/2002	N/A	3QFY2004		N/A	3QFY2005	N/A	3QFY2012
FY 2006	07/16/2002	N/A	2QFY2005	4QFY2005	N/A	1QFY2006	N/A	4QFY2010
FY 2007	07/16/2002	N/A	09/30/2005	1QFY2006	N/A	1QFY2006	N/A	1QFY2013
FY 2008	07/16/2002	N/A	09/30/2005	10/21/2005	N/A	1QFY2006	N/A	1QFY2013
FY 2009	07/16/2002	N/A	09/30/2005	TBD	N/A	TBD	N/A	TBD
FY 2010	07/16/2002	N/A	09/30/2005	TBD	N/A	TBD	N/A	TBD
FY 2011	07/16/2002	N/A	05/18/2005	TBD	N/A	TBD	N/A	TBD
FY 2012	07/16/2002	N/A	05/18/2005	4QFY2012	N/A	4QFY2012	N/A	TBD
FY 2012 Rep	07/16/2002	N/A	05/18/2005	TBD	TBD	TBD	N/A	TBD
FY 2016	07/16/2002	4QFY2015	4QFY2014	3QFY2016	2QFY2016	3QFY2016	4QFY2019	4QFY2024

RLUOB Subproject (04-D-125-01)

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	07/16/2002	N/A	05/18/2005	10/21/2005	N/A	10/21/2005	N/A	02/28/2010
FY 2012	07/16/2002	N/A	05/18/2005	10/21/2005	N/A	10/21/2005	N/A	06/24/2010
FY 2012 Rep	07/16/2002	N/A	05/18/2005	10/21/2005	N/A	10/21/2005	N/A	06/24/2010
FY 2016	07/16/2002	N/A	05/18/2005	10/21/2005	N/A	10/21/2005	N/A	06/24/2010

RLUOB Equipment Installation (REI) Subproject (04-D-125-02)

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	07/16/2002	N/A	05/18/2005	07/17/2009	N/A	07/17/2009	N/A	04/30/2013
FY 2012	07/16/2002	N/A	05/18/2005	07/17/2009	N/A	07/17/2009	N/A	04/30/2013
FY 2012 Rep	07/16/2002	N/A	05/18/2005	07/17/2009	N/A	07/17/2009	N/A	3QFY2013
FY 2016	07/16/2002	N/A	05/18/2005	07/17/2009	N/A	07/17/2009	N/A	06/20/2013

Nuclear Facility (NF) Subproject (04-D-125-03)

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2011	07/16/2002	N/A	05/18/2005	TBD	N/A	TBD	N/A	TBD
FY 2012	07/16/2002	N/A	05/18/2005	4QFY2012	N/A	4QFY2012	N/A	TBD
FY 2012 Rep	07/16/2002	N/A	05/18/2005	TBD	TBD	TBD	N/A	TBD
FY 2016	07/16/2002	N/A	05/18/2005	Cancelled	Cancelled	Cancelled	N/A	Cancelled

REI Phase 2 (REI2) Subproject (04-D-125-04)

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2016	07/16/2002	4QFY2015	8/21/2014	3QFY2016	2QFY2016	3QFY2016	N/A	1QFY2020

	CD-3A	*CD-3B*		
FY 2016	12/18/2014	2QFY2015		

PF-4 Equipment Installation (PEI) Subproject (04-D-125-05)

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2016	07/16/2002	4QFY2015	4QFY2014	3QFY2016	2QFY2016	3QFY2016	4QFY2019	1QFY2024

	CD-3A	*CD-3B*		
FY 2016	2QFY2015	1QFY2016		

CD-0 – Approve Mission Need
CD-1 – Approve Alternative Selection and Cost Range
CD-2 – Approve Performance Baseline
CD-3 – Approve Start of Construction
CD-4 – Approve Start of Operations or Project Closeout
D&D Start – Start of Demolition & Decontamination (D&D) work
D&D Complete – Completion of D&D work
CD-3A – Long Lead for equipment

3. Project Cost History

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2004	N/A	N/A	500,000	100,000	N/A	N/A	600,000
FY 2005	N/A	N/A	500,000	100,000	N/A	N/A	600,000
FY 2006	N/A	N/A	750,000	100,000	N/A	N/A	850,000
FY 2007	N/A	N/A	738,097	100,000	N/A	N/A	838,097
FY 2008	65,939	672,158	738,097	100,000	N/A	N/A	838,097
FY 2009	TBD	TBD	TBD	TBD	N/A	TBD	TBD
FY 2010	65,138	TBD	TBD	TBD	N/A	TBD	TBD
FY 2016	63,646	2,295,936	2,359,582	463,721	54,000	517,721	2,877,303

RLUOB Subproject (04-D-125-01)

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	N/A	159,130	159,130	4,870	N/A	4,870	164,000
FY 2012	N/A	159,130	159,130	4,870	N/A	4,870	164,000
FY 2012 Rep	N/A	159,130	159,130	4,870	N/A	4,870	164,000
FY 2016	N/A	194,130	194,130	4,870	N/A	4,870	199,000

RLUOB Equipment Installation (REI) Subproject (04-D-125-02)

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	N/A	152,900	152,900	46,500	N/A	46,500	199,400
FY 2012	N/A	152,900	152,900	46,500	N/A	46,500	199,400
FY 2012 Rep	N/A	152,900	152,900	46,500	N/A	46,500	199,400
FY 2016	N/A	151,963	151,963	44,797	N/A	44,797	196,760

Nuclear Facility (NF) Subproject (04-D-125-03)

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2011	65,138	TBD	TBD	TBD	N/A	TBD	TBD
FY 2012	65,138	3,239,862-5,169,862	3,305,000-5,235,000	405,000-625,000	N/A	405,000-625,000	3,710,000-5,860,000
FY 2012 Rep	65,138	TBD	TBD	TBD	N/A	TBD	TBD
FY 2016	63,646	391,324	454,970	40,274	N/A	40,274	495,244

REI Phase 2 (REI2) Subproject (04-D-125-04)

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2016	0	540,000	540,000	130,000	N/A	130,000	675,000

PF-4 Equipment Installation (PEI) Subproject (04-D-125-05)

(dollars in thousands)

	TEC, Design 03-D-103	TEC, Design/ Construction 04-D-125	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2016	0	1,071,000	1,071,000	240,000	54,000	294,000	1,365,000

4. Project Scope and Justification

Scope

The CMRR Project as originally proposed relocated and consolidated mission critical analytical chemistry (AC), material characterization (MC), actinide research and development (R&D) capabilities, provided special nuclear material (SNM) storage and large vessel handling capabilities. This data sheet provides information related to two newly proposed subprojects to transition AC and MC capabilities into RLUOB and PF-4 to ensure continuity in plutonium support capabilities and enable the cessation of program operations in CMR by the end of calendar year 2019.

The complete list of CMRR line Item Project Sub-projects since inception is:

- **RLUOB Subproject (04-D-125-01):** Construction of a 203,686, gross square foot (gsf) facility to house laboratory space capable of handling radiological quantities of SNM; a 22,071 gsf utility building sized to provide utility services (including chilled and hot water, potable hot/cold water, compressed air, and process gases) for all CMRR facility elements; office space for CMRR workers located outside of perimeter security protection systems; and space for centralized TA-55 training activities. The RLUOB became fully functional and operational after the completion of the equipment installation effort for this facility in the REI phase.

- **RLUOB Equipment Installation (REI) Subproject (04-D-125-02):** Equipment installation included gloveboxes, hoods, AC/MC instrumentation, security and communication hardware, and final facility tie-ins and operational readiness/turnover activities. RLUOB equipment fabrication, installation, testing, and acceptance physically completed in FY 2012. Staff occupation of the office spaces has occurred and CD-4 has been approved. The facility exceeded its sustainability goal of LEED Silver by achieving LEED Gold in June 2012.

- **Nuclear Facility (NF) Subproject (04-D-125-03):** This subproject is hereby cancelled with the remaining mission need for CMRR to be met by REI2 and PEI.

- **REI Phase 2 (REI2) Subproject (04-D-125-04):** Maximizes the use of RLUOB laboratories by both reconfiguring some existing laboratory space and equipping empty laboratories with AC and MC capabilities. The RLUOB will operate at the increased radiological limit, 38.6 g of Pu-239 equivalent, which enables additional AC and MC operations to move in. New gloveboxes/hoods and equipment will be installed in RLUOB through this subproject. This project makes progress toward ceasing program operations in CMR in 2019. Specific capabilities in REI2 scope include, but are not limited to:
  - Trace Elements Sample Preparation
  - Mass Spectrometry Sample Preparation
  - X-Ray Fluorescence Sample Preparation and Instruments
  - Radiochemistry Counting Laboratory and Sample Preparation
  - Oxide and Metal Sample Distribution
  - Coulometry
  - AC and MC Capabilities for R&D and Troubleshooting

- **PF-4 Equipment Installation (PEI) Subproject (04-D-125-05):** The PEI subproject involves the following: relocation of existing PF-4 processes to create open consolidated space, reusing existing gloveboxes for new processes, decontamination and decommissioning (D&D) of old gloveboxes/equipment in PF-4 to create open laboratory space; and, installation of new gloveboxes/equipment in the created open space. PEI will support the AC and MC capabilities that require the processing of larger amounts of nuclear material. These capabilities support pit production, pit surveillance, plutonium science and other national security programs. The removal work will be executed as site-prep work within this subproject. Specific capabilities in PEI scope include, but are not limited to:
  - Sample Preparation Surface Science
  - Mechanical Testing
  - Physical Properties
  - Small Sample Fabrication and Preparation

Justification

As defined in the most recent revision of the Mission Need Statement (MNS), the mission of the Chemistry and Metallurgy Research Replacement Project is to ensure continuity in enduring analytical chemistry and materials characterization capabilities for NNSA actinide-based missions in support of stockpile stewardship. The AC and MC capabilities provided by this project support pit production, pit surveillance, plutonium science and other national security programs. During development of the plutonium strategy, the joint DOD-CAPE business case analysis (BCA) indicated that optimizing RLUOB (REI2) and repurposing space in PF-4 (PEI) should be started as soon as possible to maintain continuity in AC and MC capabilities.

The project is being conducted in accordance with the project management requirements in DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets.

Funds appropriated for this project may be used to provide independent assessments and other direct contractual support determined necessary by the FPD for the planning and execution of this project.

5. Financial Schedule

04-D-125-01-03, Prior Subproject (RLUOB/REI/Nuclear Facility)

(dollars in thousands)

	Appropriations	Obligations	Cost
Design (03-D-103-010)			
FY 2005	NA	NA	1,848
FY 2006	NA	NA	19,147
FY 2007	NA	NA	27,213
FY 2008	NA	NA	15,079
FY 2009	NA	NA	-329
FY 2010	NA	NA	44
FY 2011	NA	NA	0
FY 2012	NA	NA	339
FY 2013	NA	NA	188
FY 2014	NA	NA	44
FY 2015	NA	NA	73
Total, Design (03-D-103-010)	NA	NA	63,646
Design (04-D-125)			
FY 2007	NA	NA	3,109
FY 2008	NA	NA	24,713
FY 2009	NA	NA	47,102
FY 2010	NA	NA	62,252
FY 2011	NA	NA	101,924
FY 2012	NA	NA	132,593
FY 2013	NA	NA	15,158
FY 2014	NA	NA	724
Total Design (04-D-125)	NA	NA	387,575
Construction (04-D-125)			
FY 2006	NA	NA	15,933
FY 2007	NA	NA	29,214
FY 2008	NA	NA	50,236
FY 2009	NA	NA	62,288
FY 2010	NA	NA	40,515
FY 2011	NA	NA	82,942
FY 2012	NA	NA	16,306
FY 2013	NA	NA	-5
FY 2014	NA	NA	-68
Total, Construction (04-D-125)	NA	NA	297,361

	Appropriations	Obligations	Cost
TEC (04-D-125)			
FY 2006	NA	NA	15,933
FY 2007	NA	NA	32,323
FY 2008	NA	NA	74,949
FY 2009	NA	NA	109,390
FY 2010	NA	NA	102,767
FY 2011	NA	NA	184,866
FY 2012	NA	NA	148,899
FY 2013	NA	NA	15,153
FY 2014	NA	NA	656
Total, TEC (04-D-125)	NA	NA	684,936
TEC			
FY 2005	NA	NA	1,848
FY 2006	NA	NA	35,080
FY 2007	NA	NA	59,536
FY 2008	NA	NA	90,028
FY 2009	NA	NA	109,061
FY 2010	NA	NA	102,811
FY 2011	NA	NA	184,866
FY 2012	NA	NA	149,238
FY 2013	NA	NA	15,341
FY 2014	NA	NA	700
FY 2015	NA	NA	73
Total, TEC	NA	NA	748,582
Other Project Cost (OPC)			
OPC except D&D			
FY 2002	NA	NA	1,665
FY 2003	NA	NA	10,853
FY 2004	NA	NA	7,702
FY 2005	NA	NA	4,934
FY 2006	NA	NA	4,265
FY 2007	NA	NA	1,196
FY 2008	NA	NA	2,335
FY 2009	NA	NA	9,075
FY 2010	NA	NA	14,666
FY 2011	NA	NA	19,240
FY 2012	NA	NA	9,142
FY 2013	NA	NA	3,665
FY 2014	NA	NA	-17
Total, OPC except D&D	NA	NA	88,721
Other Project Cost (OPC) D&D			
OPC D&D			
FY 2020	NA	NA	NA
FY 2021	NA	NA	NA
Total, OPC D&D	NA	NA	NA

(dollars in thousands)

	Appropriations	Obligations	Cost
OPC Total			
OPC Total			
FY 2002	NA	NA	1,665
FY 2003	NA	NA	10,853
FY 2004	NA	NA	7,702
FY 2005	NA	NA	4,934
FY 2006	NA	NA	4,265
FY 2007	NA	NA	1,196
FY 2008	NA	NA	2,335
FY 2009	NA	NA	9,075
FY 2010	NA	NA	14,666
FY 2011	NA	NA	19,240
FY 2012	NA	NA	9,142
FY 2013	NA	NA	3,665
FY 2014	NA	NA	-17
Total, OPC Total	NA	NA	88,721
Total Project Cost (TPC)			
FY 2002	NA	NA	1,665
FY 2003	NA	NA	10,853
FY 2004	NA	NA	7,702
FY 2005	NA	NA	6,782
FY 2006	NA	NA	39,345
FY 2007	NA	NA	60,732
FY 2008	NA	NA	92,363
FY 2009	NA	NA	118,136
FY 2010	NA	NA	117,477
FY 2011	NA	NA	204,106
FY 2012	NA	NA	158,380
FY 2013	NA	NA	19,006
FY 2014	NA	NA	683
FY 2015	NA	NA	73
Total, TPC	NA	NA	837,303

04-D-125-04, RLUOB Equipment Installation Phase 2

	(dollars in thousands)		
	Appropriations	**Obligations**	**Cost**
Design (04-D-125)			
FY 2015	NA	NA	46,000
FY 2016	NA	NA	50,000
Total Design (04-D-125)	NA	NA	96,000
Construction (04-D-125)			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	12,000
FY 2016	NA	NA	50,000
FY 2017	NA	NA	135,000
FY 2018	NA	NA	123,000
FY 2019	NA	NA	104,000
FY 2020	NA	NA	19,000
Total, Construction (04-D-125)	NA	NA	444,000
TEC (04-D-125)			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	58,000
FY 2016	NA	NA	100,000
FY 2017	NA	NA	135,000
FY 2018	NA	NA	123,000
FY 2019	NA	NA	104,000
FY 2020	NA	NA	19,000
Total, TEC (04-D-125)	NA	NA	540,000
TEC			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	58,000
FY 2016	NA	NA	100,000
FY 2017	NA	NA	135,000
FY 2018	NA	NA	123,000
FY 2019	NA	NA	104,000
FY 2020	NA	NA	19,000
Total, TEC	NA	NA	540,000
Other Project Cost (OPC)			
OPC except D&D			
FY 2014	NA	NA	4,408
FY 2015	NA	NA	19,592
FY 2016	NA	NA	12,000
FY 2017	NA	NA	10,000
FY 2018	NA	NA	12,000
FY 2019	NA	NA	40,000
FY 2020	NA	NA	37,000
Total, OPC except D&D	NA	NA	135,000

(dollars in thousands)

	Appropriations	Obligations	Cost
Other Project Cost (OPC) D&D			
OPC D&D			
FY 2020	NA	NA	NA
FY 2021	NA	NA	NA
Total, OPC D&D	NA	NA	NA
OPC Total			
OPC Total			
FY 2014	NA	NA	4,408
FY 2015	NA	NA	19,592
FY 2016	NA	NA	12,000
FY 2017	NA	NA	10,000
FY 2018	NA	NA	12,000
FY 2019	NA	NA	40,000
Total, OPC Total	NA	NA	98,000
Total Project Cost (TPC)			
FY 2014	NA	NA	5,408
FY 2015	NA	NA	77,592
FY 2016	NA	NA	112,000
FY 2017	NA	NA	145,000
FY 2018	NA	NA	135,000
FY 2019	NA	NA	144,000
FY 2020	NA	NA	19,000
Total, TPC	NA	NA	638,000

04-D-125-05, PF-4 Equipment Installation

	(dollars in thousands)		
	Appropriations	**Obligations**	**Cost**
Design (04-D-125)			
FY 2015	NA	NA	15,000
FY 2016	NA	NA	18,000
FY 2017	NA	NA	10,000
FY 2018	NA	NA	25,000
FY 2019	NA	NA	57,000
Total Design (04-D-125)	NA	NA	125,000
Construction (04-D-125)			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	12,000
FY 2016	NA	NA	28,000
FY 2017	NA	NA	22,000
FY 2018	NA	NA	13,000
FY 2019	NA	NA	5,000
FY 2020	NA	NA	144,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, Construction (04-D-125)	NA	NA	946,000
TEC (04-D-125)			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	27,000
FY 2016	NA	NA	46,000
FY 2017	NA	NA	32,000
FY 2018	NA	NA	38,000
FY 2019	NA	NA	62,000
FY 2020	NA	NA	144,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, TEC (04-D-125)	NA	NA	1,071,000
TEC			
FY 2014	NA	NA	1,000
FY 2015	NA	NA	27,000
FY 2016	NA	NA	46,000
FY 2017	NA	NA	32,000
FY 2018	NA	NA	38,000
FY 2019	NA	NA	62,000
FY 2020	NA	NA	144,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, TEC	NA	NA	1,071,000

(dollars in thousands)

	Appropriations	Obligations	Cost
Other Project Cost (OPC)			
OPC except D&D			
FY 2014	NA	NA	3,896
FY 2015	NA	NA	5,104
FY 2016	NA	NA	1,000
FY 2017	NA	NA	5,000
FY 2018	NA	NA	8,000
FY 2019	NA	NA	10,000
FY 2020	NA	NA	10,000
FY 2021	NA	NA	55,000
FY 2022	NA	NA	41,000
FY 2023	NA	NA	40,000
FY 2024	NA	NA	61,000
Total, OPC except D&D	NA	NA	240,000
Other Project Cost (OPC) D&D			
OPC D&D			
FY 2020	NA	NA	30,000
FY 2021	NA	NA	24,000
Total, OPC D&D	NA	NA	54,000
OPC Total			
OPC Total			
FY 2014	NA	NA	3,896
FY 2015	NA	NA	5,104
FY 2016	NA	NA	1,000
FY 2017	NA	NA	5,000
FY 2018	NA	NA	8,000
FY 2019	NA	NA	10,000
FY 2020	NA	NA	40,000
FY 2021	NA	NA	79,000
FY 2022	NA	NA	41,000
FY 2023	NA	NA	40,000
FY 2024	NA	NA	61,000
Total, OPC Total	NA	NA	294,000
Total Project Cost (TPC)			
FY 2014	NA	NA	4,896
FY 2015	NA	NA	32,104
FY 2016	NA	NA	47,000
FY 2017	NA	NA	37,000
FY 2018	NA	NA	46,000
FY 2019	NA	NA	72,000
FY 2020	NA	NA	184,000
FY 2021	NA	NA	289,000
FY 2022	NA	NA	294,000
FY 2023	NA	NA	284,000
FY 2024	NA	NA	75,000
Total, TPC	NA	NA	1,365,000

Total Project

(dollars in thousands)

	Appropriations	Obligations	Cost
Design (03-D-103-010)			
FY 2004	9,500	0	0
FY 2005	13,567	23,067	1,848
FY 2006	27,910	27,910	19,147
FY 2007	12,669	14,161	27,213
FY 2008	0	0	15,079
FY 2009	0	0	-329
FY 2010	0	0	44
FY 2011	0	0	0
FY 2012	0	-1,492	339
FY 2013			188
FY 2014			44
FY 2015			73
Total, Design (03-D-103-010)	63,646	63,646	63,646
Design (04-D-125)			
FY 2007	NA	NA	3,109
FY 2008	NA	NA	24,713
FY 2009	NA	NA	47,102
FY 2010	NA	NA	62,252
FY 2011	NA	NA	101,924
FY 2012	NA	NA	132,593
FY 2013	NA	NA	15,158
FY 2014	NA	NA	724
FY 2015	NA	NA	61,000
FY 2016	NA	NA	68,000
FY 2017	NA	NA	10,000
FY 2018	NA	NA	25,000
FY 2019	NA	NA	57,000
Total Design (04-D-125)	NA	NA	608,575
Construction (04-D-125)			
FY 2006	NA	NA	15,933
FY 2007	NA	NA	29,214
FY 2008	NA	NA	50,236
FY 2009	NA	NA	62,288
FY 2010	NA	NA	40,515
FY 2011	NA	NA	82,942
FY 2012	NA	NA	16,306
FY 2013	NA	NA	-5
FY 2014	NA	NA	1,932
FY 2015	NA	NA	24,000
FY 2016	NA	NA	78,000

	(dollars in thousands)		
	Appropriations	**Obligations**	**Cost**
FY 2017	NA	NA	157,000
FY 2018	NA	NA	136,000
FY 2019	NA	NA	109,000
FY 2020	NA	NA	163,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, Construction (04-D-125)	NA	NA	1,687,361
TEC (04-D-125)			
FY 2004	9,941	0	0
FY 2005	39,684	49,625	0
FY 2006	54,450	54,450	15,933
FY 2007	53,422	53,422	32,323
FY 2008	74,141	74,141	74,949
FY 2009	97,194	97,194	109,390
FY 2010	97,000	97,000	102,767
FY 2011 [a]	205,699	214,550	184,866
FY 2012	NA	-8,851	148,899
FY 2013	NA	NA	15,153
FY 2014	NA	NA	2,656
FY 2015	NA	NA	85,000
FY 2016	NA	NA	146,000
FY 2017	NA	NA	167,000
FY 2018	NA	NA	161,000
FY 2019	NA	NA	166,000
FY 2020	NA	NA	163,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, TEC (04-D-125)	NA	NA	2,295,936

[a] FY 2011 Appropriation was 214,550 and was reduced by 8,851 for a Prior Year Balance Rescission in FY 2014.

(dollars in thousands)

	Appropriations	Obligations	Cost
TEC			
FY 2004	19,441	0	0
FY 2005	53,251	72,692	1,848
FY 2006	82,360	82,360	35,080
FY 2007	66,091	67,583	59,536
FY 2008	74,141	74,141	90,028
FY 2009	97,194	97,194	109,061
FY 2010	97,000	97,000	102,811
FY 2011	205,699	214,550	184,866
FY 2012	NA	-10,343	149,238
FY 2013	NA	NA	15,341
FY 2014	NA	NA	2,700
FY 2015	NA	NA	85,073
FY 2016	NA	NA	146,000
FY 2017	NA	NA	167,000
FY 2018	NA	NA	161,000
FY 2019	NA	NA	166,000
FY 2020	NA	NA	163,000
FY 2021	NA	NA	210,000
FY 2022	NA	NA	253,000
FY 2023	NA	NA	244,000
FY 2024	NA	NA	14,000
Total, TEC	NA	NA	2,359,582
Other Project Cost (OPC)			
OPC except D&D			
FY 2002	NA	NA	1,665
FY 2003	NA	NA	10,853
FY 2004	NA	NA	7,702
FY 2005	NA	NA	4,934
FY 2006	NA	NA	4,265
FY 2007	NA	NA	1,196
FY 2008	NA	NA	2,335
FY 2009	NA	NA	9,075
FY 2010	NA	NA	14,666
FY 2011	NA	NA	19,240
FY 2012	NA	NA	9,142
FY 2013	NA	NA	3,665
FY 2014	NA	NA	8,287
FY 2015	NA	NA	24,696
FY 2016	NA	NA	13,000
FY 2017	NA	NA	15,000

(dollars in thousands)

	Appropriations	Obligations	Cost
FY 2018	NA	NA	20,000
FY 2019	NA	NA	50,000
FY 2020	NA	NA	47,000
FY 2021	NA	NA	55,000
FY 2022	NA	NA	41,000
FY 2023	NA	NA	40,000
FY 2024	NA	NA	61,000
Total, OPC except D&D	NA	NA	463,721
Other Project Cost (OPC) D&D			
OPC D&D			
FY 2020	NA	NA	30,000
FY 2021	NA	NA	24,000
Total, OPC D&D	NA	NA	54,000
OPC Total			
OPC Total			
FY 2002	1,665	1,665	1,665
FY 2003	12,177	12,177	10,853
FY 2004	7,214	7,214	7,702
FY 2005	7,164	7,164	4,934
FY 2006	1,209	1,209	4,265
FY 2007	4,187	4,187	1,196
FY 2008	0	0	2,335
FY 2009	9,000	9,000	9,075
FY 2010	14,403	14,403	14,666
FY 2011	30,668	30,668	19,240
FY 2012	17,000	0	9,142
FY 2013	0	0	3,665
FY 2014	NA	17,000	8,287
FY 2015	NA	NA	24,696
FY 2016	NA	NA	13,000
FY 2017	NA	NA	15,000
FY 2018	NA	NA	20,000
FY 2019	NA	NA	50,000
FY 2020	NA	NA	77,000
FY 2021	NA	NA	79,000
FY 2022	NA	NA	41,000
FY 2023	NA	NA	40,000
FY 2024	NA	NA	61,000
Total, OPC Total	NA	NA	517,721

(dollars in thousands)

	Appropriations	Obligations	Cost
Total Project Cost (TPC)			
FY 2002	1,665	1,665	1,665
FY 2003	12,177	12,177	10,853
FY 2004	26,655	7,214	7,702
FY 2005	60,415	79,856	6,782
FY 2006	83,569	83,569	39,345
FY 2007	70,278	71,770	60,732
FY 2008	74,141	74,141	92,363
FY 2009	106,194	106,194	118,136
FY 2010	111,403	111,403	117,477
FY 2011	236,367	245,218	204,106
FY 2012 [ab]	164,919	67,876	158,380
FY 2013	0	-7,000	19,006
FY 2014	0	93,212	10,987
FY 2015	35,700	36,188	109,769
FY 2016	155,610	155,610	159,000
FY 2017	159,615	159,615	182,000
FY 2018	180,900	180,900	181,000
FY 2019	216,095	216,095	216,000
FY 2020	239,600	239,600	240,000
FY 2021	289,000	289,000	289,000
FY 2022	294,000	294,000	294,000
FY 2023	284,000	284,000	284,000
FY 2024	75,000	75,000	75,000
Total, TPC	2,877,303	2,877,303	2,877,303

[a] Includes $17,000 for OPCs from the $43,300 reprogrammed from 04-D-125 to RTBF Ops of Facilities.
[b] Original appropriation was $200,000. This was reduced by $43,300 associated with the Plutonium Strategy reprogramming and further reduced $7,000 associated with the FY 2014 prior year balance rescission.

6. Details of Project Cost Estimate

04-D-125-01, RLUOB

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	0	0	0
Contingency	0	0	0
Total, Design	0	0	0
Construction			
Site Work	0	0	0
Long-lead Equipment	0	0	0
Construction	0	0	0
Contingency	0	0	0
Total, Construction	194,130	0	0
Total, TEC	194,130	0	0
Contingency, TEC	0	0	0
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	0
Conceptual Design	0	0	0
Contingency	0	0	0
Total, OPC except D&D	4,870	0	0
D&D			
D&D	0	0	0
Contingency	0	0	0
Total, D&D	0	0	0
Total, OPC	4,870	0	0
Contingency, OPC	0	0	0
Total, TPC	199,000	0	0
Total, Contingency	0	0	0

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	0	0	0
Contingency	0	0	0
Total, Design	13,498	0	0
Construction			
Site Work	0	0	0
Long-lead Equipment	0	0	0
Construction	0	0	0
Contingency	0	0	0
Total, Construction	138,465	0	0
Total, TEC	151,963	0	0
Contingency, TEC	0	0	0
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	0	0	0
Conceptual Design	0	0	0
Contingency	0	0	0
Total, OPC except D&D	0	0	0
D&D			
D&D	0	0	0
Contingency	0	0	0
Total, D&D	0	0	0
Total, OPC	44,797	0	0
Contingency, OPC	0	0	0
Total, TPC	196,760	0	0
Total, Contingency	0	0	0

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	N/A	TBD	N/A
Contingency	N/A	TBD	N/A
Total, Design	N/A	TBD	N/A
Construction			
Site Work	N/A	TBD	N/A
Long-lead Equipment	N/A	TBD	N/A
Construction	N/A	TBD	N/A
Contingency	N/A	TBD	N/A
Total, Construction	N/A	TBD	N/A
Total, TEC	N/A	TBD	N/A
Contingency, TEC	N/A	TBD	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	N/A	TBD	N/A
Conceptual Design	N/A	TBD	N/A
Contingency	N/A	TBD	N/A
Total, OPC except D&D	N/A	TBD	N/A
D&D			
D&D	N/A	TBD	N/A
Contingency	N/A	TBD	N/A
Total, D&D	N/A	TBD	N/A
Total, OPC	N/A	TBD	N/A
Contingency, OPC	N/A	TBD	N/A
Total, TPC	N/A	3,710,000-5,860,000	N/A
Total, Contingency	N/A	TBD	N/A

04-D-125-04, RLUOB Equipment Installation Phase 2

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design		N/A	N/A
Contingency		N/A	N/A
Total, Design	96,000	N/A	N/A
Construction			
Site Work		N/A	N/A
Long-lead Equipment		N/A	N/A
Construction		N/A	N/A
Contingency		N/A	N/A
Total, Construction	444,000	N/A	N/A
Total, TEC	540,000	N/A	N/A
Contingency, TEC		N/A	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning		N/A	N/A
Conceptual Design		N/A	N/A
Contingency		N/A	N/A
Total, OPC except D&D	135,000	N/A	N/A
D&D			
D&D	0	N/A	N/A
Contingency	0	N/A	N/A
Total, D&D	0	N/A	N/A
Total, OPC	135,000	N/A	N/A
Contingency, OPC		N/A	N/A
Total, TPC	675,000	N/A	N/A
Total, Contingency		N/A	N/A

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design		N/A	N/A
Contingency		N/A	N/A
Total, Design	125,000	N/A	N/A
Construction			
Site Work		N/A	N/A
Long-lead Equipment		N/A	N/A
Construction		N/A	N/A
Contingency		N/A	N/A
Total, Construction	946,000	N/A	N/A
Total, TEC	1,071,000	N/A	N/A
Contingency, TEC		N/A	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning		N/A	N/A
Conceptual Design		N/A	N/A
Contingency		N/A	N/A
Total, OPC except D&D	240,000	N/A	N/A
D&D			
D&D		N/A	N/A
Contingency		N/A	N/A
Total, D&D	54,000	N/A	N/A
Total, OPC	294,000	N/A	N/A
Contingency, OPC		N/A	N/A
Total, TPC	1,365,000	N/A	N/A
Total, Contingency		N/A	N/A

Total Project

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design		TBD	N/A
Contingency		TBD	N/A
Total, Design	672,221	TBD	N/A
Construction			
Site Work		TBD	N/A
Long-lead Equipment		TBD	N/A
Construction		TBD	N/A
Contingency		TBD	N/A
Total, Construction	1,687,361	TBD	N/A
Total, TEC	2,359,582	TBD	N/A
Contingency, TEC		TBD	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning		TBD	N/A
Conceptual Design		TBD	N/A
Contingency		TBD	N/A
Total, OPC except D&D	463,721	TBD	N/A
D&D			
D&D		N/A	N/A
Contingency		N/A	N/A
Total, D&D	54,000	N/A	N/A
Total, OPC	517,721	TBD	N/A
Contingency, OPC		TBD	N/A
Total, TPC	2,877,303	3,710,000 – 5,860,000	N/A
Total, Contingency		N/A	N/A

7. Schedule of Appropriation Requests

(dollars in thousands)

Request		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Outyears	Total
FY 2009	TEC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FY 2010	TEC	670,331	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	86,814	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	757,145	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FY 2011	TEC	1,556,330	300,000	0	0	0	0	0	1,532,769	3,389,099
	OPC	100,851	4,550	0	0	0	0	0	300,500	405,901
	TPC	1,657,181	304,550	0	0	0	0	0	1,833,269	3,795,000
FY 2012	TEC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FY 2016	TEC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	OPC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	TPC	947,783	35,700	155,610	159,615	180,900	216,095	239,600	942,000	2,877,303

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	4QFY 2020
Expected Useful Life (number of years)	50
Expected Future Start of D&D of this capital asset (fiscal quarter)	4QFY 2070

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	0	30,473	0	1,523,625
Utilities	0	33,583	0	1,679,126
Maintenance & Repair	0	60,945	0	3,397,250[a]
Total	0	125,000	0	6,600,001

9. D&D Information

For RLUOB and REI, the new area being constructed by these subprojects replaces existing facilities; however, the costs of D&D of the facilities that are being replaced are not included in the costs of this construction project.

For REI2 and PEI, there is no new area being constructed in these subprojects.

As directed by the DOE Acquisition Executive at CMRR CD-0, NNSA and LANL developed a pre-conceptual cost and schedule range for the D&D requirements of the existing CMR Building located at TA-3 during the CMRR conceptual design. The initial pre-conceptual cost estimate range for D&D of the CMR Building is approximately $200 million - $350 million (un-escalated FY 2004 dollars) with an associated schedule estimate range of 4-5 years. This information was presented as part

[a] Includes 350,000 listed under “Recapitalization” in the FY 2012 Reprogramming data sheet.

of CMRR CD-1 per Secretarial direction issued at CD-0. The deferral of CMRR-NF construction will not impact decisions to cease operations in CMR; NNSA is committed to ceasing programmatic operations in CMR by December 2019.

During the 3rd Quarter of FY 2005, the D&D of the existing CMR facility received CD-0 as a separate project in conjunction with CMRR CD-1 approval. Current Future Years Nuclear Security Program (FYNSP) funding profiles do not include the funding for the D&D of the CMR Facility. CMR Facility D&D is not part of the CMRR project scope. Some removal of contaminated equipment in PF-4 will occur using project funds; these totals are reflected in the D&D totals.

The CMR D&D commitment is reflected in this PDS for completeness. However, as planning for this D&D activity matures, NNSA may elect to enable this effort as a separate project or execute it as an element of a wider project or program for a portfolio of nuclear security enterprise disposition activities.

Square footage associated with construction of the RLUOB and the Central Utility Building will be offset by LANL "banked excess" D&D space to meet the "one-for-one" requirement within the FY 2002 Energy and Water and Water Development Appropriations Bill conference report (107-258). Given planned new construction (including RLUOB) at LANL and planned excess facility reductions, LANL is projecting it will have banked adequate square footage before CMR is demolished.

	Square Feet
New area being constructed by this project at Los Alamos National Laboratory……..	225,757
Area of D&D in this project at Los Alamos National Laboratory ……	0
Area at Los Alamos National Laboratory to be transferred, sold, and/or D&D outside the project including area previously "banked"……	225,757
Area of D&D in this project at other sites ……..……	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"……..……	0
Total area eliminated …….....	0

Site location, building name or numbers, and square footages of existing facilities to be replaced:

Los Alamos National Laboratory; Bldg 03-29; CMR Facility 550,000 sqft

10. Acquisition Approach

The CMRR Acquisition Strategy is based on procurement strategies specific for each major component of the CMRR project in order to mitigate overall technical and schedule risk. The RLUOB was implemented via LANL-issued design-build subcontract based on performance specifications developed during CMRR Conceptual Design. The REI subproject was implemented via LANL-issued final design-bid build construction contracts. The REI2 subproject will be executed via LANL-issued final design-bid-build construction contracts. The PEI subproject will be executed via LANL-issued final design, and the construction will be self-performed in the PF-4. Selected non-nuclear will be executed via the US Army Corps of Engineers. The performance baseline will be established upon completion of 90% design maturity to allow development of credible cost estimates in accordance with DOE Order 413.3B and NNSA policy.

Secure Transportation Asset

Overview

The Secure Transportation Asset (STA) program safely and securely transports nuclear weapons, weapons components, and special nuclear materials to meet projected Department of Energy (DOE), Department of Defense (DoD), and other customer requirements.

The STA program includes Operations and Equipment and Program Direction subprograms. The Operations and Equipment subprogram provides for STA's transportation service infrastructure, which is critical in meeting the nuclear security enterprise initiatives documented in the Stockpile Stewardship Management Plan and the Nuclear Posture Review. The Program Direction subprogram provides for the federal agents and the secure transportation workforce.

The STA current capacity will meet the prioritized NNSA Stockpile refurbishment and modernization initiatives and other DOE workload. The Secure Transportation Steering Committee will continue to balance and prioritize customer requests against STA capacity. Since its formal creation in 1974, the program has maintained its long legacy of no loss of cargo and no radiological release on any shipment. However, STA needs to replace aging transportation assets and communication systems to maintain the required convoy security profile.

Highlights of the FY 2016 Budget Request

The pillars of the STA security concept are specialized vehicles (including highly secure trailers), highly trained agents and robust communication systems. The $251,610,000 FY 2016 budget request is $32,610,000 or 14.9 percent above the FY 2015 enacted level to continue asset modernization and workforce capability initiatives. These initiatives include the Safeguards Transporter (SGT) Risk Reduction Initiatives to extend the life of the SGT; Analysis of Alternatives for the Mobile Guardian Transporter (MGT) development, testing and production; deployment of the Advanced Radio Enterprise System (ARES); replacement of vehicles and tractors; and restoration of federal agent strength levels. Additionally, STA will ensure all of its supporting systems remain efficiently integrated to support Defense Programs.

The STA is a an organization of integrated systems; a funding change in one system can drive fluctuations in requirements in other areas and STA must mitigate the cost, scope, and schedule risks that the interconnected activities can introduce.

As the SGT nears the end of its 20 year service life, the STA has begun planning for the next-generation secure trailer, the MGT. The initial estimate of MGT costs through the FYNSP was based on inflation –adjusted SGT historical costs. However, based on the conceptual design effort, the selected trailer came in at a substantially higher cost estimate. Results from a rigorous Analysis of Alternatives using independent cost estimates will be used to inform the procurement decision. Furthermore, the MGT project will shift from Standard Management to Enhanced Management B under the Defense Programs Program Execution Guide.

Since the earliest possible date to field a new trailer is FY 2020, STA will implement a risk reduction effort to determine costs associated with keeping at least a portion of the SGT fleet in operation beyond the 20-year service life.

The completion of the ARES deployment raises convoy communications to an enhanced level, allowing for a situational awareness system to be installed in the vehicle fleet. At the same time that new vehicles are being equipped with ARES, the existing fleet is retrofitted. In FY 2016, ARES moves from production to sustainment.

The Trailer Communication System (TCS) provides the communication systems interface from the trailers to the escort vehicles. The current TCS was developed over 20 years ago as part of the SGT design, and is no longer sustainable. The TCS upgrade will operate in a hardware platform that will be expandable and flexible for future upgrades, maintain 100 percent backward compatibility with the current SGT fleet vehicles, and be forward compatible to the new MGT. With its three-year development phase complete by 2015, the TCS activity will shift to full production.

The combined effect of cancelling some of the Agent Candidate Training (ACT) classes due to budget uncertainties, and varying rates of attrition have lowered agent strength levels such that STA must commit itself to a stable human resources strategy to achieve an optimal agent force structure. It takes many years to achieve any substantial growth to the agent force.

FY 2016 funding for the Pantex and Y-12 Sites incorporate a change in the site's cost model for all NNSA programs, and a reduced fee rate under the Consolidated Nuclear Security (CNS) contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution. For STA, there are CNS cost model funding increases offset by other decreases for CNS within NNSA that do not change program scope.

Major Outyear Priorities and Assumptions

Outyear funding levels for STA total $1,102,899 for FY 2017 through FY 2020. The STA has identified key strategies to guide the Office of Secure Transportation over the next five to ten years. These strategies are in line with, and support the Department's Strategic Objective 4 -- Maintain the safety, security and effectiveness of the Nation's nuclear deterrent without nuclear testing.

Secure Transportation Asset
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Secure Transportation Asset (STA)					
Operations and Equipment	112,882	116,382	121,882	146,272	+24,390
Program Direction	97,118	93,618	97,118	105,338	+8,220
Total, Secure Transportation Asset	**210,000**	**210,000**	**219,000**	**251,610**	**+32,610**

Outyears for Secure Transportation Asset
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Secure Transportation Asset (STA)				
Operations and Equipment	157,820	162,721	165,954	169,229
Program Direction	108,595	110,647	112,838	115,095
Total, Secure Transportation Asset	**266,415**	**273,368**	**278,792**	**284,324**

Secure Transportation Asset
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Operations and Equipment: The funding increase supports the SGT risk reduction initiatives and proceeding with the development of the MGT option selected through the Analysis of Alternatives to include the MGT conceptual and baseline designs. It also supports production of the Trailer Communication System (TCS); Production of eight Support Vehicles; Production of six Replacement Armored Tractors and 15 Escort Vehicle—Light Chassis; contractual services in support of ACT training and munitions; sustainment of the Advanced Radio Enterprise System (ARES); and the integration of business functions and processes that control, assist, and direct secure transportation operations. Additionally, there are CNS cost model funding increases offset by other decreases for CNS within NNSA that do not change program scope.	**+24,390**
Program Direction: The increase supports two 24 man ACT courses to include salaries, overtime, travel, and the backfill of staff vacancies. The manpower provides the Direct Federal support for the transport of nuclear weapons, components and special nuclear materials to support the nuclear security enterprise. The increase also supports the application of the Human Reliability Program requirements to designated positions, including the agent recruits and payment for facility maintenance.	**+8,220**
Total, Secure Transportation Asset	**+32,610**

Secure Transportation Asset
Operations and Equipment
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Secure Transportation Asset (STA)					
Operations and Equipment					
Mission Capacity	62,222	64,746	73,549	90,443	+16,894
Security/Safety Capability	19,852	18,764	17,586	20,513	+2,927
Infrastructure and C5 Systems	20,724	23,328	21,115	24,338	+3,223
Program Management	10,084	9,544	9,632	10,978	+1,346
Total, Operations and Equipment	**112,882**	**116,382**	**121,882**	**146,272**	**+24,390**

Outyears for Secure Transportation Asset
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Secure Transportation Asset (STA)				
Operations and Equipment				
Mission Capacity	100,481	102,516	106,064	104,987
Security/Safety Capability	21,128	20,896	21,563	23,372
Infrastructure and C5 Systems	25,068	27,963	26,808	29,181
Program Management	11,143	11,346	11,519	11,689
Total, Operations and Equipment	**157,820**	**162,721**	**165,954**	**169,229**

Secure Transportation Asset
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Mission Capacity: The funding increase supports the SGT risk reduction initiatives and the development of the MGT option selected through the Analysis of Alternatives process to include conceptual and baseline designs. It also supports production of the Trailer Communication System (TCS), eight Support Vehicles, six Replacement Armored Tractors and 15 Escort Vehicle—Light Chassis. FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.	**+16,894**
Security/Safety Capability: The funding increase supports contractual services in support of ACT, agent training and security-related activities to validate TSS system effectiveness and munitions.	**+2,927**
Infrastructure and C5 Systems: The increase supports costs for wireless services associated with ARES deployment and rehabilitation of existing facilities that house STA personnel.	**+3,223**
Program Management: The funding increase provides contractor support for execution of organizational program requirements.	**+1,346**
Total, Secure Transportation Asset/Operations and Equipment	**+24,390**

Secure Transportation Asset
Operations and Equipment

Description
Within the STA Operations and Equipment Activity, four subprograms make unique contributions to the safety and security of the nuclear stockpile. These subprograms accomplish the following: (1) Mission Capacity - provides agent candidate training to maintain federal agent workforce, provides mission-essential agent equipment, uniforms or allowances as authorized by 5 U.S.C. 5901-5902, maintains and provides the transportation fleet and aviation services; (2) Security/Safety Capability - develops and implements new fleet technologies, executes agent sustainment training and implements Security, Safety and Emergency Response programs; (3) Infrastructure and C5 systems - provides support for minor construction projects and C5 (command and control, communication, computer, and cyber) systems; and (4) Program Management - provides corporate functions and business operations that control, assist and direct secure transport operations.

The Mission Capacity subprogram sustains STA systems capacity through equipment purchases and maintenance of the agent manpower to fulfill the present transportation requirements. This funding area includes the following activities: (1) Conducts Agent Candidate Training (ACT) classes to maintain the agent end-strength. Funding supports the recruiting, equipping, and training of federal agent candidates necessary to maintain the workforce impacted by attrition. (2) Replaces the aging vehicle fleet with newly designed vehicles. Funding supports the design, engineering, testing, and fielding of specialized vehicles, tractors, and trailers necessary for successful convoy operations. (3) Maintains the aviation program. Funding supports the maintenance and sustainment of the aircraft fleet. (4) Maintains readiness posture of the STA fleet.

Major Outyears Priorities and Assumptions

Modernize Mission Assets and Infrastructure
STA must maintain assets to support current and future missions based on changing customer needs, budgets, and threats. These assets include vehicles (tractors, trailers, and escort vehicles), facilities, and aircraft. Modernizing and sustaining these assets requires an integrated, long-term strategy and plan, and a substantial investment. The STA strategy includes eliminating outdated assets, refurbishing existing assets to extend their useful life, and procuring new assets.

Strengthen Mission Support Systems
Mission support systems provide the critical information necessary to ensure mission success. This includes the information that is obtained, analyzed, and disseminated prior to the mission; the continuous monitoring of that information to ensure it is accurate and valid; and the constant communication within the mission teams and between the teams and headquarters. All of this must be accomplished seamlessly in real-time, while balancing the evolving requirements of cyber security to ensure system reliability and integrity. Additionally, STA will leverage other information technology systems supporting business processes and operations to improve the efficiency and effectiveness of the STA mission.

FY 2017-FY 2020 Key Milestones
- FY2016- Complete production of new trailer communication system
- FY2015 -Complete SGT Risk Reduction Program
- FY2018 -Complete production of Replacement Armored Tractor
- FY2020 - Complete MGT final design and initiate activities for a MGT FPU

The Security/Safety Capability subprogram funding supports the following sub-elements: (1) Identifies, designs, and tests new fleet and mission technologies. Funding supports safety and security upgrades as well as enhancements to the secure trailers, analysis of intelligence data, dissemination of information and the application of emerging physical security technology. (2) Sustains and supports intensified training. Funding supports the technical equipment, logistics, curriculum development, and staffing necessary to conduct Special Response Force (SRF) training, Operational Readiness Training (ORT), Validation Force-on-Force (VFOF) exercises, and agent sustainment training. Sustainment training includes, but is not limited to, surveillance detection, tactics, advanced driving, firearms and mission operations. Funds are utilized to obtain off-site training venues capable of supporting units or commands which are necessary to maintain specialized

federal agent skills and qualifications, including off-road drive and weapon training. (3) Maintains security and safety programs. Funding supports liaison with state and local law enforcement organizations; analysis of security methods and equipment; vulnerability assessments; development of the Safeguards and Security Plan and combat simulation computer modeling; validation of safety and security; and execution of safety studies and safety engineering for the Safety Basis, Nuclear Explosive Safety, and over-the-road safety issues. (4) Maintains the NNSA Emergency Operations Center (EOC) in Albuquerque, New Mexico, and trains and exercises the STA response capability. Funding supports the Emergency Management Program to include Federal Agent Incident Command System refresher and sustainment training.

FY 2017-FY 2020 Key Milestones

- Conduct annual Operational Readiness Training.
- Conduct annual Validation Force-on-Force.
- Conduct performance-based assessments to evaluate critical system elements.
- Validate security methods and systems.

The Infrastructure and classified command and control, communication, computer, and cyber (C5) Systems subprogram funding sustains the infrastructure and command and control system platforms that the STA operates. This funding supports the following sub-elements: (1) Modernize and maintain C5 systems activities to maintain vigilant oversight of nuclear convoys. Funding supports operation of the Transportation Emergency Control Centers, communications maintenance, and the costs for operating relay stations in five states. (2) Expand, upgrade and maintain the STA facilities and equipment in support of federal agents and projected workload. Funding supports the utilities, maintenance, upgrades and required expansion projects for approximately 68 facilities and their respective equipment. Facilities include, but are not limited to, federal agent commands, vehicle electronic and mechanical maintenance facilities, relay stations, training facilities, and facilities utilized to house support staff.

FY 2017-FY 2020 Key Milestones

- Maintain infrastructure and C5 systems to support mission operations and agent training requirements.
- Sustain the STA facilities to support mission operations.

The Program Management subprogram funding creates a well-managed, responsive, and accountable organization by employing effective business practices. This goal includes the following: (1) Provide for corporate functions including, technical document support and business operations that control, assist, and direct secure transport operations. This includes supplies, equipment and technical document production and regulation control processes. (2) Assess, evaluate and improve work functions and processes. Funding supports quality studies, self-inspections, routine STA intranet web support, configuration management, and business integration activities.

FY 2017-FY 2020 Key Milestones

- Update vehicle maintenance training manuals associated with vehicle modification upgrades and communication capabilities.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Mission Capacity $73,549,000	**Mission Capacity $90,443,000**	**Mission Capacity +$16,894,000**
• Complete initial cost estimate of SGT Risk Reduction Program. • Develop and implement the SGT's systems extension plan. • Complete MGT Analysis of Alternatives Study. • Develop metrics for managing vehicle maintenance facilities and monitoring fleet reliability. • Complete 737 aircraft avionics upgrade, ballast installation and fuel tank suppression on both aircraft. Implement and integrate mission operational law enforcement requirements into ACT and other corporate training programs.	• The MGT conceptual design and down select process will be used to finalize the conceptual and baseline designs. • Obtain international Standards for Business Aircraft Stage II Certification. • Re-compete the aviation maintenance contract.	• The increase of $16,894 thousand supports the SGT risk reduction initiatives and development of the MGT option selected through the Analysis of Alternatives process. It also supports production of the Trailer Communication System (TCS); Production of eight Support Vehicles; Production of six Replacement Armored Tractors and 15 Escort Vehicle—Light Chassis and aviation operations.
Security/Safety Capability $17,586,000	**Security/Safety Capability $20,513,000**	**Security/Safety Capability +$2,927,000**
• Assess, identify, and develop National Incident Management System (NIMS) / Incident Command (ICS) requirements for agents and staff. • Complete the NIMS/ICS training implementation plan. • Develop a five year organizational plan for the conduct of an annual EM/ICS training. • Create and publish a comprehensive Qualification and Currency Manual. • Install accredited HQ-sponsored IT systems within the Domain Awareness Cell (DAC).	• Implement a uniform and accredited NIMS/ICS training program for agents and staff. • Achieve full implementation of incumbent agent physical readiness training. • Conduct an OST operational emergency response exercise.	• The increase of $2,927 thousand supports the contractual services associated with Federal Agent training at off-site venues along with the validation of security methods and systems.
Infrastructure and C5 Systems $21,115,000	**Infrastructure and C5 Systems $24,338,000**	**Infrastructure and C5 Systems +$3,223,000**
• Achieve final operational capability at the alternate operations facility. • Produce the First Production Unit of the strategic trailer communications. • Integrate and exploit Mission Management System	• Complete fielding and training of ARES and exploit tactical enhancements. • Complete the Iridium GPS System V2 installation.	• The increase of $3,223 thousand supports the rehabilitation of existing facilities that house STA personnel.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
tools in Transportation Command and Control System TCCS.		
Program Management $9,632,000	**Program Management $10,978,000**	**Program Management +$1,346,000**
• Implement and apply project management requirements and methodologies to OST-designated projects. • Establish project management training for designated OST managers. • Develop and track metrics to compare operational capacity and actual workload. • Develop a personnel management tool to accurately measure agent operational tempo at the unit level and collect data to provide a baseline assessment.	• Execute all OST-designated projects in accordance with an approved project management plan using prescribed estimating methods. • Integrate the TCCS Mission Management System (MMS) and personnel management tools to provide near-real time personnel management at the unit level and build data files for metrics.	• The increase of $1,346 thousand supports the management of a responsive and accountable organization to include project management activities as well as tracking and trending.

Secure Transportation Asset Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Safe and Secure Shipments - Annual percentage of shipments completed safely and securely without compromise/loss of nuclear weapons/components or a release of radioactive material.							
Target	100% of shipments	100% of shipments	100% of shipments	100% of shipments	100% of shipments	100% of shipments	100% of shipments
Result	100						
Endpoint Target	Annually, ensure that 100% of shipments are completed safely and securely without compromise/loss of nuclear weapons/components or a release of radioactive material.						

Secure Transportation Asset
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	101,402	74,871	8,619	8,619	8,909	9,003	+94
Plant Projects (GPP) (<$10M)	13,969	11,494	807	807	825	843	+18
Total, Capital Operating Expenses	**115,371**	**86,365**	**9,426**	**9,426**	**9,734**	**9,846**	**+112**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	101,402	74,871	8,619	8,619	8,909	9,003	+94
Total, Capital Equipment (including MIE)	**101,402**	**74,871**	**8,619**	**8,619**	**8,909**	**9,003**	**+94**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**13,969**	**11,494**	**807**	**807**	**825**	**843**	**+18**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**13,969**	**11,494**	**807**	**807**	**825**	**843**	**+18**
Total, Capital Summary	**115,371**	**86,365**	**9,426**	**9,426**	**9,734**	**9,846**	**+112**

Outyears for Secure Transportation Asset

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	9,201	9,403	9,610	+9,821
Plant Projects (GPP) (<$10M)	862	881	900	+920
Total, Capital Operating Expenses	**10,063**	**10,284**	**10,510**	**10,741**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	9,201	9,403	9,610	+9,821
Total, Capital Equipment (including MIE)	**9,201**	**9,403**	**9,610**	**+9,821**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	862	881	900	+920
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**862**	**881**	**900**	**+920**
Total, Capital Summary	**10,063**	**10,284**	**10,510**	**+10,741**

Secure Transportation Asset
Program Direction

Overview

STA Program Direction provides for personnel to enhance the safety and security of the nuclear stockpile by: (1) conducting armed escorts of nuclear weapons, material, and components; (2) conducting air movements of limited life components and federal agents; (3) tracking nuclear convoys and providing emergency response capability; (4) performing staff oversight of three federal agent commands; (5) providing oversight to the design and implementation of classified security technologies; (6) providing critical skills training to the federal agent force and staff; (7) staffing and operating TRACOM, training command, and conducting two 21-week training classes per year for new agents, and (8) performing administrative and logistical functions for the organization.

The total FTEs also support the federal agent force, federal pilots, emergency management, security and safety programs, and all other key elements of the STA mission.

Highlights of the FY 2016 Budget Request

The STA will continue efforts to increase the federal agent strength to support workload requirements and provide Defense Programs with a stable asset for planning LEP's and weapon campaigns. This will be accomplished by recruiting federal agents and conducting agent candidate classes. STA will support key safety-related initiatives to reduce worker's compensation expenditures. In addition, STA will support travel required to transport nuclear weapons, components, and special nuclear material and also validate safety and security requirements associated with weapon consolidation initiatives. The increased agent force will affect the costs for the Human Reliability Program, and employee assistance programs. There will also be increases in fees associated with facility operations at the Albuquerque Complex as well as services provided by the Department's Common Operating Environment.

Major Outyears Priorities and Assumptions

Continuously Improve Workforce Capability and Performance

Although assets and infrastructure are essential for successful mission implementation, the workforce is STA's most valuable and important resource. The skill and talent base required to support the mission must be continuously replenished, developed, and maintained. This includes everyone in the organization, from federal agents to senior management. Initial and continuing training and development programs will ensure existing staff is competent and proficient in their current positions. The STA will recruit highly experienced and innovative personnel, retain experienced personnel, and develop strategic plans for human resource management.

Drive an Integrated and Effective Organization

The STA will continuously monitor, evaluate, and improve operations to ensure mission is always achieved in an ever-changing operational environment. This includes activities that are directly related to the mission such as safeguards and security requirements and the business process operations in the organization. The STA will continue to strive to eliminate redundancies, improve performance and efficiency, and streamline operations.

Secure Transportation Asset
Program Direction
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Secure Transportation Asset (STA)					
Program Direction - Albuquerque					
Salaries and Benefits	80,056	76,053	77,902	84,062	+6,160
Travel	6,647	6,050	5,792	5,913	+121
Other Related Expenses	10,415	11,515	13,424	15,363	+1,939
Total, Program Direction - Albuquerque	**97,118**	**93,618**	**97,118**	**105,338**	**+8,220**
FTEs	**562**	**562**	**566**	**579**	**+13**

Outyears for Secure Transportation Asset
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Secure Transportation Asset (STA)				
Program Direction - Albuquerque				
Salaries and Benefits	86,677	88,728	90,917	93,417
Travel	6,404	6,279	6,007	6,051
Other Related Expenses	15,514	15,640	15,914	15,627
Total, Program Direction - Albuquerque	**108,595**	**110,647**	**112,838**	**115,095**
FTEs	**584**	**590**	**594**	**600**

Secure Transportation Asset
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Salaries and Benefits: The increase supports the projected federal agent requirements, overtime, and application of inflation to salaries and benefits.	**+6,160**
Travel: The increase supports over-the-road transportation operations to include increased lodging and rental vehicle costs.	**+121**
Other Related Expenses: The increase supports the Albuquerque complex fee and facility maintenance.	**+1,939**
Total, Secure Transportation Asset/Program Direction	**+8,220**

Secure Transportation Asset
Program Direction

Description

The STA Program Direction provides personnel to enhance the safety and security of the nuclear stockpile by: (1) conducting armed escorts of nuclear weapons, materials, and components; (2) conducting air movements of limited life components and federal agents; (3) tracking nuclear convoys and providing emergency response capability; (4) performing staff oversight of three federal agent commands; (5) providing oversight to the design and implementation of classified security technologies; (6) providing critical skills training to the federal agent force and staff; (7) staffing and operating the Training Command and conducting two 21-week training classes per year for new agents, and (8) performing administrative and logistical functions for the organization.

The total FTEs also support the federal agent force, federal pilots, emergency management, security and safety programs and all other key elements of the STA mission. The onboard count may not match the FTEs and funding allocations account for projected/average vacancy rates.

Salaries and benefits are provided for the program staff at Albuquerque, New Mexico and Fort Chaffee, Arkansas for federal agents and the support staff at the three federal agent force locations (Albuquerque, New Mexico; Oak Ridge, Tennessee; and Amarillo, Texas). It also includes overtime, workmen's compensation, and health/retirement benefits associated with federal agents, secondary positions, and support staff.

FY 2017-FY 2020 Key Milestones

- Support multiple LEP transport priorities and other prioritized missions.
- Restore Federal Agent strength levels to support mission requirements.

Travel is associated with secure convoys, training at other federal facilities and military installations, and program oversight.

FY 2017-FY 2020 Key Milestones

- Support travel to meet prioritized missions.

Other Related Expenses provides required certification training for the handling of nuclear materials by federal agent forces, as well as staff professional development. Maintains a human reliability program for federal agents and staff. Provides for Permanent Change of Station (PCS) moves and other Contractual Service requirements such as facility maintenance and the Albuquerque Complex fee, which includes a portion of the security, utilities and other services rendered. Also includes payment for the Department of Energy Common Operating Environment (DOECOE) services.

FY 2017-FY 2020 Key Milestones

- Continue to identify methods that streamline the management and adjudication of human reliability issues, while maintaining the high standards for nuclear material courier duties.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Salaries and Benefits $77,902,000	**Salaries and Benefits $84,062,000**	**Salaries and Benefits +$6,160,000**
• Recruit, hire, and retain quality personnel based on an analysis of current and future mission needs. • Fill agent vacancies to support workload requirements. • Effectively manage overtime expenditures. • Conduct agent candidate classes. • Support key safety-related initiatives to reduce workers' compensation expenditures.	• Recruit, hire, and retain quality personnel based on an analysis of current and future mission needs. • Continue to fill agent vacancies to support workload requirements. • Continue to effectively manage overtime expenditures. • Continue to conduct agent candidate classes. • Continue to support key safety-related initiatives to reduce worker's compensation expenditures.	• The increase of $6,160 thousand supports a total of approximately 579 Federal Agents and staff FTEs.
Travel $5,792,000	**Travel $5,913,000**	**Travel +$121,000**
• Support travel required to transport nuclear weapons, components, and special nuclear material. • Support federal facilities that provide unique training to maintain agent skill sets. • Support travel to identify and validate safety and security requirements associated with the weapon consolidation initiatives.	• Continue to support travel required to transport nuclear weapons, components, and special nuclear material. • Continue to support federal facilities that provide unique training to maintain agent skill sets. • Continue to support travel to identify and validate safety and security requirements associated with the weapon consolidation initiatives.	• The increase of $121 thousand is attributable to mission related travel costs for Federal Agents and staff.
Other Related Expenses $13,424,000	**Other Related Expenses $15,363,000**	**Other Related Expenses +$1,939,000**
• Support the fees paid to the Albuquerque Complex. • Support the fees for services provided by the Department's Common Operating Environment. • Provide for legal fees, employee assistance program, and transit subsidy. • Complete the analysis of the Human Reliability Program strengths and weaknesses and implement recommendations.	• Begin planning for transition of the Albuquerque Complex. • Apply HRP to ACT candidates.	• The increase of $1,939 thousand supports the complex fee and facility maintenance.

Nuclear Counterterrorism Incident Response
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nuclear Counterterrorism Incident Response [a]					
Emergency Response	143,748	142,101	142,577	0	-142,577
National Technical Nuclear Forensics	11,000	11,648	10,250	0	-10,250
Emergency Management	6,195	6,195	5,668	0	-5,668
Operations Support	8,350	8,350	14,850	0	-14,850
International Emergency Management and Cooperation	7,000	8,277	4,595	0	-4,595
Nuclear Counterterrorism	51,950	51,950	0	0	0
Total, Nuclear Counterterrorism Incident Response [a]	**228,243**	**228,521**	**177,940**	**0**	-177,940

Outyears for Nuclear Counterterrorism Incident Response
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Nuclear Counterterrorism Incident Response [a]				
Emergency Response	0	0	0	0
National Technical Nuclear Forensics	0	0	0	0
Emergency Management	0	0	0	0
Operations Support	0	0	0	0
International Emergency Management and Cooperation	0	0	0	0
Nuclear Counterterrorism	0	0	0	0
Total, Nuclear Counterterrorism Incident Response [a]	**0**	**0**	**0**	**0**

[a] The Nuclear Counterterrorism Incident Response Program is proposed to be transferred from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation starting in FY 2016.

Counterterrorism and Counterproliferation Programs
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Counterterrorism and Counterproliferation Programs [a]					
Counterterrorism and Counterproliferation	0	0	46,093	0	-46,093
Total, Counterterrorism and Counterproliferation Programs [a]	**0**	**0**	**46,093**	**0**	**-46,093**

Outyears for Counterterrorism and Counterproliferation Programs
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Counterterrorism and Counterproliferation Programs [a]				
Counterterrorism and Counterproliferation	0	0	0	0
Total, Counterterrorism and Counterproliferation Programs [a]	**0**	**0**	**0**	**0**

[a] The Counterterrorism and Counterproliferation Program has been merged with Nuclear Counterterrorism Incident Response, and moved from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation starting in FY 2016.

Infrastructure and Safety
(Formerly part of Readiness in Technical Base and Facilities and Site Stewardship)

Overview

The Infrastructure and Safety program is proposed as a new Government Performance and Reporting Act (GPRA) unit program starting in FY2016. The mission is to maintain, operate, and modernize the National Nuclear Security Administration (NNSA) infrastructure in a safe, secure, and cost-effective manner to enable program results. This mission directly supports the Department of Energy (DOE) Nuclear Security goal to strengthen national security by maintaining and modernizing the nuclear stockpile and nuclear security infrastructure, reducing global nuclear threats, providing for nuclear propulsion, improving physical and cybersecurity, and strengthening key science, technology, and engineering capabilities. Infrastructure and Safety efforts are focused on core, shared, and base infrastructure and organized around five elements – Operations of Facilities, Safety Operations, Maintenance, Recapitalization, and Line Item Construction. Together these elements provide a comprehensive approach to arresting the declining state of NNSA infrastructure. NNSA uses a prioritized enterprise risk management criteria to maximize return on investment, enable program results and reduce enterprise risk.

In order to more clearly communicate spending priorities and decisions, a portion of scope and funding from the Readiness in Technical Base and Facilities (RTBF) and Site Stewardship programs have been transferred to the Infrastructure and Safety program. The Operations of Facilities, Containers, and Maintenance subprograms, as well as base infrastructure related line item construction projects were transferred from RTBF. A portion of the Recapitalization subprogram that supports general infrastructure and is not aligned to one specific mission was also transferred from RTBF. In addition, the Nuclear Criticality Safety Program (NCSP) and Nuclear Safety Research and Development (NSR&D) activities within the Program Readiness subprogram were transferred from RTBF. The Environment Project and Operations (EPO) subprogram was also transferred from the Site Stewardship program. Containers, NCSP, NSR&D and EPO activities are now within the new Safety Operations subprogram. Containers is now titled “Packaging” and EPO is now titled “Long-Term Stewardship” (LTS).

Operations

The Operations program consists of the Operations of Facilities and Safety Operations subprograms:

Operations of Facilities

The Operations of Facilities subprogram provides the funding required to operate NNSA facilities and support the underlying infrastructure and capabilities at the level necessary to deliver mission results in a safe and secure manner. The Operations of Facilities subprogram is fundamental to achieving NNSA’s plutonium, uranium, tritium, lithium, high explosives, and other mission objectives. It includes essential support such as water and electrical utilities, safety systems, lease agreements for facilities and land, emergency response services, and other critical systems. This subprogram also provides resources for environment, safety, health, and quality (ESH&Q) costs associated with ensuring compliance with federal, state, and local environmental and worker safety and health regulations as well as applicable DOE Orders and Directives.

Safety Operations

The new Safety Operations subprogram provides for the Department’s Nuclear Criticality Safety Program, Nuclear Safety Research and Development (formerly part of Program Readiness), Packaging (formerly Containers) and Long Term Stewardship (formerly EPO) activities.

The Nuclear Criticality Safety Program (NCSP) develops, maintains and disseminates the essential technical tools, training and data required to support safe, efficient fissionable material operations within DOE. The Nuclear, Safety Research and Development (NSR&D) activities provide code development, generation of experimental data, and engineering studies to inform and improve the technical basis relied upon in the Documented Safety Analysis for DOE/NNSA nuclear facilities. The Packaging activity provides off-site shipping container research and development, design, certification, recertification, test and evaluation, production and procurement, fielding and maintenance, and decontamination and disposal. It also provides for off-site transportation authorization of shipping containers for nuclear materials and components supporting the nuclear weapons program along with nuclear non-proliferation and other mission areas.

Long-Term Stewardship (LTS) supports the ongoing mission by protecting human health and the environment and ensuring a safe working environment by reducing exposure to hazardous and radioactive legacy contamination. LTS includes activities necessary to meet federal and state environmental regulatory requirements identified in legally enforceable site permits, cleanup agreements, and legislation to ensure safe cleanup levels are met, such as operating and maintaining remediation systems and monitoring contaminant levels in the soil and groundwater.

Maintenance
The Maintenance subprogram provides direct funded maintenance activities across the NNSA enterprise to support the recurring day-to-day work that is required to sustain and preserve NNSA facilities and equipment in a condition suitable for their designated use. These efforts include predictive, preventive, and corrective maintenance activities to maintain property, assets, systems, roads, and equipment and the required maintenance and surveillance of vital safety systems.

Recapitalization
The Recapitalization subprogram is the key to arresting the declining state of NNSA infrastructure. A dedicated recapitalization investment is needed to overcome the current numerous obsolete support and safety systems and to revitalize facilities that are well beyond their end of life. The Recapitalization program provides for the modernization of NNSA infrastructure by prioritizing investments to improve the condition and extend the design life of the structures, capabilities or systems. These activities include upgrading aging NNSA infrastructure and improving the safety and quality of the workplace for NNSA's talented and dedicated workforce. Recapitalization also improves the reliability, sustainability and efficiency of NNSA's core infrastructure to reduce overall operating costs. Recapitalization enables NNSA to reduce the safety, security, environmental and program risks posed by the aging infrastructure.

The Recapitalization subprogram includes costs for minor construction projects, Capital Equipment projects, replacement projects, and Other Project Costs (OPC) for Infrastructure and Safety-related line item construction projects. Recapitalization funds are also used to deactivate and dispose of infrastructure that is no longer needed thus reducing surveillance and maintenance costs of obsolete facilities and significantly lowering risks to worker, the public, the environment, and program objectives.

Construction
The Infrastructure and Safety Construction projects play a critical role in revitalizing the nuclear security enterprise including base infrastructure. Construction investments will replace obsolete and unreliable facilities and infrastructure to reduce safety and program risk as well as improve the responsiveness and/or utility of the infrastructure and its technology base.

Highlights of the FY 2016 Budget Request
The FY 2016 Infrastructure and Safety budget request totals $1,466,134 which represents the next step of a long-term effort to arrest the declining state of NNSA infrastructure by increasing funding for Recapitalization and Line Item Construction. These increases will support vital NNSA program requirements while allowing NNSA to execute additional recapitalization projects that address critical safety and program risks, such as ensuring enriched uranium capabilities at Y-12 National Security Complex (Y-12) in accordance with the new strategy; improving seismic and criticality safety systems for plutonium facilities at Los Alamos National Laboratory (LANL); replacing obsolete fire protection systems at the Nevada National Security Site (NNSS), Y-12 and Pantex Plant; replacing multiple mission-critical ventilation systems at Lawrence Livermore National Laboratory (LLNL); and preparing the Kansas City Bannister Road Complex for transfer to a private entity. The funding request for FY 2016 continues the design and starts the construction of an Emergency Operations Center at Y-12 and starts design and construction for one new project: Substation Replacement at TA-3, LANL. In addition, the FY 2016 budget will support halting the growth in deferred maintenance backlog.

Major Outyear Priorities and Assumptions
Outyear funding levels for Infrastructure and Safety total $6,346,569 for FY 2017 through FY 2020. The FY 2017–FY 2020 request assumes continued steady funding for maintenance and recapitalization to reduce safety and programmatic risks, buy down the deferred maintenance backlog and execute high-priority recapitalization projects, highlighted by $200,000,000 in FY 2017 for transfer of the Kansas City Bannister Road Complex to a private entity. The outyear funding also continues vital investments in the development and execution of strategies to maintain the nation's uranium and plutonium capabilities and manage the risk associated with transition out of Building 9212.

Infrastructure and Safety
(Formerly part of Readiness in Technical Base and Facilities and Site Stewardship)
Funding (Non-comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Infrastructure and Safety					
Operations					
Operations of Facilities					
Kansas City Plant	0	0	0	100,250	+100,250
Lawrence Livermore National Laboratory	0	0	0	70,671	+70,671
Los Alamos National Laboratory	0	0	0	196,460	+196,460
Nevada National Security Site	0	0	0	89,000	+89,000
Pantex Plant	0	0	0	58,021	+58,021
Sandia National Laboratory	0	0	0	115,300	+115,300
Savannah River Site	0	0	0	80,463	+80,463
Y-12 National Security Complex	0	0	0	120,625	+120,625
Total, Operations of Facilities	**0**	**0**	**0**	**830,790**	**+830,790**
Safety Operations	0	0	0	107,701	+107,701
Maintenance	0	0	0	227,000	+227,000
Recapitalization	0	0	0	257,724	+257,724
Total, Operations	**0**	**0**	**0**	**1,423,215**	**+1,423,215**
Construction	**0**	**0**	**0**	**42,919**	**+42,919**
Total, Infrastructure and Safety	**0**	**0**	**0**	**1,466,134**	**+1,466,134**

Outyears for Infrastructure and Safety
(Formerly part of Readiness in Technical Base and Facilities and Site Stewardship)
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Infrastructure and Safety					
Operations					
Operations of Facilities					
Kansas City Plant	135,834	135,502	125,000	100,250	-24,750
Lawrence Livermore National Laboratory	77,287	76,367	71,000	70,671	-329
Los Alamos National Laboratory	213,707	213,707	198,000	196,460	-1,540
Nevada National Security Site	100,929	99,953	89,000	89,000	+0
Pantex Plant	81,420	79,334	75,000	58,021	-16,979
Sandia National Laboratory	115,000	119,500	106,000	115,300	+9,300
Savannah River Site	90,236	90,236	81,000	80,463	-537
Y-12 National Security Complex	170,042	165,887	151,000	120,625	-30,375
Total, Operations of Facilities	**984,455**	**980,486**	**896,000**	**830,790**	**-65,210**
Safety Operations	102,001	101,207	92,941	107,701	+14,760
Maintenance	227,591	232,591	227,000	227,000	+0
Recapitalization	151,500	151,500	168,800	257,724	+88,924
Total, Operations	**1,465,547**	**1,465,784**	**1,384,741**	**1,423,215**	**+38,474**
Construction	**0**	**0**	**2,000**	**42,919**	**+40,919**
Total, Infrastructure and Safety	**1,465,547**	**1,465,784**	**1,386,741**	**1,466,134**	**+79,393**

Outyears for Infrastructure and Safety Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Infrastructure and Safety				
Operations				
Operations of Facilities				
Kansas City Plant	102,500	104,500	106,802	109,000
Lawrence Livermore National Laboratory	71,590	73,757	78,241	80,157
Los Alamos National Laboratory	198,605	203,936	215,129	219,684
Nevada National Security Site	90,000	91,000	94,000	95,000
Pantex Plant	58,927	60,767	62,663	64,616
Sandia National Laboratory	118,800	121,300	124,700	130,300
Savannah River Site	80,244	82,558	87,969	89,273
Y-12 National Security Complex	125,295	127,629	133,077	136,190
Total, Operations of Facilities	**845,961**	**865,447**	**902,581**	**924,220**
Safety Operations	109,733	112,355	110,760	114,823
Maintenance	227,834	234,591	242,759	255,319
Recapitalization	423,935	214,462	253,108	263,681
Total, Operations	**1,607,463**	**1,426,855**	**1,509,208**	**1,558,043**
Construction	**95,000**	**51,000**	**50,000**	**49,000**
Total, Infrastructure and Safety	**1,702,463**	**1,477,855**	**1,559,208**	**1,607,043**

Readiness in Technical Base and Facilities and Site Stewardship
Proposed Budget Structure Changes

In FY 2016, a portion of scope and funding from the Readiness in Technical Base and Facilities and Site Stewardship program will be transferred to the Infrastructure and Safety Program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. This table provides the crosswalk as a basis to show comparability of scope and funding between the FY 2015 structure and the new structure for FY 2016 and beyond.

Budget Structure Crosswalk
(Dollars in Thousands)

	FY 2016 Budget Structure					
	Weapons Activities Infrastructure and Safety					
	Operations of Facilities	Safety Operations	Maintenance	Recapitalization	Construction	Total
FY 2015 Budget Structure						
Weapons Activities						
Readiness in Technical Base and Facilities						
Operating						
Operations of Facilities						
Kansas City Plant	100,250					100,250
Lawrence Livermore National Laboratory	70,671					70,671
Los Alamos National Laboratory	196,460					196,460
Nevada National Security Site	89,000					89,000
Pantex	58,021					58,021
Sandia National Laboratory	115,300					115,300
Savannah River Site	80,463					80,463
Y-12 National Security Complex	120,625					120,625
Total, Operations of Facilities						830,790
Program Readiness						
Nuclear Criticality Safety Program		23,785				23,785
Nuclear Safety Research and Development		4,000				4,000
Material Recycle and Recovery						0
Containers		27,701				27,701
Storage						0
Maintenance and Repair of Facilities			227,000			227,000
Recapitalization				257,724		257,724
Total, Operating						1,371,000
RTBF: Construction					42,919	42,919
Total, Readiness in Technical Base and Facilities						**1,413,919**
Weapons Activities						
Site Stewardship						
Environmental Projects & Operations		52,215				52,215
Nuclear Materials Integration						0
Corporate Project Management						0
MSI Partnership Program						0
Total, Site Stewardship						**52,215**
Total Weapons Activities	**830,790**	**107,701**	**227,000**	**257,724**	**42,919**	**1,466,134**

Infrastructure and Safety
(Formerly part of Readiness in Technical Base and Facilities and Site Stewardship)
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Operations of Facilities:	**-65,210**
• **Kansas City Plant (KCP)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. A decrease reflects ending full operations at Bannister Road.	**-24,750**
• **Lawrence Livermore National Laboratory (LLNL)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. No significant change to LLNL base operations.	**-329**
• **Los Alamos National Laboratory (LANL)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. No significant change to LANL base operations.	**-1,540**
• **Nevada National Security Site (NNSS)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. No change to NNSS base operations.	**0**
• **Pantex Plant**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.	**-16,979**
• **Sandia National Laboratories (SNL)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. This increase enables the Primary Standards Lab (PSL) to perform the core nuclear security enterprise mission of providing National Institute of Standards and Technology (NIST) traceable calibration standards and activities required to support diverse missions across all of the nuclear security enterprise.	**+9,300**
• **Savannah River Site (SRS)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. No significant change to SRS base operations.	**-537**

	FY 2016 vs FY 2015
• **Y-12 National Security Complex (Y-12)**: The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.	**-30,375**
Safety Operations: In FY2016, Environmental Projects and Operations, formerly in the Site Stewardship program; Containers, formerly in the Readiness in Technical Base and Facilities (RTBF) program; and the Nuclear Safety Research and Development activities and the Nuclear Criticality Safety Program activities, formerly in the Readiness in Technical Base and Facilities (RTBF) Program Readiness subprogram have been moved to the Safety Operations subprogram of the Infrastructure and Safety program. The increase restores the Nuclear Safety Research and Development activities. The increase also reconstitutes the integral experiments component for all Nuclear Criticality Safety Program sponsored work at the National Criticality Experiments Research Center (NCERC).	**+14,760**
Maintenance: The Maintenance request was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. No change to Maintenance.	**0**
Recapitalization: The Recapitalization request was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program in FY 2016. This increase supports increased investment for modernization and upgrading aging infrastructure and addresses safety and programmatic risks. Table 1 identifies specific projects that represent the current highest priority activities.	**+88,924**
Construction: The (Infrastructure and Safety) Line Item Construction Projects were formerly in the Readiness in Technical Base and Facilities (RTBF) program and have been moved to the Infrastructure and Safety program in FY 2016. The increase continues design and construction activities for the Emergency Operations Center (EOC) at Y-12 and start of design and construction of the Substation Replacement at TA-3, LANL.	**+40,919**
Total, Infrastructure and Safety	**+79,393**

Infrastructure and Safety
(Formerly part of Readiness in Technical Base and Facilities)
Operations of Facilities

Description

The Operations of Facilities subprogram provides the funding required to operate NNSA facilities and support underlying infrastructure and capabilities at the level necessary to deliver mission results in a safe and secure manner. Operations of Facilities is fundamental to achieving NNSA's plutonium, uranium, tritium, lithium, high explosives, and other mission objectives. It includes essential support such as water and electrical utilities, safety systems, lease agreements for facilities and land, emergency response services, and other critical systems. This subprogram also provides resources for environment, safety, health, and quality (ESH&Q) costs associated with ensuring compliance with federal, state, and local environmental and worker safety and health regulations as well as applicable DOE Orders and Directives.

The Operations of Facilities subprogram also funds waste management activities, including treatment, storage and waste disposition of both hazardous and radiological wastes. It provides for the daily operations, and staffing requirements, while providing activities associated with sustaining equipment, systems, facilities, or capabilities to meet design requirements and operating conditions consistent with mission requirements.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Operations of Facilities		
Kansas City Plant $125,000,000 • The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Support remaining operations and required maintenance costs at the current Bannister Road facility. Also includes funds for shutdown and surveillance activities at Bannister Road to meet regulatory requirements.	**Kansas City Plant $100,250,000** • At the Kansas City Plant, funding supports base facility operations in support of non-nuclear production. This includes facility operations, utilities, steam, gas and electric distribution, leases, program management, waste management, ES&H and industrial safety. • This also includes funds for shutdown and surveillance activities at Bannister Road to meet regulatory requirements. **FY 2017-FY 2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, waste management, ES&H and industrial safety.	**Kansas City Plant -$24,750,000** • Operations of Facilities is now funded in the new Infrastructure and Safety program. The decrease in the requested amount for Kansas City Plant is due to ending full operations at Bannister Road.
Lawrence Livermore National Laboratory $71,000,000 • The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for base facility operations to support nuclear security enterprise missions. This includes providing for facility and infrastructure operations which support plutonium, tritium and high explosives activities; environmental tests; and regulated site-wide comprehensive waste management. It also funds waste management	**Lawrence Livermore National Laboratory $70,671,000** • At the Lawrence Livermore National Laboratory, funding provides for base operations to support nuclear security enterprise missions. This includes providing for facility and infrastructure operations which support plutonium, tritium and high explosives activities; environmental tests; and regulated site-wide comprehensive waste management. It also funds waste management facilities and activities including treatment, and offsite disposal of TRU waste to the Waste Isolation Pilot Plant (WIPP).	**Lawrence Livermore National Laboratory -$329,000** • Operations of Facilities is now funded in the new Infrastructure and Safety program. No significant change to LLNL base operations.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
facilities and activities including treatment, and offsite disposal of TRU waste to the Waste Isolation Pilot Plant (WIPP).	**FY 2017-FY 2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation, industrial and high explosives safety.	
Los Alamos National Laboratory $198,000,000	**Los Alamos National Laboratory $196,460,000**	**Los Alamos National Laboratory -$1,540,000**
• The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for base facility operations in support of plutonium production, research and development; chemistry and metallurgy research; weapons engineering and tritium capability; and beryllium operations. Also, funds solid waste risk reduction activities (including ceasing low level and low-level mixed waste (LLW/LLMW) operations at Area G, Phase A site development of the Transuranic (TRU) Waste Facility, and continued processing of stored new generation TRU waste at Area G). Funds the Los Alamos Pueblo Project at approximately $800,000 per year.	• At the Los Alamos National Laboratory, funding provides for base operations in support of plutonium production, research and development; chemistry and metallurgy research; weapons engineering and tritium capability; and beryllium operations. Also, funds solid waste risk reduction activities (including ceasing low level and low-level mixed waste (LLW/LLMW) operations at Area G, and continued processing of stored new generation TRU waste at Area G). Funds the Los Alamos Pueblo Project at approximately $800,000 per year. **FY 2017-FY 2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation, industrial and high explosives safety.	• Operations of Facilities is now funded in the new Infrastructure and Safety program. No significant change to LANL base operations.
Nevada National Security Site $89,000,000	**Nevada National Security Site $89,000,000**	**Nevada National Security Site $0**
• The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in	• At the Nevada National Security Site, funding provides for base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and	• Operations of Facilities is now funded in the new Infrastructure and Safety program. No significant change to NNSS base operations.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
FY 2016. • Provides for base facility operations in support of Security Category I/II Special Nuclear Material (SNM) handling and staging; the Life Extension Programs (LEPs); the Nuclear Counterterrorism program; DOE's Nuclear Criticality Safety Program (NCSP); and legacy environmental cleanup commitments.	waste management. It also supports ES&H, which includes radiation, industrial and high explosives safety. In support of Security Category I/II SNM handling and staging; the LEPs; the Nuclear Counterterrorism program; DOE's NCSP; and legacy environmental cleanup commitments. **FY 2017-FY 2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation, industrial and high explosives safety.	
Pantex Plant $75,000,000 • The Operations of Facilities section was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for base operation costs for weapon assembly, disassembly, and surveillance in support of the LEPs; high explosives synthesis, formulation, and machining in support of production; and Special Nuclear Material non-destructive evaluation and requalification. Also funds payment in lieu of taxes.	**Pantex Plant $58,021,000** • At the Pantex Plant, funding provides for base operation costs, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation, industrial and high explosives safety to support weapon assembly, disassembly, and surveillance in support of the LEPs; high explosives synthesis, formulation, and machining in support of production; and Special Nuclear Material non-destructive evaluation and requalification. Also funds payment in lieu of taxes. **FY 2017-FY 2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management.	**Pantex Plant -$16,979,000** • Operations of Facilities is now funded in the new Infrastructure and Safety program. • FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	It also supports ES&H, which includes radiation, industrial and high explosives safety.	
Sandia National Laboratories $106,000,000	**Sandia National Laboratories $115,300,000**	**Sandia National Laboratories +$9,300,000**
• The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for major infrastructure capabilities including environmental test facilities for various environments such as electromechanical, abnormal and normal; Microelectronics Development Laboratory; Tech Area IV Accelerators; Tech Area V Nuclear Reactor facilities; Electromagnetic Test Facilities; Materials Characterization Laboratories; and Tonopah Test Range (TTR) in Nevada.	• At the Sandia National Laboratories, funding provides for major infrastructure capabilities including environmental test facilities for various environments such as electromechanical, abnormal and normal; Microelectronics Development Laboratory; Tech Area IV Accelerators; Tech Area V Nuclear Reactor facilities; Electromagnetic Test Facilities; Primary Standards Laboratory (PSL); Materials Characterization Laboratories; and Tonopah Test Range in Nevada. **FY 2017-FY 2020** • The outyears will continue to fund major infrastructure capabilities including environmental test facilities for various environments, and base operations.	• Operations of Facilities is now funded in the new Infrastructure and Safety program. The increase budget request for SNL is due to increasing base dollars to support the operations at the Primary Standards Lab.
Savannah River Site $81,000,000	**Savannah River Site $80,463,000**	**Savannah River Site -$537,000**
• The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for base facility operations in support of production, reclamation of gas transfer systems for limited life component exchange and LEPs; loading and unloading, recycling, and recovery of tritium and deuterium gases; and surveillance of Gas Transfer System (GTS).	• At the Savannah River Site, funding for base operations including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation and industrial safety, in support of production, reclamation of gas transfer systems for limited life component exchange and LEPs; loading and unloading, recycling, and recovery of tritium and deuterium gases; and surveillance of GTS.	• Operations of Facilities is now funded in the new Infrastructure and Safety program. No significant change to SRS base operations.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	FY 2017-FY 2020 • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation and industrial safety.	
Y-12 National Security Complex $151,000,000 • The Operations of Facilities was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for base operations in support of the Y-12 complex including: enriched and depleted uranium operations; lithium and other special material operations; component production and fabrication; High Enriched Uranium (HEU) down-blending activities; and weapon assembly and disassembly in support of LEPs. Also funds payment in lieu of taxes.	**Y-12 National Security Complex $120,625,000** • At the Y-12 National Security Complex, funding provides for base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation and industrial safety, in support of the Y-12 complex including: enriched and depleted uranium operations; lithium and other special material operations; component production and fabrication; HEU down-blending activities; and weapon assembly and disassembly in support of LEPs. Also funds payment in lieu of taxes. **FY 2017-FY2020** • The outyears will continue to fund base operations, including facility operations, utilities, steam, gas and electric distribution, leases, program management, and waste management. It also supports ES&H, which includes radiation and industrial safety.	**Y-12 National Security Complex -$30,375,000** • Operations of Facilities is now funded in the new Infrastructure and Safety program. • FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution.

Infrastructure and Safety
Safety Operations
(Formerly part of Readiness in Technical Base and Facilities and Site Stewardship)

Description

The new Safety Operations subprogram provides for the Department's Nuclear Criticality Safety Program, Nuclear Safety Research and Development, Packaging (formerly Containers) and Long Term Stewardship (LTS) activities (formerly Environmental Projects and Operations).

The Nuclear Criticality Safety Program (NCSP) develops, maintains and disseminates the essential technical tools, training and data required to support safe, efficient fissionable material operations within DOE. The NCSP comprises five major technical elements: Nuclear Data, Analytical Methods, Integral Experiments, Training & Education, and Information Preservation & Dissemination. A major effort within the NCSP is maintaining and operating the National Criticality Experiments Research Center (NCERC) at the Nevada National Security Site where critical and sub-critical experiments are conducted to provide tests of nuclear data, analytical codes and to develop new measurement methods. The Nuclear, Safety Research and Development (NSR&D) activities provide the technical foundation for safety analyses and controls as well as authorization basis decision making for DOE/NNSA nuclear facilities and associated operations.

The Packaging activity provides off-site shipping container research and development, design, certification, recertification, test and evaluation, production and procurement, fielding and maintenance, decontamination and disposal. It also provides off-site transportation authorization of shipping containers for nuclear materials and components supporting both the nuclear weapons program and nuclear materials consolidation.

Long-Term Stewardship (LTS) supports the ongoing mission by protecting human health and the environment and ensuring a safe working environment by reducing exposure to hazardous and radioactive legacy contamination. Long-Term Stewardship includes activities necessary to meet federal and state environmental regulatory requirements identified in legally enforceable site permits, cleanup agreements, and legislation to ensure safe cleanup levels are met, such as operating and maintaining remediation systems and monitoring contaminant levels in the soil and groundwater. Long-Term Stewardship is required to meet environmental compliance associated with the ongoing operations of a site that has a Resource Conservation and Recovery Act (RCRA) Part B Operating Permit and/or is subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Safety Operations $92,941,000	**Safety Operations $107,701,000**	**Safety Operations +$14,760,000**
Containers $26,000,000	**Packaging $27,701,000**	**Packaging +$1,701,000**
• Containers funding was formerly in the Readiness in Technical Base and Facilities (RTBF) program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for shipping container research and development, design, certification, re-certification, test and evaluation, production and procurement, fielding and maintenance, decontamination and disposal, and off-site transportation authorization of shipping containers for nuclear materials and components supporting both the nuclear weapons program and nuclear materials consolidation. • Develops new containers in response to changing regulations, which historically have been updated every 10-15 years, and were last updated in 2004. Updated regulations will put older containers in grandfathered status, eliminate, or severely restrict their usage depending on their mission use. • Continues development and certification of the DPP-1 container to improve safety, security, maintainability, and maintain content quality. • Recertifies container fleet every five years to ensure containers still meet regulations and requirements. • Continues to add new contents to existing container fleet. • Continue fabrication of needed DPP-2 to support phased transition of contents from the DT-22. • Commence fabrication of needed DPP-1 to	• Continues with development and certification of the DPP-3 container to improve safety, security, maintainability, and maintain content quality. • Completes development and certification of the DPP-1 container to improve safety, security, maintainability, and maintain content quality. • Recertifies container fleet every five years (or as necessary) to ensure containers still meet regulations and requirements. • Continues to add new contents to existing container fleet. • Complete fabrication of needed DPP-2 to support phased transition of contents from the DT-22. • Commence fabrication of needed DPP-1 to support phased transition of contents from the Model FL container. • Provides container refurbishment, reconditioning, and annual maintenance and certification to ensure containers are available for use to support weapons production, Life Extension Program (LEP), surveillance, and dismantlement activities. **FY 2017-FY 2020** • Continues to provide for shipping container research and development, design, certification, re-certification, test and evaluation, production and procurement, fielding and maintenance, decontamination and disposal. It also provides for off-site transportation authorization of shipping containers for nuclear materials and components supporting the nuclear security enterprise.	• Packaging (formerly named Containers) is now funded in the new Safety Operations subprogram within the Infrastructure and Safety program. The slight increase reflects development and certification completion of the DPP-1. • Maintains the packaging program to support the nuclear weapons program and the nuclear materials consolidation.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
support phased transition of contents from the Model FL container. • Provides container refurbishment, reconditioning, and annual maintenance and certification to ensure containers are available for use to support weapons production, LEP, surveillance, and dismantlement activities.	• Complete development of new containers in response to changing regulations, which historically have been updated every 10-15 years, and were last updated in 2004. Updated regulations will put older containers in grandfathered status, eliminate, or severely restrict their usage depending on their mission use. • Completes development and certification of the DPP-3 container to improve safety, security, maintainability, and maintain content quality. • Research and Development on the ES 4100 to correct design deficiencies identified during testing • Recertifies container fleet every five years to ensure containers still meet regulations and requirements and continues to add new contents to existing container fleet. • Complete fabrication of needed DPP-3 to support phased transition of contents from the DT-20 and DT-23. • Complete fabrication of needed DPP-1 to support phased transition of contents from the Model FL container. • Provides container refurbishment, reconditioning, and annual maintenance and certification to ensure containers are available for use to support weapons production, LEP, surveillance, and dismantlement activities. • Provides disposal of non-compliant containers and containers that are replaced by new designed containers.	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Criticality Safety Program $18,241,000	**Nuclear Criticality Safety Program $23,785,000**	**Nuclear Criticality Safety Program +$5,544,000**
• The Nuclear Criticality Safety Program (NCSP) activities were formerly in the Readiness in Technical Base and Facilities (RTBF) Program Readiness subprogram and have been moved to the Infrastructure and Safety program starting in FY 2016. • Provides for experimental capabilities including: the DOE Nuclear Criticality Safety Program's (NCSP) National Criticality Experiments Research Center (NCERC); large scale underground sub-critical plutonium experiments; high hazard, scientific experiments with special nuclear materials (e.g., dynamic plutonium experiments); and large high explosive charge experiments and testing.	• Provides technical infrastructure, expertise and experimentation capabilities for the DOE encompassing the following technical elements: Nuclear Data, Analytical Methods, Training & Education, Information Preservation and Dissemination, and Integral Experiments that includes the DOE Nuclear Criticality Safety Program's NCERC to ensure that criticality safety capabilities are adequate for the DOE mission. **FY 2017-FY 2020** • Provides technical infrastructure, expertise and experimentation capabilities for the DOE encompassing the following technical elements: Nuclear Data, Analytical Methods, Training & Education, Information Preservation and Dissemination, and Integral Experiments that includes the DOE Nuclear Criticality Safety Program's NCERC to ensure that criticality safety capabilities are adequate for the DOE mission in accordance with the NCSP Ten Year Mission and Vision (2014-2023).	• Nuclear Criticality Safety Program is now funded in the new Safety Operations subprogram within the Infrastructure and Safety program. • The increase reconstitutes the integral experiments component for all Nuclear Criticality Safety Program sponsored work at the NCERC.
Nuclear Safety Research and Development $0	**Nuclear Safety Research and Development $4,000,000**	**Nuclear Safety Research and Development +$4,000,000**
• The Nuclear Safety Research and Development (NSR&D) activities were formerly in the Readiness in Technical Base and Facilities (RTBF) Program Readiness subprogram and have been moved to the Infrastructure and Safety program starting in FY 2016.	• The NSR&D activities provide the technical foundation for safety analyses and controls as well as authorization basis decision making for DOE/NNSA nuclear facilities and associated operations. **FY 2017-FY 2020** • Provide funds for continued Nuclear Safety R&D activities for improved safety and efficiency in the operations of defense nuclear facilities within	• Increase restores the Nuclear Safety Research and Development activities.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	their approved safety bases.	
Environmental Projects and Operations **$48,700,000**	**Long Term Stewardship** **$52,215,000**	**Long Term Stewardship** **+$3,515,000**
• The Environmental Projects and Operations request was formerly in the Site Stewardship program and has been moved to the Infrastructure and Safety program starting in FY 2016. • Continue Long Term Stewardship activities at five sites: KCP, LLNL Main Site, LLNL Site 300, Pantex Plant, and Sandia National Laboratories to maintain compliance with all Federal and state regulations. • KCP funding supports corrective action required in the KCP Resource Conservation and Recovery Act permit for the Bannister Federal Complex including polychlorinated biphenyl (PCB) Fate and Transport Study as well as continuing to treat contaminated ground water; installing a replacement treatment system; performing monitoring of surface and ground water, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements. • LLNL Main Site and Site 300 funding is to continue treating contaminated ground water; performing monitoring of ground water; operating and maintaining landfill remedies, Five Year Review at 850/Pit 7 Complex (Operable Unit 5) at Site 300, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup	• Funds Long Term Stewardship (LTS) activities at four NNSA sites to operate and maintain environmental remedial systems, perform monitoring and analysis of environmental media to ensure compliance with federal and state requirements, re-evaluate activities for consistency with regulatory revisions and technology, and works with the federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner. • KCP meets regulatory requirements by continuing to treat contaminated ground water, performing monitoring of surface and ground water, and complete the installation of a replacement treatment system. It also provides for corrective action required in the KCP Resource Conservation and Recovery Act permit for the Bannister Federal Complex, including a qualitative risk assessment, field work and environmental assessment activities, analyses and reports. • LLNL Main Site and Site 300 meet regulatory requirements by continuing to treat contaminated ground water; performing monitoring of ground water; operating and maintaining landfill remedies; Five Year Review of the General Services Area, implement Institutional Controls agreement with offsite landowner, and new injections wells for effluent reinjection at Site 300; and enhanced source area remediation tests at Main Site.	• Long Term Stewardship (formerly Environmental Projects and Operations) is now funded in the new Safety and Operations subprogram within the Infrastructure and Safety program. • Increase reflects restoration of Long-term Stewardship to meet regulatory requirements.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
and reporting requirements. • Pantex Plant funding is to continue treating contaminated ground water including implementing the expansion of the treatment system at the Zone 11 perched ground water to meet the requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); performing monitoring of ground water; operating and maintaining landfill remedies, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements. • SNL funding is to continue environmental monitoring of surface water, ground water, and soils; operating and maintaining landfill remedies, and working with Federal and state regulatory agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements.	• Pantex meets regulatory requirements by continuing to treat contaminated ground water via pump and treat in-situ bioremediation systems. It also supports performing monitoring of ground water, and operating and maintaining landfill remedies. • SNL meets regulatory requirements by continuing to support environmental monitoring of surface water, ground water, and soil. It also provides for operating and maintaining landfill remedies. **FY 2017-FY 2020** • Responsible for continued LTS activities at NNSA sites: KCP, LLNL Main Site, LLNL Site 300, Pantex Plant, and SNL to maintain compliance with all federal and state regulations. • Perform Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) 5-year remedy reviews of selected cleanup remedies at Pantex, LLNL Main Site, LLNL Site 300, and SNL. • Support corrective action required in the KCP Resource Conservation and Recovery Act permit for the Bannister Federal Complex. • Meet LTS regulatory requirements by continuing to treat contaminated ground water; performing environmental monitoring of surface water, ground water, and soils; operating and maintenance of landfill remedies, and working with Environmental Protection Agency (EPA) regions and various states to meet post-completion regulatory cleanup and reporting requirements. • Continue working in concert with other federal agencies, states, and affected stakeholders to	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	execute LTS activities in a cost-effective, compliant, and safe manner consistent with end states that support the nuclear enterprise mission.	

Infrastructure and Safety
Maintenance
(Formerly part of Readiness in Technical Base Facilities)

Description

The Maintenance subprogram provides direct funded maintenance activities across the NNSA enterprise to support the recurring day-to-day work that is required to sustain and preserve NNSA facilities and equipment in a condition suitable for their designated use. These efforts include predictive, preventive, and corrective maintenance activities to maintain property, assets, systems, roads, and equipment and the required maintenance and surveillance of vital safety systems.

This subprogram deploys management systems to implement enterprise-wide, risk-informed investments in existing infrastructure. Maintenance prioritization will be based on mission needs, probability of failure of a system or a component and risk determination with regard to safety, security and environmental requirements. The investment strategy is to focus on those structures, systems, and components that are considered essential to the national security mission.

This subprogram also funds the roof maintenance portion of the Roof Asset Management Program (RAMP). In FY2016, the RAMP methodology will be used for enterprise wide Asset Management Programs for the strategic, cost effective enterprise-wide procurement of common equipment such as chillers and lighting. RAMP provides a dedicated approach to managing roofing assets through a single prioritized list of roofing needs across the nuclear security enterprise. The benefits of this approach enable the implementation of standard industry processes and best practices in the management of the roofing portfolio at a corporate level. Efficiencies are achieved by centralized procurement through leveraged buying power and long term solutions instead of short term repairs.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Maintenance and Repair of Facilities **$227,000,000**	**Maintenance** **$227,000,000**	**Maintenance** **$0**
• Maintenance activities are funded in the Maintenance and Repair of Facilities subprogram under the Readiness in Technical Base and Facilities in FY2015. • Funds the direct maintenance activities at NNSA sites across the nuclear security enterprise. These costs include labor materials and supplies for corrective, preventive and predictive maintenance activities. It also pays for completing prioritized annual surveillances and preventive maintenance of the vital systems, structures, and components at existing facilities. This program also funds priority roof replacement projects under Roof Asset Management Program (RAMP). • In addition: o At KCP, funds maintenance of process equipment and tenant improvement equipment, and Bannister Road surveillance and maintenance. o At Pantex, funds Bays and Cell maintenance, emerging requirements, and common site support. o At SNL, funds space charge share to support maintenance activities. o At SRS, funds maintenance on tritium facilities and associated equipment and activities associated with gas transfer systems. o At Y-12, funds repairs of identified structural deficiencies in mission essential facilities, fire system surveillances and repairs. o At LANL, funds maintenance activities at PF-4,	• Continues to fund the direct maintenance activities at the NNSA sites across the nuclear security enterprise. These costs include labor materials and supplies for corrective, preventive and predictive maintenance activities. It also pays for completing prioritized annual surveillances and preventive maintenance of the vital systems, structures, and components at existing facilities. This program also funds Asset Management Program activities including RAMP. • Specifically, o At KCP, funds maintenance of equipment and tenant improvement equipment, and Bannister Road surveillance and maintenance. o At Pantex, funds Bays and Cell maintenance, emerging requirements, and common site support. o At SNL, funds space charge share to support maintenance activities. o At SRS, funds maintenance on tritium facilities and associated equipment and activities associated with gas transfer systems. o At Y-12, funds repairs of identified structural deficiencies in mission essential facilities, fire system surveillances and repairs. o At LANL, funds maintenance activities at PF-4, CMR, DARHT, LANSCE, Beryllium, waste management, radiological laboratory, and tritium facilities. o At NNSS, funds maintenance of JASPER BEEF,	• Maintenance activities are now funded in the new Infrastructure and Safety program. No change to the program. • Aging infrastructure is leading to rising costs for preventive and more frequent corrective maintenance and repair to preserve facilities and equipment in a suitable condition for their designated use.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Chemistry and Metallurgical Research Facility (CMR), Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT), Los Alamos Neutron Science Center (LANSCE), Beryllium, waste management, radiological laboratory, and tritium facilities o At NNSS, funds maintenance of Joint Actinide Shock Physics Experimental Research (JASPER), Big Explosives Experimental Facility (BEEF), Device Assembly Facility (DAF), U1a. o At LLNL, funds maintenance activities at Contained Firing Facility, Superblock, High Explosive Application Facility (HEAF), High Explosive (HE) machine shops, NIF and waste management facilities.	DAF, and U1a. o At LLNL, funds maintenance activities at Contained Firing Facility, Superblock, HEAF, HE machine shops, and waste management facilities. **FY 2017-FY 2020** • In the outyears, funding will continue to support the direct maintenance activities at NNSA sites across the nuclear security enterprise, which includes costs for labor, materials, and supplies for corrective, preventive and predictive maintenance activities. It also includes costs to conduct required surveillances on vital safety systems, and building support systems. These costs include completing prioritized annual surveillances and preventative maintenance of the vital systems, structures, and components at existing facilities.	

Infrastructure and Safety
Recapitalization
(Formerly part of Readiness in Technical Base and Facilities)

Description

The Recapitalization subprogram is the key to arresting the declining state of NNSA infrastructure. A dedicated recapitalization investment is needed to overcome the current numerous obsolete support and safety systems and to revitalize facilities that are well beyond their end of life. The Recapitalization program provides for the modernization of NNSA infrastructure by prioritizing investments to improve the condition and extend the design life of the structures, capabilities or systems. These activities include upgrading aging NNSA infrastructure and improving the safety and quality of the workplace for NNSA's talented and dedicated workforce. Recapitalization also improves the reliability, sustainability and efficiency of NNSA's core infrastructure to reduce overall operating costs. Recapitalization enables NNSA to reduce the safety, security, environmental and program risks posed by the aging infrastructure.

The Recapitalization subprogram includes costs for minor construction projects, Capital Equipment projects, repair and replacement projects, and Other Project Costs (OPC) for Infrastructure and Safety construction projects. Recapitalization funds are also used to deactivate and dispose of infrastructure that is no longer needed thus reducing surveillance and maintenance costs of obsolete facilities and significantly lowering risks to worker, the public, the environment, and program objectives.

This subprogram also funds the Recapitalization portion (e.g. roof betterments) of the Roof Asset Management Program (RAMP). In FY2016, the RAMP methodology will be used for enterprise wide Asset Management Programs for the strategic, cost effective enterprise-wide procurement of common equipment such as chillers and lighting. In support of sustainability and energy performance goals, recapitalization projects will include energy conservation measures to the greatest extent practicable.

Given the increasing costs and unexpected failures associated with maintaining an aging and obsolete infrastructure, the Recapitalization program requires flexibility to change the priority of planned projects and activities. Table 1 is provided to present the current projected project plan for FY 2016 based on the status of enterprise infrastructure as of December 2014. This plan may need to be updated based on FY 2015 results and unplanned needs that arise between now and the FY 2016 execution year.

Recapitalization does not include line item construction projects, but does include OPC for construction projects executed as part of the Infrastructure and Safety program.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Recapitalization $168,800,000	**Recapitalization $257,724,000**	**Recapitalization +$88,924,000**
• Recapitalization activities are funded in the Recapitalization subprogram under the Readiness in Technical Base and Facilities Program in FY 2015. • Provide urgent improvements to facilities and work spaces and improve safety, reliability and working conditions. • Funds prioritized investments in obsolete/aging facilities and infrastructure to include DAF fire suppression system and electrical system upgrades at Nevada; Facility Risk Reduction implementation in enriched uranium (EU) and non-EU facilities at Y-12; High Pressure Fire Loop lead-in/Flame Detection/Radiation Alarm system at PX; Chiller and boiler replacements, HVAC upgrades at various sites. It also funds Other Project Costs associated with Line Item Construction, such as Emergency Operations Center, Y-12, Substation Replacement at TA-3, LANL and Fire Station, Y-12.	• Provides funds for needed investments in obsolete/aging facilities and infrastructure to improve safety, reliability and working conditions. • Table 1 contains the current FY 2016 project plan as of December 2014. Recapitalization funds are allocated in accordance with planned priorities but retain the flexibility to adjust efforts to address emerging changes in priorities and unplanned failures. **FY 2017-FY 2020** • Continues to provide highest priority improvements to facilities and improve safety, reliability and working conditions. • Provides funds for needed investments in obsolete/aging facilities and infrastructure to improve its condition.	• Recapitalizations activities are now funded in the new Infrastructure and Safety program. • The increase in the Recapitalization request supports an increased focus on infrastructure investments to modernize aging infrastructure and for additional safety-related recapitalization to arrest the declining state of the infrastructure. • Recapitalization funds are allocated in accordance with planned priorities but retain the flexibility to adjust efforts to address emerging changes in priorities and unplanned failures. Table 1 is provided as a list of planned FY 2016 projects.

Site	Planned Projects	FY 2016 Projected Funds (in thousands)
Kansas City Plant	Bannister Road Disposition	$28,000
	Bannister Road Site Surveillance before transfer	$7,800
	Facility Modifications for Weapons Production	$8,000
	Facility Capital Equipment	$8,000
Lawrence Livermore National Laboratory	Replace Mission Critical Heating Ventilation and Air Conditioning (HVAC) Systems	$9,800
	High Explosive (HE) Synthesis Pilot Plant Renovation	$2,500
Los Alamos National Laboratory	Dynamic Equation of State Facility Modernization	$6,500
	TA-55-Seismic Reinforcement	$5,250
	CMR Initial Facility Closure	$2,700
	TA-55 Criticality Safety equipment and infrastructure	$5,000
	Area G Solid Waste Safety Basis Implementation	$500
	HE Facilities Compliance and Modernization Upgrades	$700
	Collection Vault Alarms Leak Detection Upgrade	$500
	TA-55 Facility Control System Modifications	$500
Nevada National Security Site	Replace Device Assembly Facility (DAF) Lead In Lines	$12,300
	U1a Fire Protection Installation	$3,500
	Hill 200 Electrical Power Line Upgrade	$2,000
	Critical Site Infrastructure - Roads, Equipment, Structures Replacements, Roofs, HVAC	$1,000
	Upgrade DAF electric and backup power	$6,200
Pantex Plant	Bay & Cell Safety Improvement	$26,800
	General Workplace Improvements	$2,000
	Roof Betterments	$2,400
	Replace HVAC Systems	$3,000
	Replacement of Catenary Poles	$1,000
	Lightning Protection System Refurbishments	$10,700
	Gas Lab Replacement	$5,000
	Electrical/Mechanical Upgrades	$5,000
	Seismic Improvements	$1,700
	Secondary Feed	$1,300
	Fire Alarm Control Plane Phase I	$3,000
Sandia National Laboratories	Power Supply Sustainment	$1,500
	Neutron Generator Production Refurbishments	$6,000
	Standby Power Plant Upgrades	$3,000
	Primary Standards Lab Refurbishments	$500
	Seismic Upgrades	$500

Site	Planned Projects	FY 2016 Projected Funds (in thousands)
Savannah River Site	Replace Obsolete Oxygen Monitors	$2,940
	Reservoir Storage Vault Relocation	$2,600
	General Workplace Improvements	$500
	Air Handling Units Replacement	$2,060
	Air Monitoring Control	$100
Y-12 National Security Complex	50-Year Sprinkler Head Replacement	$4,000
	Annual RAMP Support	$1,000
	Ceiling Concrete Mitigation	$3,000
	Utility and Power Pole Replacement	$2,000
	Building 9204-2 Kathabar Replacement	$6,000
	161 KV Power Distribution System Transition	$5,500
Various	Planning, Assessments and Infrastructure Management Tools	$34,374
	High Risk Facility Disposition	$5,000
	Other Project Costs for Line Item Construction	$4,500
Total		$257,724

Infrastructure and Safety
Construction
(Formerly part of Readiness in Technical Base and Facilities)

Description

The Infrastructure and Safety Construction projects play a critical role in revitalizing the nuclear security enterprise including base infrastructure. Construction investments will replace obsolete and unreliable facilities and infrastructure to reduce safety and program risk, as well as improve the responsiveness and/or utility of the infrastructure and its technology base. The subprogram is focused on two primary objectives: (1) identification, planning, and prioritization of the projects supporting national security objectives, particularly the weapons programs, and (2) development and execution of these projects within approved cost and schedule baselines.

The funding request for FY 2016 continues the design and starts the construction of an Emergency Operations Center at Y-12. The increased request reflects the start of one new project: Substation Replacement at TA-3, LANL.

The Substation Replacement at TA-3 project at LANL will modernize the substation and components and improve reliability, reduce maintenance, and support greater operational flexibility at the laboratory. The project will provide reliable and efficient electrical distribution systems with sufficient electrical capacity to support the national security missions. The electrical distribution systems and infrastructures were built over 50 years ago. As a result, the systems are at capacity and have substantial distribution imbalances based on the power demands from mission growth over the many years of operations and will not meet the laboratory's near-term demands for power.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Construction $2,000,000	**Construction $42,919,000**	**Construction +$40,919,000**
• Infrastructure and Safety Construction projects are funded in the Readiness in Technical Base and Facilities program in FY 2015. • Start design of Emergency Operations Center (EOC) activities at Y-12.	• Continue design and start construction activities in the first quarter of FY 2017 for the EOC at Y-12. • Start design and construction activities for Substation Replacement at TA-3, LANL. **FY 2017-FY 2020** • In FY 2017 complete design and construction funding for the following projects: 1. EOC at LLNL, 2. Expand Electrical Distribution System at LLNL, and 3. Fire Station at Y-12 • Also in FY 2017, start design and construction activities for Electrical Improvements for Nuclear Operations (EINO), Y-12. • In FY 2018 complete design and construction funding for the EOC at SNL and continue design and construction for EINO, Y-12. • In FY 2019 added design funding for the following two new Line Item projects: 1. New 138K Power Transmission Event Corridor at NNSS and 2. Zone 11 High Pressure Fire Loop at Pantex. Also funds construction for EINO, Y-12.	• Infrastructure and Safety Construction projects are now in the new Infrastructure and Safety Program. The increase results from starting the design and construction of the Substation Replacement at TA-3 at LANL and for the completion of design and start of construction for the EOC at Y-12.

Infrastructure and Safety Program Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Operations of Facilities – Enable NNSA missions by providing operational facilities to support nuclear weapon dismantlement, life extension, surveillance, and research and development activities, as measured by percent of scheduled versus planned days mission-critical and mission-dependent facilities are available without missing key deliverables.							
Target	N/A	N/A	85% of availability	85% of availability	85% of availability	85% of availability	85% of availability
Result							
Endpoint Target	Mission critical facilities are available at least 85% of scheduled days annually.						
	Note: The Operations of Facilities section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. The Operations of Facilities performance measure target has been reduced from 95% to 85% because of budget reductions.						
Maintenance– Annual ratio of preventive maintenance (PM) versus corrective maintenance (CM) conducted with respect to total facility maintenance.							
Target	N/A	N/A	0.40	0.42	0.44	0.46	0.48
Result							
Endpoint Target	PM to CM ratio target is 0.50.						
	Note: The Maintenance section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. A performance measure for preventative maintenance will allow the Department to appropriately assess the status of the enterprise infrastructure and to track the level of maintenance being conducted.						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Recapitalization – Annual percentage of NNSA facilities rated adequate.							
Target	N/A	N/A	57%	58%	59%	60%	61%
Result							
Endpoint Target	65% of NNSA facilities rated as adequate.						

Note: A portion of the Recapitalization section of the Readiness in Technical Base and Facilities (RTBF) program has been moved to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. The 65% goal for execution of recapitalization projects within approved costs and schedules ensures timely and efficient implementation of long term modernization and corrective solutions.

Environmental Monitoring and Remediation - Annual percentage of environmental monitoring and remediation deliverables that are required by regulatory agreements to be conducted at NNSA sites under Long Term Stewardship (LTS) that are executed on schedule and in compliance with all acceptance criteria.							
Target	N/A	N/A	95% of deliverables	95% of deliverables	95% of deliverables	95% of deliverables	95% of deliverables
Result							
Endpoint Target	Annually, submit on schedule and receive regulatory approval of at least 95% of all environmental monitoring and remediation deliverables that are required at NNSA sites under LTS by regulatory agreements.						

Note: The Environmental Projects and Operations (EPO) section has been moved from the Site Stewardship program to the Infrastructure and Safety program, a new Government Performance and Reporting Act (GRPA) unit starting in FY 2016. EPO is renamed Long Term Stewardship.

Infrastructure and Safety
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	0	0	0	0	0	49,356	+49,356
Plant Projects (GPP) (<$10M)	159,968	11,348	4,750	4,690	33,700	59,560	+25,860
Total, Capital Operating Expenses	**159,968**	**11,348**	**4,750**	**4,690**	**33,700**	**108,916**	**+75,216**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0	0	49,356	+49,356
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**	**0**	**49,356**	**+49,356**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0	0	0	0
Facility Modifications for Weapons Production, KCP	8,000	0	0	0	0	8,000	+8,000
LANSCE 201 MHz Radio Frequency Replacement	19,848	11,348	0	0	8,500	0	-8,500
Gas Lab Replacement, PX	9,800	0	0	0	0	5,000	+5,000
Bldg. 12-126 Electrical/Mechanical Upgrades, PX	9,800	0	0	0	500	5,000	+4,500
Bldg. 12-75 Electrical/Mechanical Upgrades, PX	9,200				9,200	0	-9,200
Device Assembly Facility (DAF) Electrical & Control Systems, NNSS	9,200	0	0	0	1,000	6,200	+5,200
Replace 138kV Power Transmission Line at Hill 200, NNSS	8,600	0	0	0	1,500	2,000	+500
Reservoir Storage, SRS	8,500	0	0	0	0	2,600	+2,600
Replace 234-7H Air Handling Unit, SRS	8,650	0	4,390	4,390	2,200	2,060	-140
161 KV Power Distribution System, Y-12	6,500	0	0	0	1,000	5,500	+4,500
Bld 92-2 Kathabar Replacement, Y-12	9,000	0	0	0	3,000	6,000	+3,000
Dynamic Equation of State Facility, LANL	6,500	0	0	0		6,500	+6,500
HE Facilities Compliance Modernization, LANL	6,770	0	0	0	0	700	+700
C914 Seismic Upgrades, SNL	9,000	0	0	0	0	500	+500

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
ABQ: Bldg. 870 Neutron Generator Production Facility - Refurbishments, SNL	6,500	0	0	0	500	6,000	+5,500
TTR: Bldg. 03-57 Utility Tower Addition, SNL	6,600	0	360	300	6,300	0	-6,300
ABQ: Bldg. 827 Weapons Primary Standards Laboratory - Refurbishments, SNL	9,000	0	0	0	0	500	+500
ABQ: Bldg. 862 Standby Power Plant - System Upgrade, SNL	8,500	0	0	0	0	3,000	+3,000
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**159,968**	**11,348**	**4,750**	**4,690**	**33,700**	**59,560**	**+25,860**
Total, Capital Summary	**159,968**	**11,348**	**4,750**	**4,690**	**33,700**	**108,916**	**+75,216**

Outyears for Infrastructure and Safety
(Comparable)

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	50,442	51,552	52,686	53,845
Plant Projects (GPP) (<$10M)	69,493	31,369	25,927	26,497
Total, Capital Operating Expenses	**119,935**	**82,921**	**78,613**	**80,342**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	50,442	51,552	52,686	53,845
Total Non-MIE Capital Equipment (>$500K)	**50,442**	**51,552**	**52,686**	**53,845**
Total, Capital Equipment (including MIE)	**50,442**	**51,552**	**52,686**	**53,845**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	24,823	25,369	25,927	26,497
Facility Modifications for Weapons Production, KCP	0	0	0	0
LANSE 201 MHz Radio Frequency Replacement, LANL	0	0	0	0
Gas Lab Replacement, PX	4,800	0	0	0
Bld 12-126 Electrical/Mechanical Upgrades, PX	4,300	0	0	0
Bld 12-75 Electrical/Mechanical Upgrades, PX	0	0	0	0
Device Assembly Facility (DAF) Electrical & Control Systems, NNSS	2,000	0	0	0
Replace 138kV Power Transmission Line at Hill 200, NNSS	5,100	0	0	0
Reservoir Storage, SRS	5,900	0	0	0
Replace 234-7H Air Handling Units (AHU)	0	0	0	0
161 KV Power Distribution System, Y-12	0	0	0	0
Bld 92-2 Kathabar Replacement, Y-12	0	0	0	0
Dynamic Equation of State Facility, LANL	0	0	0	0
HE Facilities Compliance Modernization, LANL	6,070	0	0	0
C914 Seismic Upgrades, SNL	5,500	3,000	0	0
ABQ: Bldg. 870 Neutron Generator Production Facility-Refurbishments, SNL	0	0	0	0
TTR: Bldg. 03-57 Utility Tower Addition, SNL	0	0	0	0
ABQ: Bldg. 827 Weapons Primary Standards Laboratory - Refurbishments	5,500	3,000	0	0
ABQ: Bldg. 862 Standby Power Plant - System	5,500	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**69,493**	**31,369**	**25,927**	**26,497**
Total, Capital Summary	**119,935**	**82,921**	**78,613**	**80,342**

Construction Projects Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Request	FY 2016 Request	FY 2016 vs FY 2015
17-D-xxx, Electrical Improvements for Nuclear Operations, Y-12							
Total Estimated Cost (TEC)	TBD	0	0	0	0	0	0
Other Project Cost (OPC)	TBD	0	0	0	2,000	2,000	0
TPC, 17-D-xxx, Electrical Improvements for Nuclear Operations, Y-12	**0**	**0**	**0**	**0**	**2,000**	**2,000**	**0**
17-D-xxx, Electrical Infrastructure Upgrades, LLNL							
TEC	TBD	0	0	0	0	0	0
OPC	TBD	1,000	0	0	400	0	-400
TPC, 17-D-xxx, Electrical Infrastructure Upgrades, LLNL	**0**	**1,000**	**0**	**0**	**400**	**0**	**-400**
17-D-xxx, Fire Station, Y-12							
TEC	20,000	0	0	0	0	0	0
OPC	5,000	0	0	0	1,000	1,000	0
TPC, 17-D-xxx, Fire Station, Y-12	**25,000**	**0**	**0**	**0**	**1,000**	**1,000**	**0**
16-D-621, Substation Replacement at TA-3, LANL							
TEC	25,000	0	0	0	0	25,000	+25,000
OPC	3,200	873	0	0	600	400	-200
TPC, 16-D-621, Substation Replacement at TA-3, LANL	**28,200**	**873**	**0**	**0**	**600**	**25,400**	**+24,800**
15-D-613, Emergency Operatons Center, Y-12							
TEC	20,000	0	0	0	2,000	17,919	+15,919
OPC	3,350	0	1,300	1,300	450	250	-200
TPC, 15-D-613, Emergency Operatons Center, Y-12	**23,350**	**0**	**1,300**	**1,300**	**2,450**	**18,169**	**+15,719**

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Request	FY 2016 Request	FY 2016 vs FY 2015
15-D-612, Emergency Operatons Center, LLNL							
TEC	20,000	0	0	0	0	0	0
OPC	2,500	237	155	155	108	500	+392
TPC, 15-D-612, Emergency Operatons Center, LLNL	**22,500**	**237**	**155**	**155**	**108**	**500**	**+392**
15-D-611, Emergency Operatons Center, SNL							
TEC	40,000	0	0	0	0	0	0
OPC	3,000	0	700	700	200	200	0
TPC, 15-D-611, Emergency Operatons Center, SNL	**43,000**	**0**	**700**	**700**	**200**	**200**	**0**
Total All Construction Projects							
TEC	125,000	0	0	0	2,000	42,919	+2,000
OPC	17,050	2,110	2,155	2,155	4,758	4,350	0
TPC All Construction Projects	**142,050**	**2,110**	**2,155**	**2,155**	**6,758**	**47,269**	**+40,511**

Outyears to Completion for Infrastructure and Safety

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
19-D-XXX, Zone 11 High Pressure Fire Loop, PX					
TEC	0	0	10,000	12,000	TBD
OPC					TBD
TPC, 19-D-XXX, Zone 11 High Pressure Fire Loop, PX	0	0	10,000	12,000	0
19-D-XXX, New 138K Power Transmission Event Corridor, NNSS					
TEC	0	0	15,000	30,000	TBD
OPC					TBD
TPC, 19-D-XXX, New 138K Power Transmission Event Corridor, NNSS	0	0	15,000	30,000	0
17-D-xxx, Electrical Improvements for Nuclear Operations, Y-12					
TEC	32,000	11,000	25,000	7,000	TBD
OPC	6,000	4,000	1,000	0	TBD
TPC, 17-D-xxx, Electrical Improvements for Nuclear Operations, Y-12	38,000	15,000	26,000	7,000	0
17-D-xxx, Electrical Infrastructure Upgrades, LLNL					
TEC	23,000	0	0	0	0
OPC	0	500	500	0	0
TPC, 17-D-xxx, Electrical Infrastructure Upgrades, LLNL	23,000	500	500	0	0
17-D-xxx, Fire Station, Y-12					
TEC	20,000	0	0	0	0
OPC	1,000	2,000	0	0	0
TPC, 17-D-xxx, Fire Station, Y-12	21,000	2,000	0	0	0

	(Dollars in Thousands)				
	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
16-D-621, Substation Replacement at TA-3, LANL					
TEC	0	0	0	0	0
OPC	300	500	527	0	0
TPC, 16-D-621, Substation Replacement at TA-3, LANL	300	500	527	0	0
15-D-613, Emergency Operations Center, Y-12					
TEC	0	0	0	0	0
OPC	500	500	200	150	0
TPC, 15-D-613, Emergency Operations Center, Y-12	500	500	200	150	0
15-D-612, Emergency Operations Center, LLNL					
TEC	20,000	0	0	0	0
OPC	500	500	500	0	0
TPC, 15-D-612, Emergency Operations Center, LLNL	20,500	500	500	0	0
15-D-611, Emergency Operations Center, SNL					
TEC	0	40,000	0	0	0
OPC	200	200	1,500	0	0
TPC, 15-D-611, Emergency Operations Center, SNL	200	40,200	1,500	0	0
Total All Construction Projects					
TEC	95,000	51,000	50,000	49,000	0
OPC	8,500	8,200	4,227	150	0
Total Project Cost (TPC) All Construction Projects	103,500	59,200	54,227	49,150	0

16-D-621, Substation Replacement at TA-3
Los Alamos National Laboratory, Los Alamos, New Mexico
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes
This Construction Project Data Sheet (CPDS) is new and does include a new start for the budget year.

Summary
The most recent DOE O 413.3B approved Critical Decision (CD) is CD-1 for both the LANL and Lawrence Livermore National Laboratory (LLNL) projects, approved on February 10, 2012, with a preliminary cost range of $33,400 to $55,400 and CD-4 of 4Q FY 2016. The preliminary cost range for the LANL scope only is $17,000 to $28,200.

A Federal Project Director had been assigned to this project but a replacement Federal Project Director is in the process of being assigned.

The project will design and construct a replacement Technical Area (TA)-3 substation at LANL. The new substation will be a larger, modern substation and components designed to provide increased distribution capacity, improved reliability, reduced maintenance, support for greater operational flexibility and increased worker safety that will provide separate power feeds to both the Laboratory and to Los Alamos County. The current plan is to use the FY 2016 funding to complete design and construction. The current acquisition approach is based on using a fixed price design/build contract.

2. Critical Milestone History[a]

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2016	08/31/11	02/10/2012	02/10/2012	1Q FY 2016	3Q FY 2016	2Q FY 2016	2Q FY 2019	4Q FY 2018

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History[b]

(dollars in thousands) [a]

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2016	3,000	22,000	25,000	3,200	NA[c]	3,200	28,200

[a] The schedules are only estimates and consistent with the high end of the schedule ranges.
[b] The numbers are only estimates and consistent with the high end of the cost ranges.
[c] The costs of the D&D are expected to be offset by the salvage value of the material being removed resulting in no cost impact to the project.

4. Project Scope and Justification

Scope

The project will design and construct a new electrical substation to replace the Technical Area (TA)-3 substation at LANL. The substation replacement is anticipated to increase the capacity from 66 MVA to 112 MVA (Megavolt Ampere) and provide separate power feeds to both the Laboratory and to Los Alamos County. The Project will demolish and dispose (D&D) the existing substation that is being replaced. The costs of the D&D are expected to be offset by the salvage value of the material being removed resulting in no cost impact to the project.

Justification

The Substation will provide reliable and efficient electrical distribution systems with sufficient electrical capacity to support the national security missions. The electrical distribution systems and infrastructures were built over 50 years ago. As a result, the systems are at capacity and have substantial distribution imbalances based on the power demands from mission growth over the many years of operations and struggle to meet the Laboratory's current demand for power. In addition, the Department is required to supply power to the Los Alamos County, where the power demand is steadily growing as well. If these systems are not upgraded and updated, then current development and progress will be hampered.

The increase in capacity is required to meet the 50 years of mission growth at LANL (i.e., high performance computing, core LANL functions, etc.). The need to provide electrical service to Los Alamos County is based on a signed agreement between the Department of Energy (DOE) and County. The separate feed to the County will reduce the life-cycle cost to DOE by transferring maintenance and operation to Los Alamos County.

The capability to safely and reliably distribute adequate electrical power is critical to the successful accomplishment of the LANL Stockpile Stewardship missions. This capability is considered key to the infrastructure needs of the site, and it must operate continuously without interruption. Consistent with the long-term mission requirement, this capability must have a minimum service life of 40 years to align its availability with planned strategic mission timeframes. In addition, this upgrade will provide the versatility to adapt to increasingly stringent safety, security, environmental regulations, and new technology. Inherent in this capability is the minimization (to the greatest extent possible) of environmental impacts and construction waste produced as a result of this upgrade.

More detailed risk analysis will be performed as the project transition to the final design and execution phases.

No construction funds will be used until the project performance baseline has been validated and CD-3 has been approved.

The project is being conducted in accordance with the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets.

5. Financial Schedule

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2016	N/A	N/A	2,500
FY 2017	N/A	N/A	500
Total, Design	N/A	N/A	3,000
Construction			
FY 2016	N/A	N/A	11,500
FY 2017	N/A	N/A	9,500
FY 2018	N/A	N/A	1,000
Total, Construction	N/A	N/A	22,000
TEC			
FY 2016	25,000	25,000	14,000
FY 2017	0	0	10,000
FY 2018	0	0	1,000
Total, TEC	25,000	25,000	25,000
Other Project Cost (OPC)			
OPC			
FY 2011	100	100	100
FY 2012	762	762	762
FY 2013	11	11	11
FY 2014	0	0	0
FY 2015	600	600	600
FY 2016	400	400	400
FY 2017	300	300	300
FY 2018	500	500	500
FY 2019	527	527	527
Total, OPC	3,200	3,200	3,200
Total Project Cost (TPC)			
FY 2011	100	100	100
FY 2012	762	762	762
FY 2013	11	11	11
FY 2014	0	0	0
FY 2015	600	600	600
FY 2016	25,400	25,400	14,400
FY 2017	300	300	10,300
FY 2018	500	500	1,500
FY 2019	527	527	527
Total, TPC	28,200	28,200	28,200

6. Details of Project Cost Estimate

	(dollars in thousands)		
	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	2,500		N/A
Contingency	500		N/A
Total, Design	3,000		N/A
Construction			
Site Work	500		N/A
Equipment	8,000		N/A
Construction	11,000		N/A
D&D	0		N/A
Contingency	2,500		N/A
Total, Construction	22,000		N/A
Total, TEC	25,000		N/A
Contingency, TEC	3,000		N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	450		N/A
Conceptual Design	500		N/A
Design Support	270		N/A
Other OPC Costs	500		N/A
Start-up	1,000		N/A
Contingency	980		N/A
Total, OPC except D&D	3,200		N/A
Total, OPC	3,200		N/A
Contingency, OPC	980		N/A
Total, TPC	28,200		N/A
Total, Contingency	3,980		N/A

7. Schedule of Appropriation Requests

Request		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Outyears	Total
FY 2016	TEC	0	0	25,000	0	0	0	0	0	25,000
	OPC	873	600	400	300	500	527	0	0	3,200
	TPC	873	600	25,400	300	500	527	0	0	28,200

8. Related Operations and Maintenance Funding Requirements

Start of Operation of Beneficial Occupancy (fiscal quarter or date)	4Q FY 2018
Expected Useful Life (number of years)	40
Expected Future Start of D&D of this capital asset (fiscal quarter)	1Q FY 2048

(Related Funding Requirements)[a]

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	100	N/A	4,000	N/A
Utilities	N/A	N/A	N/A	N/A
Maintenance & Repair	100	N/A	4,000	N/A
Total	200	N/A	8,000	N/A

9. Required D&D Information

The new area being constructed in this project is replacing existing facilities, and the costs of D&D of the facilities that are being replaced are expected to be offset by the salvage value of the material being removed resulting in no cost impact to the project.

	Square Feet
New area being constructed by this project at LANL……	1,200[b]
Area of D&D in this project at LANL……	700[c]
Area at LANL to be transferred, sold, and/or D&D outside the project including area previously "banked"……	500
Area of D&D in this project at other sites……..	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"……	0
Total area eliminated ……..……..	0

[a] This upgrade will increase the electrical systems capacity at the site. The maintenance and operations cost will not significantly increase over the current amounts because more efficient system will be installed. However, a life-cycle cost analysis will be performed during design to select the most cost-effective alternative. Upon completion of the alternative analysis, the costs for the operations and maintenance will be established.

[b] Area of building housing relay and protection equipment only.

[c] D&D of equipment and systems within the existing control and relay building.

Name/s and site location/s of existing facility/ies to be D&D by this project:

LANL; TA-3 substation control house; 700 sq ft

The existing and the new substations are fenced and graveled yard areas containing free standing high power equipment such as transformers, breakers, towers, and buss work. A 700 sq. ft. building housing relays and protection equipment will be removed at the existing substation. The new substation will contain a new building for the relays and protection equipment which will be approximately 1,200 sq. ft. in size.

10. Acquisition Approach

The upgrade may be managed by the Management and Operating (M&O) Contractor. A design-build option will be evaluated.

The existing TA-3 substation equipment is located in an approximate 46,000 sq. ft. fenced footprint and contains two transformers, oil filled breakers, a control house, and a vertical ring buss. The demolition of the existing substation at LANL will be managed by the M&O contractor and executed by private salvage companies that may need the materials.

15-D-613, Emergency Operations Center, Y-12
Y-12 National Security Complex, Oak Ridge, Tennessee
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update to the Fiscal Year (FY) 2015 CPDS and does not include a new start for the budget year. Critical Decision (CD) 2 has been delayed one year to align with a combined CD-3 execution strategy, and the Other Project Costs (OPC) have been increased by $850 to reflect the activity-based estimated cost for the CD-1 deliverables, which are greater than the previous, parametric estimate.

Summary

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, approved on July 26, 2012, had a preliminary cost range of $45,000 to $75,000 for three Emergency Operations Centers (EOC) at Y-12, Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL) and CD-4 date range of 2nd Quarter (Q) FY 2018 and 2Q FY 2020. The Total Estimate Cost (TEC) for this project is a rough order of magnitude (ROM) estimate of $20,000.

A Federal Project Director has been assigned to this project and has approved this CPDS.

The objective of the EOC project is to provide a facility that meets the requirements as driven by the DOE Order 151.1C. The preferred alternative for the project would provide a new facility that would provide all the order driven requirements to ensure continuous operation during an emergency event. The FY 2016 TEC funding is for full funding of the remaining TEC work.

2. Critical Milestone History[a]

	CD-0	Conceptual Design Complete	CD-1	CD-2	Design Complete	CD-3	D&D Complete	CD-4
FY 2015	07/26/2012		2Q FY 2015	1Q FY 2016	1Q FY 2017	2Q FY 2017	N/A	2Q FY 2020
FY 2016	07/26/2012	2Q FY 2015	2Q FY 2015	2Q FY 2017	1Q FY 2017	2Q FY 2017	N/A	2Q FY 2020

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

[a] The schedules are only estimates and consistent with the high end of the schedule ranges.

3. Project Cost History[a]

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	4,000	16,000	20,000	2,500	NA	2,500	22,500
FY 2016	4,000	16,000	20,000	3,350	NA	3,350	23,350

4. Project Scope and Justification

Scope

The final scope will be established at the time the project CD-2/3 is approved. During the conceptual design phase, feasible options have been evaluated to ensure the space need is correctly sized to meet the sites critical mission needs.

The project scope is to design and build an Emergency Operations Center at the Y-12 National Security Complex. The building is estimated to be 17,000 sq ft; single story; allow for a normal occupancy of 10 - 20 and up to 40 during an emergency event; provide 100 parking spaces; and contain or interface with approximately 60 systems including CCTV, Meteorology, Plant Fire Alarm, etc. Minimum capabilities based on DOE Order 151.1C, will be provided. The new building will be energy sustainable and will be designed with close consideration of Leadership in Energy and Environmental Design (LEED) Gold standards.

Justification

The current onsite facility is not compliant with DOE Order 151.1C "Comprehensive Emergency Management System." The order requires that emergency operations/response centers be capable of supporting continuous emergency operations for an extended period of time and survive various severe events, such as earthquakes and tornadoes. The existing facility has the following limitations:

- Using aging facilities with extremely limited workspace; facilities not designed to survive the high-consequence natural phenomena events such as earthquakes, tornadoes, or floods.
- Existing facilities are within the range of worst-case hazardous material releases analyzed in the preliminary hazard assessments and due to leak path factors, the facilities will not provide a significant barrier to hazardous material releases and not equipped with positive pressure filtration system, i.e. HEPA filtration for habitability.
- Lacks provision to sustain 24 hour operations for durations required by DOE Order 151.1C

The project is being conducted in accordance with the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets.

[a] The numbers are only estimates and consistent with the high end of the cost ranges.

5. Financial Schedule

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	N/A	N/A	1,500
FY 2016	N/A	N/A	2,000
FY 2017	N/A	N/A	500
Total, Design	N/A	N/A	4,000
Construction			
FY 2017	N/A	N/A	9,000
FY 2018	N/A	N/A	6,000
FY 2019	N/A	N/A	1,000
Total, Construction	N/A	N/A	16,000
TEC			
FY 2015	2,000	2,000	1,500
FY 2016	17,919	17,919	2,000
FY 2017	0	0	9,500
FY 2018	0	0	6,000
FY 2019	0	0	919
Total, TEC	19,919	19,919	19,919
Other Project Cost (OPC)			
OPC			
FY 2014	1,300	1,300	1,300
FY 2015	450	450	450
FY 2016	250	250	250
FY 2017	500	500	500
FY 2018	500	500	500
FY 2019	200	200	200
FY 2020	150	150	150
Total, OPC	3,350	3,350	3,350
Total Project Cost (TPC)			
FY 2014	1,300	1,300	1,300
FY 2015	2,450	2,450	1,950
FY 2016	18,169	18,169	2,250
FY 2017	500	500	10,000
FY 2018	500	500	6,500
FY 2019	200	200	1,119
FY 2020	150	150	150
Total, TPC	23, 269	23,269	23,269

6. Details of Project Cost Estimate

	(dollars in thousands)		
	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	3,300	3,300	NA
Contingency	700	700	NA
Total, Design	4,000	4,000	NA
Construction			
Site Work	500	500	NA
Equipment	500	500	NA
Construction	13,000	13,000	NA
Contingency	2,000	2,000	NA
Total, Construction	16,000	16,000	NA
Total, TEC	20,000	20,000	NA
Contingency, TEC	2,700	2,700	NA
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	1,350	250	NA
Conceptual Design	400	650	NA
Start-Up	600	600	NA
Other OPC Costs	500	500	NA
Contingency	500	500	NA
Total, OPC except D&D	3,350	2,500	NA
Total, OPC	3,350	2,500	NA
Contingency, OPC	500	500	NA
Total, TPC	23,350	22,500	NA
Total, Contingency	3,200	3,200	NA

7. Schedule of Appropriation Requests

($K)

Request		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Outyears	Total
FY 2015	TEC	0	2,000	2,000	16,000	0	0	0	0	20,000
	OPC	450	450	250	500	500	200	150	0	2,500
	TPC	450	2,450	2,250	16,500	500	200	150	0	22,500
FY 2016	TEC	0	2,000	17,919	0	0	0	0	0	19,919
	OPC	1,300	450	250	500	500	200	150	0	3,350
	TPC	1,300	2,450	18,169	500	500	200	150	0	23,269

8. Related Operations and Maintenance Funding Requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	2QFY 2020
Expected Useful Life (number of years)	30
Expected Future Start of D&D of this capital asset (fiscal quarter)	3QFY 2050

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	NA	NA	NA	NA
Utilities	NA	NA	NA	NA
Maintenance & Repair	NA	NA	NA	NA
Recapitalization	NA	NA	NA	NA
Total	NA	NA	NA	NA

9. D&D Information

The new area proposed to be constructed in this project would replace existing facilities; however, the costs of D&D of the facilities that would be replaced are not included in the costs of this construction project. The current EOC this project replaces occupies a small portion of the 9706-2 Building. Per the Master Plan for the Y-12 National Security Complex, Building 9706-2 is to be demolished in FY 2020. The project will utilize previously 1,092,697 sq. ft. of banked facilities at Y-12 to meet the one-for-one requirement.

	Square Feet
New area being constructed by this project at Y-12……	17,000
Area of D&D in this project at Y-12……	0
Area at Y-12 to be transferred, sold, and/or D&D outside the project including area previously "banked"……	17,000
Area of D&D in this project at other sites……..	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"…….	0
Total Area Eliminated:……	17,000

10. Acquisition Approach

Various alternatives are being considered with respect to this project. The alternatives being considered are Federal led or utilizing the current management and operating (M&O) contractor.

- Design-Bid-Build (design with option to build) contract execution strategy for the building construction
- Design-Procurement-Build subcontract for the specialty systems design, installation, and integration

Site forces for design and construction of building utilities and interfaces to the existing plat infrastructure.

Site Stewardship

Overview

The Site Stewardship Government Performance and Results Act (GPRA) unit goal is to ensure the overall health and viability of NNSA's nuclear security enterprise and bring focus on nuclear materials disposition and developing skills and talent to support NNSA's enduring technical workforce at the laboratories and production plants. Site Stewardship is comprised of Nuclear Materials Integration, and Minority Serving Institution Partnerships Program.

The Nuclear Materials Integration (NMI) program funds the stabilization, consolidation, packaging and disposition of nuclear materials. NMI also focuses on the operation and maintenance of the Nuclear Materials Management and Safeguards System (NMMSS) that tracks and accounts for nuclear materials at Department of Energy (DOE) and sites licensed by the Nuclear Regulatory Commission (NRC).

The Minority Serving Institution (MSI) Partnership program funds research and education enhancements at under-represented colleges and universities in order to increase the number of people with the needed skills and talent to support NNSA's enduring technical workforce at the labs and production plants.

Highlights of the FY 2016 Budget Request

The NMI program will continue to maintain and operate the Nuclear Materials Management and Safeguards System in partnership with the Nuclear Regulatory Commission. The NMI program will also fund stabilization, re-packaging, consolidation and disposition of NNSA inactive actinides and other nuclear materials. These activities will be performed at NNSA sites, as well as other DOE sites where NNSA legacy nuclear materials are stored. In FY 2016, the NMI program will fund Inactive Actinide activities at the Oak Ridge National Laboratory (ORNL), Los Alamos National Laboratory (LANL), and Y-12; maintain the technical support and cost analyses relating to the management of the Heavy Isotopes work at (ORNL); complete pre-receipt preparations, cask certification, and temporary storage of plutonium-bearing mixed oxide fuel at SNL prior to disposal; and process and disposition of SNL sodium bonded debris material at INL. The NMI program will also perform planning studies and analyses relating to the life-cycle management of nuclear materials.

The MSI Partnership Program will continue to pursue and cultivate partnerships, collaborations and consortiums that align with the research and resources conducted at NNSA/DOE national laboratories. This alignment is defined by the following goals: 1) strengthen and expand MSI capacity and research experience in DOE mission areas of interest; 2) increase visible participation of MSI faculty in DOE technical engagements and activities, such as collaborative research, technical workshops, expert panel reviews and studies, and competitive processes; 3) target collaborations between MSIs and DOE laboratories and plants that increase scientist-to-scientist interactions, applied research and engineering application collaborations and/or implementation of research results, and provide MSI access to DOE facilities; 4) increase the number of MSI students who graduate with Science, Technology, Engineering, and Math (STEM) degrees relevant to DOE mission areas and have had exposure to career opportunities at DOE; and 5) increase the number of minority graduates and post-doctoral students hired into DOE's technical and scientific workforce.

Major Outyear Priorities and Assumptions

Outyear funding levels for the Site Stewardship total $150,211,000 for FY 2017 through FY 2020.

The outyear funding will allow the NMI program to continue the stabilization, consolidation, packaging, and disposition of nuclear materials and to complete planning and continue recovery activities associated with Mk-18a targets in storage at Savannah River.

Out year funding will also allow MSI Partnership program to continue to provide resources at minority institutions to enhance research and education and to invest in workforce development at universities to support the development of skills and talent to support NNSA's enduring technical workforce at the laboratories and production plants.

Site Stewardship
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Site Stewardship					
Environmental Projects and Operations	51,001	50,791	48,700	0	-48,700
Nuclear Materials Integration	12,676	12,485	13,300	17,510	+4,210
Corporate Project Management	9,118	9,118	0	0	0
Minority Serving Institution Partnership Program	14,531	14,531	14,531	19,085	+4,554
Total, Site Stewardship	**87,326**	**86,925**	**76,531**	**36,595**	**-39,936**

Outyears for Site Stewardship
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Site Stewardship				
Environmental Projects and Operations	0	0	0	0
Nuclear Materials Integration	17,804	18,183	18,557	18,952
Corporate Project Management	0	0	0	0
Minority Serving Institution Partnership Program	18,956	18,832	19,144	19,443
Total, Site Stewardship	**36,760**	**37,015**	**37,701**	**38,395**

National Nuclear Security Administration Site Stewardship
Budget Structure Changes

In FY 2016, OMB Request proposes the Environmental Projects and Operations program be realigned under the Safety Operations subprogram within the Infrastructure and Safety GPRA unit.

FY 2016 Budget Structure

	NNSA Weapons Activities Infrastructure and Safety					
	Operations of Facilities	**Safety Operations**	**Maintenance**	**Recapitalization**	**Construction**	**Total**
FY 2015 Budget Structure						
Weapons Activities						
Site Stewardship						0
Environmental Projects & Operations	0	52,215	0	0	0	52,215
Nuclear Materials Integration	0	0	0	0	0	0
Minority Serving Institution Partnership Program	0	0	0	0	0	0
Total Weapons Activities	**0**	**52,215**	**0**	**0**	**0**	**52,215**

Site Stewardship
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Environmental Projects and Operations: The FY 2016 OMB Request proposes that this program be realigned under the Safety Operations subprogram within the Infrastructure and Safety GPRA unit.	**-48,700**
Nuclear Materials Integration: This increase will be directed at the continued removal of inactive actinides at Los Alamos National Laboratory, as well as support of nuclear material removal activities at Y-12, that were delayed from FY 2015 (i.e. Consolidation of Uranium Storage, Disposition of U-Zr and Low- Equity Highly Enriched Uranium); and to complete planning and continue recovery activities associated with Mk-18a targets in storage at Savannah River.	**+4,210**
Minority Serving Institution Partnerships Program: This increase will be utilized to effectively launch a refined Massie Chairs of Excellence Program beginning in FY 2016. This increase will also provide NNSA the ability to exclusively nurture each program under the MSI Partnership umbrella. This funding will give NNSA the ability to pursue over 15 grants in different STEM topical areas that are of interest to NNSA and DOE national laboratories. Support will be provided to Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs) and Hispanic Serving Institutions (HSIs).	**+4,554**
Total, Site Stewardship	**-39,936**

Description

The FY 2016 OMB Request proposes that this program be realigned under the Safety Operations subprogram within the Infrastructure and Safety GPRA unit.

FY 2017-FY 2020 Key Milestones

- Not applicable.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Environmental Projects and Operations $48,700,000	**Environmental Projects and Operations $0**	**Environmental Projects and Operations -$48,700,000**
• Continue LTS activities at five sites: KCP, LLNL Main Site, LLNL Site 300, Pantex Plant, and Sandia National Laboratories to maintain compliance with all Federal and state regulations. • KCP funding request of $4,432,000 is to support corrective action required in the KCP Resource Conservation and Recovery Act permit for the Bannister Federal Complex including PCB Fate and Transport Study as well as continuing to treat contaminated ground water; installing a replacement treatment system; performing monitoring of surface and ground water, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements. • LLNL Main Site and Site 300 funding request of $25,039,000 is to continue to treat contaminated ground water; performing monitoring of ground water; operating and maintaining landfill remedies, Five Year Review at 850/Pit 7 Complex (Operable Unit 5) at Site 300, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements.	• The FY 2016 OMB Request proposes that this program be realigned under the Safety Operations subprogram within the Infrastructure and Safety GPRA unit.	• The FY 2016 OMB Request proposes that this program be realigned under the Safety Operations subprogram within the Infrastructure and Safety GPRA unit.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
• Pantex Plant funding request of $12,297,000 is to continue to treat contaminated ground water including implementing the expansion of the treatment system at the Zone 11 perched ground water to meet the requirements of CERCLA; performing monitoring of ground water; operating and maintaining landfill remedies, and working with the Federal and state agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements. • SNL funding request of $6,502,000 is to continue environmental monitoring of surface water, ground water, and soils; operating and maintaining landfill remedies, and working with Federal and state regulatory agencies and stakeholders in executing the LTS activities in a cost-effective, compliant, and safe manner and meeting the regulatory cleanup and reporting requirements.		

Site Stewardship
Nuclear Materials Integration

Description

The Nuclear Materials Integration (NMI) subprogram focuses on the consolidation and disposition of specific NNSA nuclear materials and material sets owned by multiple programs and where a single coordinated disposition program is warranted. In addition, the subprogram includes inactive actinides activities that ensure programmatic materials not in active use are properly characterized and safely packaged, and that unneeded materials have an appropriate disposition path. NMI leverages its investment in material disposition with ongoing site projects directed at accomplishing defense, research and development, national security, and other NNSA and DOE direct mission assignments. NMI also maintains and operates the Nuclear Materials Management and Safeguards System (NMMSS) that tracks and accounts for nuclear materials at DOE and the Nuclear Regulatory Commission (NRC) licensed sites, as well as the Nuclear Materials Inventory Assessment (NMIA), to manage national security and nonproliferation use and demand of accountable nuclear materials by DOE and NNSA laboratories and production plants.

FY 2017-FY 2020 Key Milestones

- In partnership with the Nuclear Regulatory Commission, continue to support routine operation and maintenance of NMMSS. Respond to ad hoc reporting and data requests from external customers (e.g., Departments of State, Commerce, National Security Council, others).
- Continue inactive actinides activities to support the treatment, consolidation and disposition of NNSA SNM that is no longer required to support the nuclear security enterprise mission at ORNL, LANL and Y-12.
- Proceduralize NMMSS and NMIA operations to ensure continuity of operations during personnel and/or operating contractor changes.
- Perform studies and analyses relating to the life-cycle management of nuclear materials specifically in regard to processing Mk-18a targets to recover Pu-244 critical to national security and nonproliferation technical programs; heavy curium in support of basic science missions, and a final waste from disposable given currently available disposal facility acceptance criteria

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Materials Integration $13,300,000	**Nuclear Materials Integration $17,510,000**	**Nuclear Materials Integration +$4,210,000**
• In partnership with the Nuclear Regulatory Commission, continue to support the operation and maintenance of NMMSS • Continue activities to support the removal of plutonium-bearing mixed oxide fuel from SNL. • Continue inactive actinides activities to support the treatment, consolidation and disposition of NNSA SNM that is no longer required to support the nuclear security enterprise mission at LANL and Y-12. • Continue treatment and disposition of NNSA materials currently stored at non-NNSA sites including the Idaho National Laboratory (sodium bonded fuels). • Maintain the technical support and cost analyses relating to the management of Heavy Isotopes Lead Material Management Organization (LMMO) at Oak Ridge National Laboratory. • Transfer Californium returned to the Loan-Lease program in storage at ORNL to requesting DOE/NNSA sites as a part of close-out of the Californium Loan-Lease Program	• In partnership with the Nuclear Regulatory Commission, continue to support the operation and maintenance of NMMSS. • Continue activities to support the removal of plutonium-bearing mixed oxide fuel from SNL and complete pre-receipt preparations, cask certification, and temporary storage of plutonium-bearing mixed oxide fuel at SNL prior to disposal Continue inactive actinides activities to support the treatment, consolidation and disposition of NNSA SNM that is no longer required to support the nuclear security enterprise mission at ORNL, LANL, and Y-12. • Continue the process and disposition NNSA materials currently stored at non-NNSA sites including the Idaho National Laboratory (sodium bonded fuels currently from or at SNL). • Maintain the technical support and cost analyses relating to the management of Heavy Isotopes Lead Material Management Organization (LMMO) at Oak Ridge National Laboratory. • Complete planning and continue activities to process and recover Pu-244 and other national asset isotopes from Mk-18a targets in storage at Savannah River. • The NMI program will also perform planning studies and analyses relating to the life-cycle management of nuclear materials.	• Increase is required to support nuclear material removal activities at Y-12, that were delayed from FY 2015 (i.e. Consolidation of Uranium Storage , Dispositions of U-Zr and Low- Equity Highly Enriched Uranium); and to continue/complete planning studies and analyses relating to the life-cycle management of nuclear materials specifically in regard to processing Mk-18a targets to recover Pu-244 critical to national security and nonproliferation technical programs; heavy curium in support of basic science missions, and to provide a final waste form compatible with currently available disposal facility acceptance criteria.

Site Stewardship
Corporate Project Management

In FY 2015 Request, Corporate Project Management was transferred from the Weapons Activities Appropriation to the NNSA Federal Salaries and Expenses Appropriation. This is consistent with the explanatory statement accompanying P.L. 113-76, Consolidated Appropriation Act for 2014, which directs the NNSA to include future funding requests for corporate project management in NNSA Federal Salaries and Expenses. The Corporate Project Management program was established to address long-standing needs identified by the Department, Congress and United States Government Accountability Office (GAO) to strengthen project management.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Corporate Project Management $0	**Corporate Project Management $0**	**Corporate Project Management $0**
• This program has been realigned under the NNSA Federal Salaries and Expenses appropriation in FY 2015 per the Consolidated Appropriation Act for 2014.	• Not applicable	• This program has been realigned under the NNSA Federal Salaries and Expenses appropriation in FY 2015 per the Consolidated Appropriation Act for 2014.

Site Stewardship
Minority Serving Institution Partnerships Program

Description

The Minority Serving Institutions (MSI) Partnerships program align investments in university capacity and workforce development with the NNSA mission to develop the needed skills and talent for NNSA's enduring technical workforce at the laboratories and production plants, and to enhance research and education at under-represented colleges and universities. NNSA MSI programs are designed to increase participation of women and minorities in the nuclear security enterprise and across the nation in science, technology, engineering and math (STEM) disciplines; developing individuals; building core competencies for NNSA; and improving institutional capacity in MSIs.

Consistent with NNSA's Strategic Plan, MSI programs such as the prestigious Massie Chairs of Excellence and symposia for African American, Hispanic and Native American youth support a pipeline of several thousand individuals each year. These include K-12, undergraduate, and graduate students; research faculty; and professors, who have been exposed to the mission, and to the science and engineering underpinning the nuclear security enterprise. Topical areas supported by the NNSA are, in most cases, fields of research that receive little funding by other government (or private) agencies, such as the National Science Foundation (NSF). A successful nuclear security enterprise requires a highly specialized workforce of well-trained scientists and engineers.

NNSA has supported MSI efforts, including Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), and various community-based organizations through the NNSA Federal Salaries and Expenses, Weapons Activities, Defense Nuclear Nonproliferation, and Naval Reactors appropriations. In FY 2012 and FY 2013, a new approach – the Minority Serving Institutions Partnerships Program – was initiated to build consortia focused on the science supporting DOE and NNSA missions. In FY 2014, a single line for MSIP funding was established in the Site Stewardship GPRA unit, aligning MSI investments with the NNSA mission and allowing for streamlined program and resource management during execution.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Minority Serving Institution Partnership Program $14,531,000	**Minority Serving Institution Partnership Program $19,085,000**	**Minority Serving Institution Partnership Program +$4,554,000**
• Massie Chairs, HBCU, HSI, TCU, and community-based grants, and MSIPP consortium based model focus research and internships on DOE science, engineering, and internships; building educational/institutional infrastructure, and enhancing the pipeline of diverse, high quality talent in STEM academic disciplines and careers.	• Massie Chairs, HBCU, HSI, TCU, and community-based grants, and MSIPP consortium based model focus research and internships on DOE science, engineering, and internships; building educational/institutional infrastructure, and enhancing the pipeline of diverse, high quality talent in STEM academic disciplines and careers.	• This increase will be utilized to effectively launch a refined Massie Chairs of Excellence Program beginning in FY 2016. This increase will result in more funds available to be applied towards research and education enhancements at under-represented colleges and universities in order to develop the needed skills and talent for NNSA's enduring technical workforce at the labs and production plants.

Site Stewardship Program Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Environmental Monitoring and Remediation - Annual percentage of environmental monitoring and remediation deliverables that are required by regulatory agreements to be conducted at NNSA sites under Long Term Stewardship (LTS) that are executed on schedule and in compliance with all acceptance criteria.							
Target	95% of deliverables	95% of deliverables	N/A	N/A	N/A	N/A	N/A
Result	100						
Endpoint Target	Annually, submit on schedule and receive regulatory approval of at least 95% of all environmental monitoring and remediation deliverables that are required at NNSA sites under LTS by regulatory agreements. Note: This measure will be tracked in the Infrastructure and Safety GPRA unit, beginning in FY 2016.						
Nuclear Materials Management and Safeguard System - Over the next five years, identify and implement efficiencies associated with the application of contemporary data management and processing technologies, within the Nuclear Materials Management and Safeguard System (NMMSS), resulting in improvement plan and implementation to achieve accuracy in reporting, better use of resources, and cost savings.							
Target	N/A	N/A	20 % cumulative progress	40 % cumulative progress	60 % cumulative progress	80 % cumulative progress	100 % cumulative progress
Result	N/A						
Endpoint Target	20% per year cumulative progress towards the measure for each fiscal year to 100% at the end of the 5th year, as represented by the following actions per year: Years 1-3 – Analysis of 3 processing modules per year Year 4 – Integration of analysis Year 5 – Completion of Process Improvement Plan Note: This is a new performance measure, beginning in FY 2016.						

Site Stewardship
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	506	506	0	0	0	0	0
Plant Projects (GPP) (<$10M)	0	0	0	0	0	0	0
Total, Capital Operating Expenses	**506**	**506**	**0**	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	506	506	0	0	0	0	0
Total, Capital Equipment (including MIE)	**506**	**506**	**0**	**0**	**0**	**0**	**0**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**506**	**506**	**0**	**0**	**0**	**0**	**0**

Outyears for Site Stewardship

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	0	0	0	0
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**0**	**0**	**0**	**0**

Defense Nuclear Security

Overview

The Defense Nuclear Security (DNS) program is an essential component of the nuclear security enterprise. The core mission is to develop and implement security programs, including protection, control and accountability of materials, as well as the physical security of all NNSA facilities, including the national laboratories, production plants, processing facilities, and the national security site, all of which support NNSA missions.

Beyond performing its core mission, DNS also provides unique knowledge and expertise in nuclear security for a broader set of 21st century national security needs, such as those in defense nuclear nonproliferation, homeland security, and intelligence, that are synergistic with its mission. The DNS program provides protection from a full spectrum of threats for NNSA personnel, facilities, nuclear material, and classified matter.

Highlights of the FY 2016 Budget Request

A concerted effort has been made to manage the security program within reduced planning targets, while continuing to meet mission needs, minimize risk, and ensure the highest priorities are met. This request provides some additional protective force Full Time Equivalents (FTEs) to support protective force training and management of shift staff/coverage of posts to reduce the need for overtime. As funds are available, efforts will be made to address aging infrastructure and obsolescence of physical security systems components, the preponderance of which are well beyond the manufacturer's lifecycle. The DNS program is able to reduce some risk through existing plans that make greater use of strategic sourcing to reduce procurement costs, improve project management and leverage emerging technologies. The DNS program also will establish greater enterprise-wide consistency in risk assessment processes and risk acceptance decision-making, and focus protective force training in the areas most in need of improvement to sustain a viable security posture within the reduced planning targets.

Major Outyear Priorities and Assumptions

Outyear funding levels for DNS total $2,658,471,000 for FY 2017 through FY 2020. In the outyears, except for the replacement of the physical security infrastructure, this funding level supports maintaining a risk-based security program and collaboration with the Department of Defense, in support of nuclear security enterprise goals.

Defense Nuclear Security
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Defense Nuclear Security					
Operations and Maintenance					
Protective Forces	398,931	398,931	388,485	385,792	-2,693
Physical Security Systems	85,934	85,934	79,866	75,205	-4,661
Information Security	37,536	35,536	30,432	29,079	-1,353
Personnel Security	34,810	34,810	34,151	32,487	-1,664
Materials Control and Accountability	29,962	29,962	28,678	23,739	-4,939
Security Program Operations and Planning	77,808	73,490	74,511	73,589	-922
Total, Operations and Maintenance	**664,981**	**658,663**	**636,123**	**619,891**	**-16,232**
Construction	**0**	**480**	**0**	**13,000**	**13,000**
Total, Defense Nuclear Security	**664,981**	**659,143**	**636,123**	**632,891**	**-3,232**

Outyears for Defense Nuclear Security
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Defense Nuclear Security				
Operations and Maintenance				
Protective Forces	394,940	410,494	417,327	425,410
Physical Security Systems	77,299	80,316	81,686	83,405
Information Security	29,792	30,964	31,481	32,100
Personnel Security	32,961	34,258	34,830	35,515
Materials Control and Accountability	24,087	25,035	25,453	25,953
Security Program Operations and Planning	74,797	77,739	79,038	80,591
Total, Operations and Maintenance	**633,876**	**658,806**	**669,815**	**682,974**
Construction	**13,000**	**0**	**0**	**0**
Total, Defense Nuclear Security	**646,876**	**658,806**	**669,815**	**682,974**

Defense Nuclear Security
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
FY 2016 estimates for the Pantex and Y-12 Sites incorporate a change in the cost model and a reduced fee rate under the Consolidated Nuclear Security contract. These changes have not yet been factored into FY 2015, as these changes were implemented after submission of the FY 2015 Congressional Budget Request and will be addressed during FY 2015 execution. ($-35,724)	
Operations and Maintenance: The decrease is greatly attributed to CNS cost model funding increases and decreases which are offset within NNSA that do not change program scope. Major change provides additional Protective Force staffing (approximately 125 Full Time Equivalents) to cover posts in an effort to minimize excessive unscheduled overtime across the enterprise (+$25,956).	**-16,232**
Construction: The increase begins to fund the replacement of the obsolete Process Equipment Control System (PECOS) alarm management system at the Nevada National Security Site's Device Assembly Facility with Argus, the current enterprise standard for Category I Special Nuclear Material protection.	**+13,000**
Total, Defense Nuclear Security	**-3,232**

Defense Nuclear Security
Operations and Maintenance

Description

Defense Nuclear Security Operations and Maintenance integrates personnel, equipment and procedures to protect physical assets and resources against theft, sabotage, diversion, or other criminal acts. Each NNSA site or facility has an approved Site Safeguards and Security Plan (SSSP) or a Site Security Plan detailing protection measures and resources needed to protect site security interests.

Protective Forces

Protective Forces provide for program oversight, duties, specialized training, performance testing, facilities, equipment, weapons/firearms, ammunition, vehicles and expenses. These forces are the site's primary front-line protection, consisting of armed, uniformed officers. Protective Forces are an integral part of a site's security posture, and are trained in all tactics and procedures necessary to protect site interests.

Physical Security Systems

Physical Security Systems provide program oversight, intrusion detection and assessment systems (IDAS), performance testing and certification/recertification, access control systems, barrier and delay mechanisms, canine explosive detection programs, and tactical systems. This includes the centrally-managed Argus program for sites possessing Category I quantities of Special Nuclear Material.

Information Security

Information Security provides for program oversight, classification guidance, Technical Surveillance Countermeasures (TSCM), Operational Security (OPSEC), and Classified Matter Protection and Control (CMPC.) This includes administrative requirements for maintaining security containers and combinations, marking, and control systems.

Personnel Security

Personnel Security provides for program oversight, access authorizations, badging programs, Human Reliability Programs, Control of Classified Visits, and Unclassified Visits and Assignments by Foreign Nationals. It encompasses the administrative support to the site clearance process, including processes for security clearance determinations at each site to ensure that individuals are eligible for access to classified information or matter and/or access to or control over special nuclear materials or nuclear weapons.

Materials Control and Accountability

Materials Control and Accountability (MC&A) provides for the control and accountability of special and alternate nuclear materials through measurements, quality assurance, accounting, containment, surveillance, and physical inventory. This subprogram also includes the Local Area Nuclear Material Accountability System (LANMAS) software application as well as training and operational support provided to Department of Energy and NNSA sites and facilities to use as the core of their nuclear accountability systems. The LANMAS software is used by 16 DOE sites, 4 of which are NNSA sites.

Security Program Operations and Planning

Security Program Operations and Planning provides direction, oversight and administration, planning, training, and development for security programs in these areas: Security Program Planning, Annual Operating Plans (AOPs), Site Security Plans and Site Safeguards and Security Plans, Vulnerability Analysis, Performance Testing and Assurance activities, Security Incident and Reporting Management, Surveys and Self-Assessments, activities related to deviation requests, Control of Security Technology Transfer Activities, and Facility Clearance and Foreign Ownership, Control or Influence (FOCI) activities.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Operations and Maintenance $636,123,000	**Operations and Maintenance $619,891,000**	**Operations and Maintenance -$16,232,000** Reflects change in the cost model and reduced fee rate under the Consolidated Nuclear Security contract. CNS cost model funding increases and decrease are offset within NNSA that do not change program scope.
Protective Forces $388,485,000	**Protective Forces $385,792,000**	**Protective Forces -$2,693,000**
• Sites maintain sufficient protective forces to meet protection requirements based on approved vulnerability assessments in accordance with the design basis specified in the 2008 Graded Security Protection policy, and comply with Departmental order requirements. • Reflects the anticipated reduction in costs under the combined NPO Management and Operating (M&O) contract.	• Sites align staffing to cover posts to minimize overtime. • Sites maintain sufficient protective forces to meet protection requirements based on approved vulnerability assessments in accordance with the design basis specified in the 2008 Graded Security Protection policy.	• Provides increased staffing to cover posts at NNSS.
Physical Security Systems $79,866,000	**Physical Security Systems $75,205,000**	**Physical Security Systems -$4,661,000**
• Maintains and begins upgrades to modernize physical security systems infrastructure. Meets Departmental order requirements and protects against the threat as documented in the 2008 Graded Security Protection policy.	• Maintains physical security systems infrastructure, barring any unforeseen systems failures. Several systems are at or beyond expected service life. Protects against the threat as documented in the 2008 Graded Security Protection policy.	• Reflects completion of minor, non-recurring projects that no longer require funding.
Information Security $30,432,000	**Information Security $29,079,000**	**Information Security -$1,353,000**
• Provides for maintaining a robust information protection program and planned infrastructure and lifecycle upgrades to the technical surveillance countermeasures (TSCM) equipment across all sites.	• Maintains an information protection program while implementing efficiencies in a risk-based manner.	• Reflects efficiencies gained via a centralized procurement plan for TSCM materials and supplies, pending validation of requirements.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Personnel Security $34,151,000	**Personnel Security $32,487,000**	**Personnel Security -$1,664,000**
• Maintains an effective personnel security program while realizing efficiencies in staffing resources at the sites, and in streamlined clearance processing.	• Maintains a personnel security program while implementing efficiencies in a risk-based manner.	• Reflects continued efficiencies in the personnel clearance processing program. • Reflects reductions to level of effort at KCP, LANL, LLNL, Pantex, and Y-12 necessitated by reduced funding levels.
Materials Control and Accountability $28,678,000	**Materials Control and Accountability $23,739,000**	**Materials Control and Accountability -$4,939,000**
• Initiates LANMAS software upgrade project. The LANMAS software upgrade represents a migration from Visual Basic 6 (VB6), which is a software platform that will not continue to be supported by vendors, to the .net platform. While the functionality of the software will not change, the migration to a new software platform will enable more cost-effective sustainment.	• Provides for effective control and accountability of special and alternative nuclear materials and maintains a level of effort that will sustain a critical part of NNSA's layered protection program. • Continues implementation of the LANMAS software upgrade.	• Reflects reductions to level of effort at LANL, NNSS, Pantex, SNL and Y-12 necessitated by reduced funding levels.
Security Program Operations and Planning $74,511,000	**Security Program Operations and Planning $73,589,000**	**Security Program Operations and Planning -$922,000**
• Maintains an effective Program Operations and Planning capability and centrally-managed funding for emerging enterprise-wide security infrastructure upgrades, projects and procurements. • Supports implementation of inter-Departmental risk-based security projects and reviews as part of the collaboration (harmonization) initiative.	• Maintains a Program Operations and Planning capability while implementing efficiencies in a risk-based manner.	• Reflects continued efficiencies in security program management. • Reflects initiative to conduct Enterprise Vulnerability Assessments to standardize development of site protection strategies.

Defense Nuclear Security
Construction

Description

The Defense Nuclear Security Construction supports critical facilities within the nuclear security enterprise. The FY 2016 request supports the startup of Project 14-D-710, Device Assembly Facility (DAF) Argus Installation Project at the Nevada National Security Site (NNSS). The Argus project works in conjunction with, and relies upon both the Entry Guard Station Expansion and Legacy completed projects. Argus is necessary to support the DAF complex which is a critical facility within the Nuclear Security Enterprise (NSE), designed for the staging of special nuclear material.

The Argus security system will replace the aging Process Equipment and Control System (PECOS) in the DAF at the NNSS. Argus is the recommended NNSA enterprise security system and integrates access control, intrusion detection, and video assessment of alarms to protect and control high-consequence assets. Completion of this project provides the required security to protect special nuclear material (SNM) using capabilities of the HSPD-12 badge credentials.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Construction $0	**Construction $13,000,000**	**Construction +$13,000,000**
• No FY 2015 funding requested.	• Replace the obsolete PECOS alarm management system at the NNSS DAF with Argus, the current enterprise standard for Category I Special Nuclear Material protection.	• Adjusted to accommodate a line-item FY 2016 start.

Defense Nuclear Security Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Protective Force Training Reform - Implement and sustain an Enterprise Mission Essential Task List (EMETL)-based training program for protective forces at all eight NNSA sites.							
Target	90% Index	90% Index	90% Index	90% Index	95% Index	95% Index	95% Index
Result	100						
Endpoint Target	By FY 2017, produce protective forces that are high-performing in mission accomplishment with a necessary/appropriate training program that minimizes unproductive training time, maintaining a 95% index thereafter.						
Physical Security Infrastructure Recapitalization – Implement and maintain a physical security life cycle management process, including on-time and to standard supplemental deliverables after implementation.							
Target	85% Index	85% Index	90% Index	90% Index	95% Index	95% Index	95% Index
Result	100						
Endpoint Target	By 2017, achieve defensible prioritization of systems investments based on risk, more efficient bulk procurements, more common systems configurations/designs, timely redistribution of inventories based on site needs, and more accurate reporting to external stakeholders on condition of NNSA security systems, maintaining a 95% index thereafter.						
Enterprise Risk Management – Implement and sustain a repeatable process for conducting site vulnerability and risk assessments and a set of consistent deliverables to help Federal oversight ensure the security program is integrated, robust and efficient.							
Target	90% Index	90% Index	90% Index	90% Index	95% Index	95% Index	95% Index
Result	90						
Endpoint Target	By 2017, achieve an improved corporate understanding of site operations, protection strategies, and risk acceptance that enables decision-makers to make true cost/benefit and risk acceptance decisions for physical security, better risk-informed resource allocation decisions, and more balance across NNSA sites, maintaining a 95% index thereafter.						

Defense Nuclear Security
Construction Projects Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
14-D-710, Device Assembly Facility (DAF) Argus Installation, NNSS, Las Vegas, NV							
Total Estimated Cost (TEC)	31,916	5,916	0	0	0	13,000	+13,000
Other Project Cost (OPC)	5,667	3,067	0	0	0	500	+500
TPC, 14-D-710, DAF/Argus, NNSS	**37,583**	**8,983**	**0**	**0**	**0**	**13,500**	**+13,500**
08-D-701, Nuclear Materials S&S Upgrade Project, Phase 2, LANL							
Total Estimated Cost (TEC)	221,051	220,571	0	480	0	0	0
Other Project Cost (OPC)	23,149	23,149	0	0	0	0	0
TPC, 08-D-701, NMSSUP, Phase 2, LANL	**244,200**	**243,720**	**0**	**480**	**0**	**0**	**0**
Total All Constructon Projects							
Total Estimated Cost (TEC)	19,396	5,916	0	480	0	13,000	+13,000
Other Project Cost (OPC)	9,483	8,983	0	0	0	500	+500
Total Project Cost (TPC) All Construction Projects	**28,879**	**14,899**	**0**	**480**	**0**	**13,500**	**+13,500**

Outyears to Completion for Defense Nuclear Security

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
14-D-710, Device Assembly Facility (DAF) Argus Installation, NNSS, Las Vegas, NV				
Total Estimated Cost (TEC)	13,000	0	0	0
Other Project Cost (OPC)	300	750	1,050	0
Total, 14-D-710, Device Assembly Facility (DAF) Argus Installation, NNSS, Las Vegas, NV	**13,300**	**750**	**1,050**	**0**
Total All Construction Projects				
Total Estimated Cost (TEC)	13,000	0	0	0
Other Project Cost (OPC)	300	750	1,050	0
Total Project Cost (TPC) All Construction Projects	**13,300**	**750**	**1,050**	**0**

Defense Nuclear Security
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	26,311	14,992	3,637	3,637	3,799	3,883	84
Plant Projects (GPP) (<$10M)	50,915	50,915	0	0	0	0	0
Total, Capital Operating Expenses	**77,226**	**65,907**	**3,637**	**3,637**	**3,799**	**3,883**	**+84**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	26,311	14,992	3,637	3,637	3,799	3,883	84
Total, Capital Equipment (including MIE)	**26,311**	**14,992**	**3,637**	**3,637**	**3,799**	**3,883**	**84**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**50,915**	**50,915**	**0**	**0**	**0**	**0**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**50,915**	**50,915**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**77,226**	**65,907**	**3,637**	**3,637**	**3,799**	**3,883**	**+84**

Outyears for Defense Nuclear Security

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	0	0	0	0
Plant Projects (GPP) (<$10M)	260	266	272	+278
Total, Capital Operating Expenses	**260**	**266**	**272**	**+278**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	260	266	272	+278
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**260**	**266**	**272**	**+278**
Total, Capital Summary	**260**	**266**	**272**	**+278**

Defense Nuclear Security
Other Information

Full Cost Recovery Estimates

(Dollars in Thousands)

	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 $
Site				
Kansas City Plant	212	426	250	-176
Lawrence Livermore National Laboratory	9,300	12,000	12,500	500
Los Alamos National Laboratory	3,500	3,674	3,900	226
Nevada National Security Site	2,050	2,000	0	-2,000
NNSA Production Office	0	0	1,200	1,200
Sandia National Laboratories	16,500	16,500	17,000	500
Total	**31,562**	**34,600**	**34,850**	**250**

The FY 2016 request provides direct funding for mission-based program for Defense Nuclear Security. Work for Others will continue to fund an allocable share of the base program through full cost recovery. Extraordinary security requirements for Work for Others projects will be a direct charge to those customers.

14-D-710, Device Assembly Facility (DAF) Argus Installation Project
Nevada National Security Site (NNSS), Las Vegas, NV
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes
This Construction Project Data Sheet (CPDS) is an update of the FY 2014 CPDS and includes a new start for the budget year.

The project was to be performed as a "new start" for FY 2014. The 14-D-710 line item was authorized, but not appropriated in FY 2014. Since the FY 2014 budget submittal, the project has undergone four significant changes:

- Project was directed to account for the impacts of implementing Department of Energy (DOE) Order (O) 473.3 *Protection Program Operations* within the scope of the Argus project as it would be deployed in DAF which added approximately $5M in new scope (both design and construction).
- Project was paused then eventually formally shut down. Efforts were taken to retain design products and project records, but the system designers have been lost and the project team disbanded.
- Project start-up and turnover phase has been strengthened to incorporate lessons learned from other Security projects across the DOE complex.
- This CPDS has been adjusted to accommodate a FY 2016 start.

The Performance Baseline was projected at a Total Estimated Cost (TEC) of $20.3M and a Total Project Cost (TPC) of $24.3M as a FY 2014 new start (including prior year funding under the GPP). The combined impacts of the changes above have resulted in revised TEC of $29.6M and a TPC of $35.3M. This CPDS assumes funding in FY 2016 to support a March 2016 project start. The project schedule is extended with a new completion date of 4 quarter (Q) 2019.

Summary
The Argus Project (Argus) originated as a General Plant Project (GPP) in FY 2010, with planning commencing in FY 2011. In November 2012, during design and after the majority of equipment procurement, it was determined that the project would exceed the GPP limit. This resulted from several factors including a prime contract change with the NNSS security services contractor, WSI-Nevada, as they became precluded from performing Davis-Bacon (DB) covered work. This work was appropriately reassigned for performance by the site's Management and Operations contractor, National Security Technologies, ^{LLC} (NSTec). The difference in the cost structure between the two companies resulted in some of the cost increases. Other changes in the technical approach, and a more thorough development of risk management considerations for a major security system's design, construction, and operations cut-over within the DAF, a Safeguards Category I, Hazard Class 2 Nuclear Facility, also contributed to increases in the projected cost at completion.

By January 2013, a decision was made to convert this GPP, and complete it as a Line Item (LI) project. This action addressed the projected cost considerations noted above and also supported an execution strategy believed to be more responsive to complex-wide lessons learned in implementing complex security projects. Argus completed most of the system design within the GPP execution period, and a significant level of conceptual planning followed by preliminary planning for startup testing, acceptance, cyber security, and system cut-over, as well as a commensurate amount of project management.

In this new CPDS, the GPP expenditures discussed above are included in the pre-FY 2014 rows of Section 5. This CPDS includes the remaining design, shown in FY 2016, and all physical construction, startup, acceptance, and cut-over activities.

A Federal Project Director has been assigned to this project and has approved this CPDS.

2. Critical Milestone History[a]

	CD-0	CD-1	Design Complete	CD-2	CD-3	CD-4	D&D Start	D&D Complete
FY 2014	N/A	N/A	N/A	4QFY2013	4QFY2013	4QFY2013	N/A	N/A
FY 2016	N/A	N/A	4QFY2016	4QFY2016	4QFY2016	4QFY2019	N/A	N/A

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated date the project design will be completed
CD-3 – Approve Start of Construction
D&D Complete – Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

3. Project Cost History[b]

(fiscal quarter or date)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2014	2,500	17,823	20,323	3,987	N/A	3,987	24,310
FY 2016[c]	3,500	26,133	29,633	5,667	N/A	5,667	35,300

4. Project Scope and Justification

Scope

The DAF Argus project primarily consists of the following items:

- Install and use Argus security system equipment and software as developed by the Lawrence Livermore National Laboratory (LLNL).
- Replace the existing multiplexers, badge readers, and key pads with Argus Field Panels and Remote Access Panels with integral fingerprint readers to control access/egress to DAF.
- Use the existing alarm sensors.
- Connect existing Perimeter Intrusion Detection and Assessment System (PIDAS) sensors to new Argus Field Panel-II (replacing existing PIDAS multiplexer panels) and to the new host computers in the Central Alarm Station (CAS) and Secondary Alarm Station (SAS).

Justification

The Argus security system will replace the aging Process Equipment and Control System (PECOS) in the DAF at the NNSS. Argus is the recommended NNSA enterprise security system and integrates access control, intrusion detection, and video assessment of alarms to protect and control high-consequence assets. Completion of this project provides the required security to protect special nuclear material (SNM) using capabilities of the HSPD-12 badge credentials.

[a] The schedules and estimates are projections pending completion and approval of the Performance Baseline. Project was initiated as a General Plant Project that was not subject to the formal DOE Order 413.3B process. Nevada Site Office held decision meetings to start project after authorization from NNSA HQ.
[b] The estimates are projections pending completion and approval of the Performance Baseline.
[c] No further physical construction activities will be performed until the project performance baseline has been validated and CD-2/3 has been approved.

The Argus project works in conjunction with, and relies upon both, the Entry Guard Station Expansion and Legacy completed projects. Argus is necessary to support the DAF complex which is a critical facility within the nuclear security enterprise designed for the staging of special nuclear material and nuclear explosive operations.

Operations conducted for the program missions include assembling, disassembling, modifying, staging, handling, transporting, and non-explosive testing of nuclear explosives and components, subcritical test assemblies, and other special operations involving high explosives (HE) and/or radioactive materials.

The project is being conducted in accordance with project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets.

5. Financial Schedule[a]

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2010	981	981	0
FY 2011	519	519	600
FY 2012	N/A	N/A	900
FY 2013	N/A	N/A	0
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	0
FY 2016	N/A	N/A	2,000
FY 2017	N/A	N/A	0
FY 2018	N/A	N/A	0
FY 2019	N/A	N/A	0
Total, Design	N/A	N/A	3,500
Construction			
FY 2011	2,133	2,133	700
FY 2012	N/A	N/A	900
FY 2013	N/A	N/A	533
FY 2014	N/A	N/A	0
FY 2015	N/A	N/A	0
FY 2016	N/A	N/A	3,900
FY 2017	N/A	N/A	9,800
FY 2018	N/A	N/A	9,599
FY 2019	N/A	N/A	701
Total, Construction	N/A	N/A	26,133

[a] The schedules and estimates are projections pending completion and approval of the Performance Baseline.

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2010	981	981	0
FY 2011	2,652	2,652	1,300
FY 2012	0	0	1,800
FY 2013	0	0	533
FY 2014	0	0	0
FY 2015	0	0	0
FY 2016	13,000	13,000	5,900
FY 2017	13,000	13,000	9,800
FY 2018	0	0	9,599
FY 2019	0	0	701
Total, TEC	29,633	29,633	29,633
Other Project Cost (OPC)			
OPC except D&D			
FY 2010	1,300	1,300	775
FY 2011	1,360	1,360	215
FY 2012	0	0	977
FY 2013	407	407	500
FY 2014	0	0	600
FY 2015	0	0	0
FY 2016	500	500	500
FY 2017	300	300	300
FY 2018	750	750	750
FY 2019	1,050	1,050	1,050
Total, OPC except D&D	5,667	5,667	5,667
D&D			
Total, D&D	0	0	0
Total OPC	5,667	5,667	5,667
Total Project Cost (TPC)			
FY 2010	2,281	2,281	775
FY 2011	4,012	4,012	1,515
FY 2012	0	0	2,777
FY 2013	407	407	1,033
FY 2014	0	0	600
FY 2015	0	0	0
FY 2016	13,500	13,500	6,400
FY 2017	13,300	13,300	10,100
FY 2018	750	750	10,349
FY 2019	1050	1,050	1,751
Total, TPC	35,300	35,300	35,300

6. Details of Project Cost Estimate[a]

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	2,900	2,250	N/A
Contingency	600	250	N/A
Total, Design	3,500	2,500	N/A
Construction			
Site Work	0	0	N/A
Long-lead Equipment	2,700	1,500	N/A
Construction	18,583	13,823	N/A
Contingency	4,850	2,500	N/A
Total, Construction	26,133	17,823	N/A
Total, TEC	29,633	20,323	N/A
Contingency, TEC	5,450	2,750	N/A
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	1,300	1,300	N/A
Conceptual Design	600	600	N/A
Start-up	2,817	1,587	N/A
Contingency	950	500	N/A
Total, OPC except D&D	5,667	3,987	N/A
D&D			
D&D	0	0	N/A
Contingency	0	0	N/A
Total, D&D	0	0	N/A
Total, OPC	5,667	3,987	N/A
Contingency, OPC	950	500	N/A
Total, TPC	35,300	24,310	N/A
Total, Contingency	6,400	3,250	N/A

[a] The schedules and estimates are projections pending completion and approval of the Performance Baseline. When the Performance Baseline is approved, it will become the Original Validated Baseline.

7. Schedule of Appropriation Requests

		Prior Years	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Outyears	Total
FY 2014	TEC	20,323	0	0	0	0	0	0	20,323
	OPC	2,660	327	500	500	0	0	0	3,987
	TPC	22,983	327	500	500	0	0	0	24,310
FY 2016	TEC	3,633	0	13,000	13,000	0	0	0	29,633
	OPC	3,067	0	500	300	750	1,050	0	5,667
	TPC	6,700	0	13,500	13,300	750	1,050	0	35,300

8. Related Operations and Maintenance Funding Requirements

Start of Operation of Beneficial Occupancy (fiscal quarter or date)	4QFY 2019
Expected Useful Life (number of years)	30
Expected Future Start of D&D of this capital asset (fiscal quarter)	2QFY 2049

(Related Funding Requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	TBD	TBD	TBD	TBD
Utilities	TBD	TBD	TBD	TBD
Maintenance & Repair	TBD	TBD	TBD	TBD
Total	TBD	TBD	TBD	TBD

9. D&D Information

There is no new area being constructed in this construction project.

	Square Feet
New area being constructed by this project at NNSS	0
Area of D&D in this project at NNSS	0
Area at NNSS to be transferred, sold, and/or D&D outside the project including area previously "banked"	0
Area of D&D in this project at other sites	0
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously "banked"	0
Total area eliminated	0

10. Acquisition Approach

Project was originated and executed as a GPP through FY 2013. It is being converted and will be completed as a LI project beginning in FY 2016. It will be executed by an integrated contractor team of LLNL (system design contractor), WSI-Nevada (system design and end-user/security contractor) and NSTec (installation and site/facility managing and operating contractor).

Information Technology and Cybersecurity

Overview

Information Technology (IT) and Cybersecurity support the diverse civilian nuclear security enterprise of NNSA. It supports information technology and cybersecurity solutions, including continuous monitoring, cloud-based technologies, enterprise wireless and security technologies (i.e., identity, credential, and access management) to help meet security challenges. The focus for the next five years is to continue providing superior information management support to current operations while implementing unclassified and classified cloud-based technologies to enhance the nuclear security mission. To ensure the protection of NNSA information and information assets, NNSA Information Technology and Cybersecurity Program will collaborate and coordinate with the Department of Energy (DOE) Office of the Chief Information Officer to develop, improve and implement the Joint Cybersecurity Coordination Center (JC3) The requested funds for Information Technology and Cybersecurity Program, provides for the operation of cyber infrastructure at NNSA sites, implementation of requirements for classified computing environment directed by the Committee on National Security Systems (CNSS), and Public Key Infrastructure (PKI) capabilities for authentication to secret networks and applications.

The NNSA Information Technology and Cybersecurity Program is focused on the development of a suite of IT initiatives that provide a state-of-the-art technology infrastructure for enabling the nuclear security mission and future nuclear security enterprise shared services. These initiatives will fundamentally re-architect the NNSA IT environment to provide a secure set of capabilities including unified networking, federated identity services, agile cloud infrastructure, and next-generation collaboration services across the nuclear security enterprise including headquarters, laboratories, and plants. The approach will provide commodity services that can be leveraged by future investments and the Management and Operating (M&O) partners, to improve security of sensitive unclassified and classified NNSA data, lower IT costs, and host shared services. In addition, the strategy will provide a dramatic step forward in collaboration capabilities by delivering a federated, unclassified, unified communications capability and the deployment of a secure, agency wide network.

The Information Technology and Cybersecurity Program sets forth goals and objectives to guide the execution of the NNSA Information Management Program in support of the NNSA mission. Achieving these goals and objectives will enable NNSA to improve protection of information, information assets, counter new and evolving threats, educate and enable its workforce, and support the development of mission-oriented requirements that effectively integrate security into everyday operations.

Achieving and maintaining a secure NNSA information environment for the enterprise requires an approach that combines defense-in-depth and defense-in-breadth principles with essential guiding tenets that align the Information Technology and Cybersecurity Program with NNSA cultural and business drivers. The underlying set of four guiding tenets of risk management, agility, trust, and partnership align with the people, processes and technology elements to support the defense-in-depth values of achieving mission effectiveness and are integral to the success of the Information Technology and Cybersecurity Program.

While facing the current challenges, the NNSA Information Technology and Cybersecurity Program will continue to focus its energy on improving both the performance of its staff and the security of the IT environment across the nuclear security enterprise. We will continue to maintain and modernize the aging IT and cybersecurity infrastructure that supports mission activities within the weapons program, classified information processing environment, nuclear material transport, weapon modernization, and incident response. The NNSA Information Technology and Cybersecurity Program will continue to work diligently to evaluate risk and allocate resources to reduce threats in order to enable the mission of the NNSA.

Highlights of the FY 2016 Budget Request

Cybersecurity Crosscut: The Department of Energy (DOE) is engaged in three categories of cyber-related activities: protecting the DOE enterprise from a range of cyber threats that can adversely impact mission capabilities; bolstering the U.S. Government's capabilities to address cyber threats; and, improving cybersecurity in the electric power subsector and the oil and natural gas subsector. The cybersecurity crosscut supports central coordination of the strategic and operational aspects of cybersecurity and facilitates cooperative efforts such as the Joint Cybersecurity Coordination Center (JC3) for incident response, Insider Threat Program and the implementation of Department-wide Identity, Credential and Access Management (ICAM).

In FY 2016, the Information Technology and Cybersecurity Program plans to:

- Complete the recapitalization of the Enterprise Secure Network (ESN) and develop a life-cycle management plan for hardware and software components.
- Modernize the Cybersecurity infrastructure, comprised of almost 100 sensors and over 70 data acquisition servers dispersed nationwide for the NNSA's Information Assurance Response Center (IARC). IARC is responsible for providing 24/7/365 Cybersecurity services to some 66 and growing NNSA and DOE networking enclaves. IARC's services and service levels meet strict Federal requirements that allow sites to maintain mission-essential access to the Federal classified networks (SIPRNet and ESN). IARC also provides near-real-time network defense and incident response services that protect these classified and unclassified enclaves and information from attacks. As a participant with the Joint Cybersecurity Coordination Center (JC3) Program, IARC also supports enterprise-level cyber threat management and situational awareness for the Department.
- Implement the Identity, Credential and Access Management (ICAM) project at NNSA Headquarters and site elements. This entails ensuring the security of our facilities, and the people and information that use them. We must be able to confirm identities. This includes people, computing/communications devices, networks, information systems, applications, and data, as well as DOE/NNSA and Service Component (SC) real property and other selective SC material (e.g., weapons systems).
- Implement and coordinate all CNSS, national, departmental and local requirements. The CNSS is the interagency body responsible for safeguarding the National Security Systems (NSS). Their requirements include specific actions in the following six areas: access control**,** enterprise audit, insider threat, reduce anonymity, removable media, and continuous monitoring.
- Continue to leverage the 2NV framework to increase the efficiency and cost-effectiveness of NNSA IT services, consistent with the DOE IT Modernization Strategy and the Federal Information Technology Shared Services Strategy.
- Implement the NNSA Application Modernization Strategy, which will seek to minimize the number of disparate NNSA Federal business and mission support IT applications in favor of a platform-based approach that will facilitate reduced hardware, software, and labor costs via rapid application development, single sign-on, and maximum re-use of hardware infrastructure, software licenses, custom code, logic/workflows, data objects; and organized efforts to cultivate enterprise-wide adoption of shared infrastructure capabilities by the NNSA Federal and M&O communities.

Major Outyear Priorities and Assumptions

Outyear funding levels for Information Technology and Cybersecurity for FY 2017 through FY 2020 total $639,760,000. The NNSA Information Technology and Cybersecurity Program will continue to work toward transforming the information technology and cybersecurity environment. This will be accomplished within funding levels over the next five years by delivering capabilities to support the unclassified and classified technologies environments.

Information Technology and Cybersecurity
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Information Technology and Cybersecurity					
Cybersecurity					
Infrastructure Program	105,441	105,441	140,805	108,188	-32,617
Technology Application Development	4,000	4,000	4,000	6,000	+2,000
Total, Cybersecurity	**109,441**	**109,441**	**144,805**	**114,188**	**-30,617**
Enterprise Secure Computing	**10,000**	**10,000**	**10,000**	**18,400**	**+8,400**
Federal Unclassified Information Technology	**25,627**	**25,001**	**24,841**	**25,000**	**+159**
Total, Information Technology and Cybersecurity	**145,068**	**144,442**	**179,646**	**157,588**	**-22,058**

Outyears for Information Technology and Cybersecurity
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Information Technology and Cybersecurity				
Cybersecurity				
Infrastructure Program	111,932	113,951	117,084	120,393
Technology Application Development	4,000	4,000	4,000	4,000
Total, Cybersecurity	**115,932**	**117,951**	**121,084**	**124,393**
Enterprise Secure Computing	**14,100**	**13,800**	**15,900**	**16,600**
Federal Unclassified Information Technology	**25,000**	**25,000**	**25,000**	**25,000**
Total, Information Technology and Cybersecurity	**155,032**	**156,751**	**161,984**	**165,993**

Information Technology and Cybersecurity
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Cybersecurity: The decrease is attributed to the FY 2015 one-time increase in the Infrastructure Program to implement a more secure classified computing environment. All activities related to the increase in FY 2015 were completed.	**-30,617**
Enterprise Secure Computing: The increase is to support recapitalization of the Enterprise Secure Network. Recapitalization of the ESN includes the upgrade to both software and hardware components of the network such as routers, switches, and Internetwork Operating System (Ios).	**+8,400**
Federal Unclassified Information Technology: Increase maintains existing unclassified commodity (such as: desktop computers, printers and mobile devices) and mission information technology capability.	**+159**
Total, Information Technology and Cybersecurity	**-22,058**

Description

The highly complex and global nature of the NNSA mission environment makes it critically important that information and information assets are managed and protected using an effective risk management approach. Well-informed management decisions require a systematic understanding of the risks inherent in the use of information systems. All information collected, created, processed, transmitted, stored, or disseminated by, or on behalf of, the NNSA on automated information systems requires a level of protection commensurate with the risk to the information and the associated information processing systems. The information systems facilitating these activities must also be protected.

Infrastructure Program

The infrastructure program supports the cybersecurity operations and activities at NNSA M&O and Federal sites. The cybersecurity operations and infrastructure program is built around a defense-in-depth approach for achieving cybersecurity in a highly networked environment. The defense-in-depth approach is a combination of known best practices and cost strategy that relies on the intelligent application of techniques and technologies which exist today that address the increasing number and complexity of cybersecurity threats, vulnerabilities and risks.

Technology Application Development

Technology Application Development is responsible for developing and advancing policies and initiatives that will support short and long-term solutions to specific cybersecurity needs at NNSA sites and headquarters locations and will focus on emerging technologies and leverage existing technology resources to create a more secure environment.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Cybersecurity $144,805,000	**Cybersecurity $114,188,000**	**Cybersecurity -$30,617,000**
Infrastructure Program $140,805,000	**Infrastructure Program $108,188,000**	**Infrastructure Program -$32,617,000**
• Leverage cloud computing to enable a low-cost shared services model. • Finalize Implementation of the NNSA Continuous Asset Monitoring (CAM) Program within the NNSA unclassified mission computing environment. • Identify and document NNSA mission critical information systems and applications. • Support NNSA Information Assurance Response Center sensor upgrade. • Maintain and support the infrastructure program that supports the cybersecurity operations and activities at NNSA M&O sites around a defense-in-depth approach. • Implement and coordinate CNSS requirements. • PKI implementation on classified networks. • Leverage Secret Fabric Application Hosting Environment (AHE) for deploying shared services and applications.	• Complete move to new building for JC3 IARC. • Start the replacement of aging IT/Cyber infrastructure components. • Finalize implementation of the NNSA Continuous Asset Monitoring Program within the classified computing environment	• The decrease is attributed to the FY 2015 one-time increase in the Infrastructure Program to implement a more secure classified computing environment. All activities related to the increase in FY 2015 were completed.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Technology Application Development $4,000,000	**Technology Application Development $6,000,000**	**Technology Application Development +$2,000,000**

• Research a layered defense-in-depth cybersecurity model across the NNSA enterprise that will ensure integrated and layered protections are implemented consistently across NNSA computing environments.
• Implement JC3 capabilities for the classified environment.
• Oversee the development of JC3 unclassified and classified capabilities with the M&O's.
	• Support the cyber research to focus on higher-risk game-changing technologies targeted towards solving fundamental cybersecurity problems related to protecting the nuclear security enterprise. The research will focus on the following three signature programs:
	  • Resilience and Assurance
	  • Big Data and Behavioral Cyber Analytics
	  • Scalable Testing of Cyber System Dynamics
		• Increase supports ongoing work at the national laboratories and R&D projects to improve the protection architecture of the nuclear security enterprise in the long term and to support DOE's activities to improve cybersecurity.

Information Technology and Cybersecurity
Enterprise Secure Computing

Description
Enterprise Secure Computing (ESC) provides state-of-the-art enterprise level classified computing infrastructure that enables effective collaboration and information sharing necessary for the NNSA enterprise. It has two components:

- The NNSA Secret Network (NSN) allows the processing of Secret/National Security Information (NSI) and allows interconnection with DoD SIPRNET.
- The Enterprise Secure Network (ESN) operates at the Secret/Restricted Data level and consists of independent site installations of standardized equipment and commercial off-the-shelf (COTS) software integrated through a common infrastructure and shared policies and procedures.

NSN/ESC features an enterprise-level identity model, strong (two-factor) authentication, and a centralized monitoring and analysis capability. The program provides the necessary secure infrastructure and cybersecurity systems required to meet the informational needs of the science-based stockpile stewardship program with a modeling and simulation-based science and engineering environment. ESC provides a broad base of security and network services that include: application integration; authentication services; directory services; enterprise data resource management; IARC Security Operations Center and Network Operations Center; Identity and Access Management; PKI; and security monitoring /intrusion detection. NSN provides a broad base of security and network services that include: application integration; authentication services; directory services; enterprise data resource management; IARC Security Operations Center and Network Operations Center; PKI; and security monitoring/intrusion detection.

NSN/ESN is the classified environment with which all of the DOE/NNSA laboratories and sites communicate and share information regarding NNSA's primary mission. ESC continually looks to improve the infrastructure of our network in order to provide our services to the enterprise. An example of this is the new Virtual TeleConference (VTC) capability and Virtual Desktop Infrastructure (VDI). The servers, routers, and taclanes we have procured for the network are all considered the minimum required to achieve the necessary security.

ESN is also serving as the base network for the classified commodity services, which entails a next-generation approach to classified collaborative computing using the above-mentioned secure virtual desktop infrastructure (VDI) to enable the disparate DOE/NNSA entities to share information. An effort to consolidate disparate classified networks is currently underway. This will enable the NNSA Information Technology and Cybersecurity Program to more effectively manage classified information and to maximize the actual networks, infrastructures and capabilities into a greater whole. Also, an enterprise-wide project is underway to consolidate services within a cloud structure, enhance redundancy in the infrastructure and provide additional security measures.

The NSN/ESN is currently deployed at all NNSA and multiple DOE sites, other departments and organizations, and select allied nations. There are additional sites being integrated and limited-access gateways under development and improvement.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Enterprise Secure Computing $10,000,000	**Enterprise Secure Computing $18,400,000**	**Enterprise Secure Computing +$8,400,000**
• Continue integration of Product Realization Integrated Digital Enterprise (PRIDE) applications. • Implement classified cloud computing for the 2NV Virtual Desktop Infrastructure. • Implement Two-factor authentication PKI for NSI infrastructure. • Develop a solution for Voice over IP (VoIP) within the classified environment. • Develop and Implement enterprise email and commodity IT services. • Establish enterprise customer support services help desk. • Develop and Implement cost recovery process for enterprise IT services.	• Upgrade and enhance classified applications and services to improve collaboration and information sharing. • Transition participating sites to enterprise VDI. • Expand NSI infrastructure to provision commodity services. • Two-factor authentication PKI for Secret/Restricted Data infrastructure. • Implement high performance desktop computing. • Recapitalization of the enterprise secure network.	• The increase is to support recapitalization of the Enterprise Secure Network. Recapitalization of the ESN includes the upgrade to both software and hardware components of the network such as routers, switches, and Internetwork Operating System (IOS).

Information Technology and Cybersecurity
Federal Unclassified Information Technology

Description

Federal Unclassified Information Technology provides corporate-type services in the areas of business, technology, finance, legal, and management to the Site Offices, Service Centers, and NNSA Headquarters upon request in order to accomplish the NNSA mission. Services include, but are not limited to: design, development and maintenance of all aspects of NNSA field computing activities; voice and data resources for effective communications between NNSA site offices, contractors and NNSA Headquarters; information assurance and cyber security; records management support; coordination, review and publication of NNSA directives; and printing and reproduction and forms management services.

Federal Unclassified Information Technology provides commodity computing infrastructure, which enables effective collaboration and information sharing necessary for NNSA Federal employees and support contractors. The 2NV vision and strategy will shift from a traditional, costly desktop support model to a cloud-provisioned virtualized desktop-based solution. The 2NV is the IT transformation that is a foundational activity towards implementing the OneNNSA vision. Each of the investments in the 2NV portfolio directly supports a cybersecurity outcome. OneVoice provides an encrypted collaboration suite for multi-site communications; OneNNSA Network provides a secure encrypted wide area network solution over the ESN network, and OneID provides secure, single sign on capabilities. In order to think, behave, and respond as one cohesive agency with a shared, critical national security mission, it is necessary to re-engineer our telecommunications networks to remove the technical barriers to collaboration and to outfit our employees with the effective communication tools to maximize their efficiency and lower operational costs.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Federal Unclassified Information Technology $24,841,000	**Federal Unclassified Information Technology $25,000,000**	**Federal Unclassified Information Technology +$159,000**
• Implementation of current 2NV-related technology, OneNNSA Network, YourCloud, OneID and OneVoice. • Coordinate the delivery of Federal desktop services as provisioned by OCIO. • Provide IT technical services and incidental advisory and assistance services. • Provide hardware and software licensing, maintenance and refresh. • Provide funding to field offices for IT services provisioned by their M&O partners.	• Continue to support the deployment of information technology enhancement which enables effective collaboration and information sharing necessary for NNSA Federal employees and support contractors to carry out the NNSA's mission. • Coordinate and oversee the delivery of Federal desktop services as provisioned by the Department of Energy. • Provide IT technical services and incidental advisory and assistance services. • Oversee the implementation of hardware and software licensing, maintenance and refresh. • Provide funding to field offices for IT services provisioned by their M&O partners. • Work with the NNSA M&O partners to begin the implementation of a shared services model within the YourCloud environment. • Provide oversight of the M&O partners' unclassified IT programs. • Develop and Implement the application modernization project.	• Increase maintains existing unclassified commodity (such as: desktop computers, printers and mobile devices) and mission information technology capability.

Information Technology and Cybersecurity Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Cybersecurity Assessment Reviews - Annual Percentage of Cybersecurity Site Assessment Reviews conducted by the Office of Enterprise Assessments (EA) and that resulted in the rating of "effective."							
Target	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating	100% of reviews resulting in "effective" rating
Result	100						
Endpoint Target	Annually, achieve at least an effective rating of 100% of OCIO site assistance visits (SAV) Cybersecurity reviews.						

Information Technology and Cybersecurity
Other Information

Full Cost Recovery Estimates

(Dollars in Thousands)

	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015 $
Site				
Kansas City Plant	185	400	400	0
Lawrence Livermore National Laboratory	1,900	2,200	2,200	0
Los Alamos National Laboratory	1,200	1,400	1,400	0
Nevada National Security Site	600	600	600	0
National Production Office	70	80	80	0
Sandia National Laboratories	7,100	8,000	8,000	0
Total	**11,055**	**12,680**	**12,680**	**0**

The Department requests and receives direct appropriations for funded, mission-driven activities focused on research and development of information technology and cybersecurity solutions. Because some support is provided to other programs, including Work for Others (WFO), starting in FY 2014, the Department began charging full cost recovery for these materials and services provided to agencies outside the Department.

These costs will be allocated to the WFO customers as work is accomplished at the contractor site. The table above provides an estimated of costs that will be recovered from WFO customers.

Domestic Uranium Enrichment
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Domestic Uranium Enrichment					
Operations and Maintenance (O&M)	0	0	97,200	0	-97,200
Domestic Uranium Enrichment Research, Development and Demonstration	62,000	105,952	0	0	0
Total, Domestic Uranium Enrichment	**62,000**	**105,952**	**97,200**	**0**	**-97,200**

Outyears for Domestic Uranium Enrichment
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Domestic Uranium Enrichment				
Operations and Maintenance (O&M)	0	0	0	0
Domestic Uranium Enrichment Research, Development and Demonstration	0	0	0	0
Total, Domestic Uranium Enrichment	**0**	**0**	**0**	**0**

[a] Funding reflects the transfer of Domestic Uranium Enrichment to Nuclear Materials Commodities program within the Directed Stockpile Work program, in accordance with the Consolidated and Further Continuing Appropriations Act, 2015.

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Argonne National Laboratory			
Science			
Science Campaign	3,350	1,000	0
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	500	500	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	50	20	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	2,449	2,290	0
Total, Argonne National Laboratory	**6,349**	**3,810**	**0**
Brookhaven National Laboratory			
Science			
Science Campaign	20	0	0
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	50	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	200	200	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	2,367	1,635	0
Total, Brookhaven National Laboratory	**2,587**	**1,885**	**0**
Chicago Operations Office			
Science			
Science Campaign	0	100	0
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	1,500	0	0
Total, Chicago Operations Office	**1,500**	**100**	**0**
Consolidated Business Center			
Site Stewardship			
Site Stewardship	0	430	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	800	700	0
Total, Consolidated Business Center	**800**	**1,130**	**0**
General Atomics Site			
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	17,489	23,030	23,500
Total, General Atomics Site	**17,489**	**23,030**	**23,500**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Idaho National Laboratory			
Directed Stockpile Work			
Directed Stockpile Work	300	2,385	2,308
Site Stewardship			
Site Stewardship	937	0	985
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	353	0	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	4,360	3,582	0
Total, Idaho National Laboratory	**5,950**	**5,967**	**3,293**
Kansas City Plant			
Directed Stockpile Work			
Directed Stockpile Work	256,614	291,379	336,381
Site Stewardship			
Site Stewardship	3,867	5,869	0
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	250	0
Engineering			
Engineering Campaign	2,418	2,656	2,345
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	619	500	0
Defense Nuclear Security			
Defense Nuclear Security	13,030	12,112	11,761
Readiness Campaign			
Readiness Campaign	41,466	0	0
Information technology and Cybersecurity			
Information technology and Cybersecurity	4,593	4,879	4,879
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	170,841	175,379	7,500
Secure Transportation Asset			
Secure Transportation Asset	20,260	14,415	18,351
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	18,192	18,322	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	48,642	43,495
Infrastructure and Safety			
Infrastructure and Safety	0	0	178,155
Total, Kansas City Plant	**531,900**	**574,403**	**602,867**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Kansas City Site Office			
Site Stewardship			
Site Stewardship	0	180	0
Total, Kansas City Site Office	**0**	**180**	**0**
Lawrence Berkeley National Laboratory			
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	0	5,000	0
Total, Lawrence Berkeley National Laboratory	**0**	**5,000**	**0**
Lawrence Livermore National Laboratory			
Directed Stockpile Work			
Directed Stockpile Work	115,403	124,582	173,352
Science			
Science Campaign	106,985	111,431	109,194
Site Stewardship			
Site Stewardship	25,880	25,814	500
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	14,900	0
Engineering			
Engineering Campaign	25,014	18,700	17,917
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	328,847	322,500	322,500
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	172,977	180,875	165,395
Defense Nuclear Security			
Defense Nuclear Security	57,754	53,684	53,063
Information technology and Cybersecurity			
Information technology and Cybersecurity	16,234	16,312	16,312
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	108,627	101,257	16,000
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	37,529	20,204	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	3,500	3,500
Infrastructure and Safety			
Infrastructure and Safety	0	0	120,883
Total, Lawrence Livermore National Laboratory	**995,250**	**993,759**	**998,616**
Livermore Site Office			
Site Stewardship			
Site Stewardship	0	175	0
Total, Livermore Site Office	**0**	**175**	**0**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Los Alamos National Laboratory			
Directed Stockpile Work			
Directed Stockpile Work	446,876	444,768	356,034
Science			
Science Campaign	134,812	136,365	133,185
Site Stewardship			
Site Stewardship	1,970	3,143	2,000
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	14,693	0
Engineering			
Engineering Campaign	29,290	23,712	23,975
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	14,752	15,920	16,000
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	222,522	218,656	168,901
Defense Nuclear Security			
Defense Nuclear Security	104,304	96,508	102,998
Information technology and Cybersecurity			
Information technology and Cybersecurity	15,560	16,000	16,000
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	458,653	407,383	313,888
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	41,155	23,772	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	3,000	2,500
Infrastructure and Safety			
Infrastructure and Safety	0	0	290,178
Total, Los Alamos National Laboratory	**1,469,894**	**1,403,920**	**1,425,659**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
National Energy Technology Lab			
Directed Stockpile Work			
Directed Stockpile Work	14,921	4,475	13,391
Engineering			
Engineering Campaign	1,071	754	850
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	0	107	0
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	165	0	0
Readiness Campaign			
Readiness Campaign	2,158	0	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	495	125	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	400	3,000
Total, National Energy Technology Lab	**18,810**	**5,861**	**17,241**
Naval Research Laboratory			
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	64	5,900	5,900
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	465	826	0
Infrastructure and Safety			
Infrastructure and Safety	0	0	25,000
Total, Naval Research Laboratory	**529**	**6,726**	**30,900**
Nevada Field Office			
Defense Nuclear Security			
Defense Nuclear Security	70,300	65,346	70,264
Information technology and Cybersecurity			
Information technology and Cybersecurity	3,707	3,748	3,748
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	500	0	0
Total, Nevada Field Office	**74,507**	**69,094**	**74,012**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Nevada National Security Site			
Directed Stockpile Work			
Directed Stockpile Work	39,413	38,616	40,130
Science			
Science Campaign	46,724	47,502	42,144
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	0	10	0
Defense Nuclear Security			
Defense Nuclear Security	0	0	13,000
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	147,890	133,169	22,500
Secure Transportation Asset			
Secure Transportation Asset	190	210	216
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	46,448	47,252	0
Infrastructure and Safety			
Infrastructure and Safety	0	0	127,193
Total, Nevada National Security Site	**280,665**	**266,759**	**245,183**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
NNSA Albuquerque Complex			
Directed Stockpile Work			
Directed Stockpile Work	54,409	185,090	158,544
Science			
Science Campaign	31,459	66,109	30,900
Engineering			
Engineering Campaign	0	8,428	3,635
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	25,785	23,039	9,500
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	19,141	23,000	0
Defense Nuclear Security			
Defense Nuclear Security	7,425	6,902	7,454
Information technology and Cybersecurity			
Information technology and Cybersecurity	852	3,500	3,500
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	4,075	40,390	2,000
Secure Transportation Asset			
Secure Transportation Asset	163,349	183,178	215,216
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	3,457	3,667	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	5,300	3,000
Infrastructure and Safety			
Infrastructure and Safety	0	0	2,000
Total, NNSA Albuquerque Complex	**309,952**	**548,603**	**435,749**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
NNSA Production Office (NPO)			
Directed Stockpile Work			
Directed Stockpile Work	0	520,757	699,928
Site Stewardship			
Site Stewardship	0	17,319	5,093
Engineering			
Engineering Campaign	0	4,167	4,137
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	0	250	0
Defense Nuclear Security			
Defense Nuclear Security	0	292,422	274,082
Information technology and Cybersecurity			
Information technology and Cybersecurity	0	12,455	12,455
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	0	803,402	602,102
Secure Transportation Asset			
Secure Transportation Asset	0	5,025	6,416
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	0	3,687	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	14,900	51,863
Infrastructure and Safety			
Infrastructure and Safety	0	0	357,020
Total, NNSA Production Office (NPO)	**0**	**1,674,384**	**2,013,096**
NNSA Production Site Office			
Site Stewardship			
Site Stewardship	0	200	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	0	2,987	1,000
Total, NNSA Production Site Office	**0**	**3,187**	**1,000**
Oak Ridge Institute for Science & Education			
Science			
Science Campaign	455	210	0
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	200	0
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	185	100	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	14,620	13,146	0
Total, Oak Ridge Institute for Science & Education	**15,260**	**13,656**	**0**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Oak Ridge National Laboratory			
Site Stewardship			
Site Stewardship	1,391	1,542	2,083
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	950	0
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	455	455	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	4,278	3,268	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	2,015	1,215	0
Total, Oak Ridge National Laboratory	**8,139**	**7,430**	**2,083**
Oak Ridge Office			
Domestic Uranium Enrichment RD&D			
Domestic Uranium Enrichment RD&D	105,952	97,200	0
Total, Oak Ridge Office	**105,952**	**97,200**	**0**
Office of Scientific & Technical Information			
Science			
Science Campaign	150	200	0
Information technology and Cybersecurity			
Information technology and Cybersecurity	212	213	213
Total, Office of Scientific & Technical Information	**362**	**413**	**213**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Pacific Northwest National Laboratory			
Directed Stockpile Work			
Directed Stockpile Work	10,197	16,200	18,880
Science			
Science Campaign	526	0	0
Site Stewardship			
Site Stewardship	50	827	0
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	50	0
Engineering			
Engineering Campaign	527	643	0
Readiness Campaign			
Readiness Campaign	82	0	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	0	40	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	3,195	2,905	0
Infrastructure and Safety			
Infrastructure and Safety	0	0	3,000
Total, Pacific Northwest National Laboratory	**14,577**	**20,665**	**21,880**
Pantex Plant			
Directed Stockpile Work			
Directed Stockpile Work	238,912	0	0
Site Stewardship			
Site Stewardship	15,475	0	0
Engineering			
Engineering Campaign	2,222	0	0
Defense Nuclear Security			
Defense Nuclear Security	128,329	0	0
Information technology and Cybersecurity			
Information technology and Cybersecurity	6,264	0	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	199,525	0	0
Secure Transportation Asset			
Secure Transportation Asset	5,479	0	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	1,817	0	0
Total, Pantex Plant	**598,023**	**0**	**0**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Pantex Site Office			
Readiness Campaign			
Readiness Campaign	500	0	0
Total, Pantex Site Office	**500**	**0**	**0**
Richland Operations Office			
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	105	0	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	1,473	1,550	0
Total, Richland Operations Office	**1,578**	**1,550**	**0**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Sandia National Laboratories			
Directed Stockpile Work			
Directed Stockpile Work	855,278	909,993	902,356
Science			
Science Campaign	31,685	39,050	38,238
Site Stewardship			
Site Stewardship	6,233	7,002	500
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	10,500	0
Engineering			
Engineering Campaign	81,891	73,615	73,089
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	48,743	44,640	44,540
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	132,934	142,609	142,609
Defense Nuclear Security			
Defense Nuclear Security	65,227	60,631	59,528
Readiness Campaign			
Readiness Campaign	8,284	0	0
Information technology and Cybersecurity			
Information technology and Cybersecurity	16,180	16,740	16,740
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	166,492	149,583	39,500
Secure Transportation Asset			
Secure Transportation Asset	16,303	16,172	11,411
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	35,604	24,058	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	11,400	10,880
Infrastructure and Safety			
Infrastructure and Safety	0	0	135,300
Total, Sandia National Laboratories	**1,464,854**	**1,505,993**	**1,474,691**
Savannah River Operations Office			
Directed Stockpile Work			
Directed Stockpile Work	841	1,629	52
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	100	0
Total, Savannah River Operations Office	**841**	**1,729**	**52**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Savannah River Site			
Directed Stockpile Work			
Directed Stockpile Work	73,155	98,578	91,639
Site Stewardship			
Site Stewardship	604	980	3,459
Engineering			
Engineering Campaign	1,820	1,550	198
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	174	0	0
Defense Nuclear Security			
Defense Nuclear Security	7,970	7,408	6,894
Information technology and Cybersecurity			
Information technology and Cybersecurity	4,592	5,193	5,193
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	134,268	122,579	20,056
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	2,594	3,154	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	5,300	6,450
Infrastructure and Safety			
Infrastructure and Safety	0	0	109,095
Total, Savannah River Site	**225,177**	**244,742**	**242,984**
Savannah River Site Office			
Engineering			
Engineering Campaign	0	0	1,192
Readiness Campaign			
Readiness Campaign	1,734	0	0
Total, Savannah River Site Office	**1,734**	**0**	**1,192**
SLAC National Accelerator Laboratory			
Science			
Science Campaign	920	1,800	0
Total, SLAC National Accelerator Laboratory	**920**	**1,800**	**0**
University of Rochester			
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	63,185	66,500	60,500
Total, University of Rochester	**63,185**	**66,500**	**60,500**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Washington Headquarters			
Directed Stockpile Work			
Directed Stockpile Work	44,251	54,136	394,264
Science			
Science Campaign	11,528	8,324	35,953
Site Stewardship			
Site Stewardship	25,834	13,050	21,975
Counterterrorism and Counterproliferation Programs			
Counterterrorism and Counterproliferation Programs	0	4,500	0
Engineering			
Engineering Campaign	2,695	1,780	4,039
Inertial Confinement Fusion Ignition High Yield			
Inertial Confinement Fusion Ignition High Yield Campaign	13,170	11,149	20,010
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	17,581	26,155	146,101
Defense Nuclear Security			
Defense Nuclear Security	26,770	41,110	33,847
Readiness Campaign			
Readiness Campaign	981	0	0
Legacy Contractor Pensions			
Legacy Contractor Pensions	335,490	307,058	283,887
Information technology and Cybersecurity			
Information technology and Cybersecurity	68,796	100,606	78,548
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	7,200	92,092	29,935
Secure Transportation Asset			
Secure Transportation Asset	4,400	0	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	10,117	7,440	0
Advanced Manufacturing Development			
Advanced Manufacturing Development	0	14,658	5,368
Infrastructure and Safety			
Infrastructure and Safety	0	0	118,310
Total, Washington Headquarters	**568,813**	**682,058**	**1,172,237**
Waste Isolation Pilot Plant			
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	56	61	0
Total, Waste Isolation Pilot Plant	**56**	**61**	**0**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Weapons Activities	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Y-12 National Security Complex			
Directed Stockpile Work			
Directed Stockpile Work	278,959	0	0
Site Stewardship			
Site Stewardship	4,684	0	0
Engineering			
Engineering Campaign	2,650	0	0
Advanced Simulation & Computing			
Advanced Simulation & Computing Campaign	239	0	0
Information technology and Cybersecurity			
Information technology and Cybersecurity	7,452	0	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	651,975	0	0
Secure Transportation Asset			
Secure Transportation Asset	19	0	0
Nuclear Counterterrorism Incident Response			
Nuclear Counterterrorism Incident Response	1,073	0	0
Total, Y-12 National Security Complex	**947,051**	**0**	**0**
Y-12 Site Office			
Defense Nuclear Security			
Defense Nuclear Security	178,034	0	0
Readiness in Technical Base and Facilities			
Readiness in Technical Base and Facilities	3,587	0	0
Total, Y-12 Site Office	**181,621**	**0**	**0**
Total, Weapons Activities	**7,914,825**	**8,231,770**	**8,846,948**

Defense Nuclear Nonproliferation

Defense Nuclear Nonproliferation

FY 2015 Congressional Budget Request

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 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, [$1,641,369,000] *$1,940,302,000*, to remain available until expended. [: *Provided*, That funds provided by this Act for Project 99-D-143, Mixed Oxide Fuel Fabrication Facility, and by prior Acts that remain unobligated for such Project, may be made available only for construction and program support activities for such Project: *Provided further*, That of the unobligated balances from prior year appropriations available under this heading, $24,731,000 is hereby rescinded: *Provided further*, That no amounts may be rescinded from amounts that were designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or the Balanced Budget and Emergency Deficit Control Act of 1985].

Explanation of Change

Change from FY 2015 reflects the proposed transfer of the Nuclear Counterterrorism Incident Response (NCTIR) and the Counterterrorism and Counterproliferation (CTCP) Programs from the Weapons Activities to the Defense Nuclear Nonproliferation (DNN) appropriation. Further, the Request proposes to combine the NCTIR and CTCP programs to eliminate confusion about NNSA nuclear counterterrorism programs and activities, and to change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program. These transfers align all NNSA funding for reducing global nuclear dangers in one appropriation. The DNN Appropriation will support two enduring mission areas: 1) Defense Nuclear Nonproliferation and 2) Nuclear Counterterrorism and Incident Response (NCTIR). Additionally, the Request reflects the realignment of budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation R&D.

Public Law Authorizations

- P.L. 106-65, National Nuclear Security Administration Act, as amended
- P.L. 113-291, National Defense Authorization Act for Fiscal Year 2015

Defense Nuclear Nonproliferation

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Defense Nuclear Nonproliferation	1,954,000	1,941,983	1,641,369	1,940,302
Rescission of Prior Year Balances	0	0	-26,121	0
Total DNN, Net of Rescissions	**1,954,000**	**1,941,983**	**1,615,248**	**1,940,302**

Overview

In FY 2016, NNSA proposes to fund two mission areas under the Defense Nuclear Nonproliferation appropriation: 1) the Defense Nuclear Nonproliferation Program and 2) the Nuclear Counterterrorism and Incident Response (NCTIR) Program. NCTIR and the Counterterrorism and Counter Proliferation (CTCP) programs were previously funded under the Weapons Activities appropriation. This move aligns all NNSA funding for preventing, countering and responding to global nuclear dangers in one appropriation, and strengthens existing collaborations and shared missions between the two mission areas and clarifies total funding and work scope dedicated to counterterrorism.

Additionally, the FY 2016 proposal reflects the realignment of budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation R&D. Detailed crosswalks between the old structure and new structure can be found below.

Together these programs execute key elements of NNSA's enduring mission: to provide policy and technical leadership to prevent or limit the spread of materials, technology, and expertise relating to weapons of mass destruction; advance technologies that detect the proliferation of weapons of mass destruction worldwide; eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons; provide a technically trained response to incidents worldwide; and address the danger that hostile nations or terrorist groups may acquire nuclear devices and weapons-usable material, dual-use production technology, or nuclear-related weapons of mass destruction expertise. This proposed realignment presents with greater clarity the total funding and level of activity undertaken by NNSA in this increasingly important area. Similarly, this realignment focuses the Weapons Activities appropriation on those activities required to maintain a safe, secure, and effective U.S. nuclear weapons stockpile.

The Defense Nuclear Nonproliferation (DNN) appropriation includes funding for activities that implement the National Security Strategy of the United States, and are central to the Department of Energy's (DOE) pursuit of its strategic goal of Nuclear Security, playing a critical role in meeting DOE's Strategic Objective 6 to reduce global nuclear security threats. DNN leads U.S. Government (USG) efforts to develop and implement programs that limit or prevent the spread of nuclear and radiological materials and associated technology and expertise; to advance technologies that detect nuclear and radiological proliferation worldwide; to eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons; to provide worldwide nuclear and radiological emergency response capabilities; and to advance USG counterterrorism and counterproliferation goals through innovative science, technology, and policy-driven solutions. DNN participates in a whole-of-government policy process by formulating options and evaluating alternatives.

This mission is implemented by drawing broadly on the scientific and technical expertise of DOE, as well as the capacity for international outreach, engagement and project management, implementation, and policy expertise. In addition, DNN draws upon the core competencies of other elements of NNSA and DOE, particularly the Office of Nuclear Energy, the Office of Environmental Management, and the Office of Science.

This mission is carried out in a dynamic global security environment characterized by the persistence and escalation of regional conflicts, continued diffusion of dual-use technology and information, continued expansion of civilian nuclear energy, ongoing challenges related to managing existing nuclear and other radiological materials, increased sophistication of trafficking networks, continued evidence of terrorist interest in procuring nuclear materials, challenges to the nonproliferation regime, and the growth of cyber threats that can directly affect nuclear safeguards and security.

DNN is a strong contributor to interagency and international nuclear security efforts. In the United States, DNN works in partnership with other USG agencies, most notably the Department of State, the Department of Defense, and the Nuclear Regulatory Commission. Internationally, DNN has a strong and long-established partnership with the International Atomic Energy Agency (IAEA) and has active bilateral program coordination, as well as multilateral program coordination consultations, through forums such as the Nuclear Security Summit, the Global Initiative to Combat Nuclear Terrorism, and the Global Partnership against the Spread of Weapons and Materials of Mass Destruction.

The U.S. remains committed to the plutonium disposition mission and to the Plutonium Management and Disposition Agreement (PMDA) with Russia. The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the PMDA. The Department has requested Aerospace Corporation, a federally funded research and development facility, to perform these analyses. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition. The request acknowledges that while the Department continues to evaluate disposition paths (including the Mixed Oxide Fuel Fabrication Facility) to determine the most responsible path forward, any viable alternative will require a robust funding profile.

DNN will develop technical detection capabilities that address current and projected threats to national security posed by the proliferation of nuclear weapons and diversion of special nuclear material and contribute substantially to the success of international nuclear treaties and agreements by having the technical means and policy context to support negotiations and detect non-compliance.

The FY 2016 Request proposes to combine the NCTIR and CTCP programs to eliminate confusion about NNSA nuclear counterterrorism programs and activities, and to change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program. The program strategically manages and deploys expert scientific teams and equipment to provide a technically trained, rapid response to nuclear or radiological incidents and accidents worldwide. NCTIR evaluates and assesses nuclear or radiological threats, and leverages that knowledge to provide interagency policy and contingency planning, training and support to national and international counterterrorism, counterproliferation, and incident response capabilities. Finally, NCTIR also executes the DOE's Emergency Management and Operations Support program that manages the Emergency Operations Centers, Emergency Communications Network and COOP activities.

Highlights and Major Changes in the FY 2016 Budget Request

The DNN FY 2016 budget request supports the following key priorities:

- Continues remaining high-priority nuclear and radiological threat reduction efforts, following the accelerated four-year effort activities;
- Provides IAEA with critical mission support and strengthens international nuclear safeguards system;
- Provides funding to address urgent emerging threats in unstable regions, particularly the Middle East.
- Advances satellite payload activities that support treaty monitoring and military missions;
- Sustains radiological/nuclear device stabilization capabilities in nine cities including providing technical equipment and training;
- Continues Emergency Communications Network Suite upgrades to maintain state of art capabilities.

Major Outyear Priorities and Assumptions

Outyear funding levels for the Defense Nuclear Nonproliferation appropriation total $9,038,817 for FY 2017 through FY 2020, based on the following priorities and assumptions:

DNN will continue to play a key role in the international effort to secure vulnerable nuclear materials around the world, prevent illicit trafficking, and support commitments made by the United States and international partners at the 2010, 2012, 2014 and 2016 Nuclear Security Summits.

DNN will continue the remaining high-priority nuclear and radiological threat reduction efforts following the accelerated four-year effort activities, continue cooperative work with international partners, such as the Global Partnership and Global Initiative to Combat Nuclear Terrorism, and implement an engagement strategy with partner countries that carefully balances threat and indigenous resources. This budget also assumes that Russia will take on increasing responsibility for conversion/shutdown of its HEU-fueled research reactors.

DNN will continue to reduce nuclear danger through field experimentation and research spirals in nuclear nonproliferation, test monitoring, arms control, and threat reduction for meeting the Administration's nuclear nonproliferation and arms control goals. DNN will also contribute to the nation's space based global nuclear detonation detection capability as required by law.

The network of nuclear security centers of excellence that resulted from the 2010, 2012, and 2014 Nuclear Security Summits will continue. DNN will continue to support technical engagement on nuclear security for expanded dialogue with China, India, and other countries. DNN will also continue to engage internationally in efforts to prevent the proliferation of nuclear expertise. This includes contributing to topical training and curriculum development with international implementing partners to enhance existing programs. These activities support the agenda on expertise security that has been advanced by the Nuclear Security Summit process.

DNN will continue to build capacity to prevent illicit trafficking in nuclear and radiological materials. To this end, DNN will continue to deploy fixed radiation detection capabilities to address remaining gaps in in the Global Nuclear Detection Architecture (GNDA), expand mobile detection efforts and cooperation with law enforcement agencies, and continue emphasis on sustainability of deployed systems.

NCTIR will maintain and strengthen its nuclear/radiological incident response capabilities, its Emergency Operations Center, and the Department's capabilities to manage accidents and emergencies at its operating locations. Priorities include sustainment of existing deployable capabilities, understanding and adapting to changes in proliferation and nuclear terrorism threats, and sustaining unique modeling and device assessment capabilities. NCTIR will also support bilateral counterterrorism security dialogues with advanced civil nuclear partner countries and capability development of nuclear incident response and WMD counterterrorism capabilities, domestically and with key international partners.

FY 2014 Key Accomplishments

- Continued to advance the President's Initiative to remove and eliminate vulnerable excess nuclear and radioactive materials, and to minimize the civilian use of highly enriched uranium (HEU) by:
  - Completing the major goals of the 1993 U.S-Russia Highly Enriched Uranium (HEU) Purchase Agreement: 500 metric tons of weapons-origin HEU was downblended to low enriched uranium (LEU) and all resulting LEU was delivered to the United States where the LEU will continue to produce ten percent of all electricity produced annually until 2019.
  - Removing or confirming the disposition of an additional 190 kilograms of HEU and plutonium in FY 2014 for a cumulative total of 5,207 kilograms of HEU and plutonium.
  - Supporting the downblending of approximately 0.5 metric tons (MT) of Russian, excess weapons usable (non-weapons origin) HEU to LEU, for a cumulative total of 16.8MT.
  - Completing the 12.1 MT of HEU down-blending for the MOX back-up LEU inventory and down-blended 2.9 MT of the 5 MT contract extension. This completes the 146 MT cumulative amount of surplus U.S. highly enriched uranium (HEU) down-blended or shipped for down-blending.
  - Producing plutonium oxide at Los Alamos National Laboratory (LANL) and HB-Line at Savannah River as feedstock for the U.S. plutonium disposition program.

- Prevented the illicit trafficking of nuclear and radiological materials, technology and expertise by:
  - Deploying fixed radiation equipment to 37 high priority sites and providing 22 additional mobile and man-portable systems for use by border security at green borders and law enforcement at internal checkpoints. In addition to the equipment deployed, more than 60 sites were transitioned to indigenous sustainability.
  - Concluding negotiations and entering into force three civil nuclear cooperation agreements (123 Agreements) with Vietnam, Taiwan, and the IAEA; conducting 32 international workshops and assessments related to nuclear safeguards and physical protection; performing over 5,600 technical reviews of U.S. export licenses and requests

to support legitimate trade in dual-use goods; and completing nearly 3,000 technical analyses supporting detection and interdiction of WMD-related commodity transfers to foreign programs of concern.

- Enhanced U.S. ability to monitor arms control treaties and detect foreign nuclear programs by:
  - Delivering the second Space and Atmospheric Burst Reporting System (SABRS-2) payload for integration on a host satellite and supporting the Air Force Space and Missile Systems Center with the launch and on-orbit testing of two Global Burst Detector Payloads on two separate Global Positioning System (GPS) IIF satellites.
  - Achieving full operational status and successful execution of two test campaigns of a joint, NNSA and DTRA-developed nonproliferation test bed, which is leveraged by 10 interagency partners, and provides an experimental framework for developing innovative material production monitoring capabilities.

- Increased the domestic and international security of radiological sources by:
  - Completing security upgrades at a cumulative total of 1,816 buildings worldwide with high-priority radiological sources.
  - Recovering more than 2,000 radioactive sources from location in the U.S., resulting in the cumulative total of more than 37,000 sources removed.

- Negotiating and signing a new bilateral nuclear security agreement and a new Agreement on Cooperation in Nuclear- and Energy-Related Scientific Research and Development with the Russian Federation.

- Supporting two IAEA international training courses on identification and prevention of the insider threat to nuclear material (India, Japan).

- Maintaining organizational readiness to respond to and mitigate radiological or nuclear incidents worldwide

Department of Energy (DOE) Working Capital Fund (WCF) Support
The NNSA Defense Nuclear Nonproliferation appropriation projected contribution to the DOE Working Capital Fund for FY 2016 is $6,145,000. This funding covers certain shared enterprise activities including managing enterprise-wide systems and data, telecommunications and supporting the integrated acquisition environment.

Legacy Contractor Pensions
This funding provides the annual DNN share of the Department of reimbursement of payments made to the University of California Retirement Plan (UCRP) for former University of California employees and annuitants who worked at the Lawrence Livermore National Laboratory (LLNL) and LANL. The UCRP benefit for these individuals is a legacy cost and DOE's annual payment to the University of California is required by contracts. The amount of the annual payment is based on the actuarial valuation report and is covered by the terms described in the Appendix T section of the contracts. Funding for these contracts will be paid through the Legacy Contractor Pension line.

NNSA Graduate Fellowship Program (NGFP) Support
The NNSA manages a technical fellowship program to cultivate the next generation of future leaders in nonproliferation, nuclear security, and international security to create a pipeline of highly qualified professionals who will sustain expertise in these areas through future employment within the nuclear security enterprise. The majority of these efforts directly support program activities, and programs funded in the DNN appropriation plan totaling up to approximately $3,000,000 in FY 2016, in areas including international nuclear security relations, global threat reduction, fissile materials disposition, and international material protection and cooperation.

Defense Nuclear Nonproliferation
Funding by Congressional Control
(Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Defense Nuclear Nonproliferation Appropriation					
Defense Nuclear Nonproliferation					
Material Management and Minimization	**0**	**0**	**0**	**311,584**	**+311,584**
Global Material Security	**0**	**0**	**0**	**426,751**	**+426,751**
Nonproliferation and Arms Control	**0**	**0**	**0**	**126,703**	**+126,703**
Defense Nuclear Nonproliferation R&D	**0**	**0**	**393,401**	**419,333**	**+25,932**
Nonproliferation and Verification R&D	**398,838**	**461,125**	**0**	**0**	**+0**
Nonproliferation Construction					
99-D-143 Mixed Oxide (MOX) Fuel Fabrication Facility, SRS	**0**	**0**	**0**	**345,000**	**+345,000**
Total, Nonproliferation Construction	**0**	**0**	**0**	**345,000**	**+345,000**
Global Threat Reduction Initiative					
Highly Enriched Uranium (HEU) Reactor Conversion	**162,000**	**161,648**	**119,383**	**0**	**-119,383**
International Nuclear and Radiological Material Removal and Protection	**200,102**	**199,960**	**117,737**	**0**	**-117,737**
Domestic Radiological Material Removal and Protection	**80,000**	**79,829**	**88,632**	**0**	**-88,632**
International Contributions	**0**	**3,161**	**0**	**0**	**0**
Total, Global Threat Reduction Initiative	**442,102**	**444,598**	**325,752**	**0**	**-325,752**
Nonproliferation and International Security	**128,675**	**135,481**	**141,359**	**0**	**-141,359**
International Material Protection and Cooperation	**419,625**	**415,091**	**270,911**	**0**	**-270,911**
Fissile Materials Disposition (FMD)					
U.S. Surplus FMD (Operations and Maintenance)					
U.S. Plutonium Disposition	**157,557**	**155,057**	**60,000**	**0**	**-60,000**
U.S. Uranium Disposition	**25,000**	**27,500**	**25,000**	**0**	**-25,000**
Subtotal, U.S. Surplus FMD Operations and Maintenance	**182,557**	**182,557**	**85,000**	**0**	**-85,000**
Construction	**343,500**	**402,743**	**345,000**	**0**	**-345,000**
Total, U.S. Surplus Fissile Materials Disposition	**526,057**	**585,300**	**430,000**	**0**	**-430,000**

	(Dollars in Thousands)				
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Russian Surplus Fissile Materials Disposition	**0**	**0**	**0**	**0**	**0**
Total, Fissile Materials Disposition	**526,057**	**585,300**	**430,000**	**0**	**-430,000**
Total, Defense Nuclear Nonproliferation Programs	**1,915,297**	**2,041,595**	**1,561,423**	**1,629,371**	**+67,948**
Nuclear Counterterrorism and Incident Response Program	**0**	**0**	**0**	**234,390**	**+234,390**
Legacy Contractor Pensions	**93,703**	**116,556**	**102,909**	**94,617**	**-8,292**
Subtotal, Defense Nuclear Nonproliferation Appropriation	**2,009,000**	**2,158,151**	**1,664,332**	**1,958,378**	**294,046**
Use of Prior Year Balances	**-55,000**	**-216,168**	**-22,963**	**-18,076**	**4,887**
Recission of Prior Year Balances	**0**	**0**	**-26,121**	**0**	**26,121**
Total, Defense Nuclear Nonproliferation Appropriation	**1,954,000**	**1,941,983**	**1,615,248**	**1,940,302**	**325,054**

The proposed Use of Prior Year Balances for FY 2016 includes $17,500,000 in prior year funding from Russia-related nonproliferation activities and $576,000 from funds set aside to meet the apportionment restriction related to NNSA pension funding.

SBIR/STTR:

- FY 2014 Transferred: SBIR: $6,975; STTR: $997
- FY 2015 Projected: SBIR: $6,223; STTR: $860
- FY 2016 Projected: SBIR: $6,784; STTR: $1,018

Defense Nuclear Nonproliferation
Funding
(Comparable)

Defense Nuclear Nonproliferation Funding
(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Global Material Security	572,358	571,646	424,244	426,751	+2,507
Material Management and Minimization	422,159	421,565	272,919	311,584	+38,665
Nonproliferation and Arms Control	118,442	124,516	125,859	126,703	+844
Defense Nuclear Nonproliferation R&D	398,838	461,125	393,401	419,333	+25,932
Nonproliferation Construction	403,500	462,743	345,000	345,000	0
Legacy Contractor Pensions	93,703	116,556	102,909	94,617	-8,292
Nuclear Counterterrorism and Incident Response	228,243	228,521	224,033	234,390	+10,357
Subtotal	2,237,243	2,386,672	1,888,365	1,958,378	+70,013
Use of Prior Year Balances	(55,000)	(216,168)	(22,963)	(18,076)	+4,887
Rescissions	0	0	(26,121)	0	+26,121
TOTAL	2,182,243	2,170,504	1,839,281	1,940,302	+101,021

	Proposed FY 2016 Budget Structure							
FY 2015 Budget Structure	Global Material Security	Material Management and Minimization	Nonproliferation and Arms Control	DNN R&D	Nonproliferation Construction	Nuclear Counterterrorism and Incident Response	Legacy Contractor Pensions	Total
Global Threat Reduction Initiative								
HEU Reactor Conversion	0	115,000	0	0	0	0	0	**115,000**
International Nuclear and Radiological Material Removal and Protection	61,156	114,000	0	0	0	0	0	**175,156**
Domestic Radiological Material Removal and Protection	92,593	0	0	0	0	0	0	**92,593**
DNN R&D	0	0	0	419,333	0	0	0	**419,333**
Nonproliferation and International Security	12,421	0	126,703	0	0	0	0	**139,124**
International Material Protection and Cooperation	260,581	0	0	0	0	0	0	**260,581**
Fissile Materials Disposition								
U.S. Plutonium Disposition	0	50,504	0	0	0	0	0	**50,504**
U.S. Uranium Disposition	0	31,080	0	0	0	0	0	**31,080**
Construction								
99-D-143 MOX Fuel Fabrication Facility (MFFF)	0	0	0	0	345,000	0	0	**345,000**
Russian Surplus Fissile Material Disposition	0	1,000 [a]	0					**1,000**
Total, Defense Nuclear Nonproliferation Programs	**426,751**	**310,584**	**126,703**	**419,333**	**345,000**	**0**	**0**	**1,629,371**
Nuclear Counterterrorism Incident Response	0	0	0	0	0	**175,101**	0	**175,101**
Counterterrorism and Counterproliferation Programs	**0**	**0**	**0**	0	**0**	**59,289**	0	**59,289**
Legacy Contractor Pensions	0	0	0	0	0	0	**94,617**	**94,617**
Use of Prior Year Balances	0	0	0	0	0	0	**0**	**(18,076)**
Total	**426,751**	**311,584**	**126,703**	**419,333**	**345,000**	**234,390**	**94,617**	**1,940,302**

[a] In FY 2016, NNSA is proposing to rename this activity to "International Plutonium Disposition."

Outyears for Defense Nuclear Nonproliferation

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Defense Nuclear Nonproliferation Appropriation				
Defense Nuclear Nonproliferation				
Global Material Security	**534,263**	**543,665**	**552,122**	**580,363**
Material Management and Minimization	**315,463**	**337,593**	**348,494**	**344,490**
Nonproliferation and Arms Control	**131,305**	**140,726**	**144,033**	**146,909**
Defense Nuclear Nonproliferation R&D	**430,202**	**440,174**	**448,047**	**456,583**
Nonproliferation Construction				
99-D-143 Mixed Oxide (MOX) Fuel Fabrication Facility, SRS	**221,000**	**221,000**	**221,000**	**221,000**
Total, Nonproliferation Construction	**221,000**	**221,000**	**221,000**	**221,000**
Total, Defense Nuclear Nonproliferation Programs	**1,632,233**	**1,683,158**	**1,713,696**	**1,749,345**
Nuclear Counterterrorism and Incident Response Program	**241,754**	**239,518**	**239,613**	**243,060**
Legacy Contractor Pensions	**69,208**	**52,640**	**29,296**	**29,296**
Subtotal, Defense Nuclear Appropriation	**1,943,195**	**1,975,316**	**1,982,605**	**2,021,701**
Use of Prior Year Balances	**0**	**0**	**0**	**0**
Recission of Prior Year Balances	**0**	**0**	**0**	**0**
Total, Defense Nuclear Nonproliferation Appropriation	**1,943,195**	**1,975,316**	**1,982,605**	**2,021,701**

SBIR/STTR:

- FY 2017 Request: SBIR: $7,434; STTR: $1,045
- FY 2018 Request: SBIR: $7,610; STTR: $1,070
- FY 2019 Request: SBIR: $7,733; STTR: $1,087
- FY 2020 Request: SBIR: $7,902; STTR: $1,111

Defense Nuclear Nonproliferation
Research and Development[a]

The Office of Management and Budget (OMB) Circular No. A-11, "Preparation, Submission, and Execution of the Budget," dated July 2013, requires the reporting of research and development (R&D) data. Consistent with this requirement, R&D activities funded by NNSA are displayed below.

(Dollars in Thousands)

	FY 2014[a] Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Research and Development (R&D)				
Basic	59,960	46,877	49,316	+2,439
Applied	162,182	126,795	133,392	+6,597
Development	52,782	41,265	43,412	+2,147
Subtotal, R&D	**274,924**	**214,937**	**226,120**	**+11,183**
Equipment	0	0	0	0
Construction	0	0	0	0
Total, R&D	**274,924**	**214,937**	**226,120**	**+11,183**

[a] Funding reflects the SBIR/STTR amounts transferred to the Office of Science.

Global Material Security

Overview

NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation Research and Development (R&D). The Global Material Security (GMS) FY 2016 Budget Request highlights the critical importance of first and second lines of defense to prevent the most vulnerable nuclear material and highest activity radiological material from falling into the wrong hands. This request supports national security priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, both of which are reflected in the Department of Energy (DOE) Strategic Plan. These priorities include the efforts to secure or eliminate the world's most vulnerable nuclear weapon materials; dispose of excess nuclear weapon materials in the United States; support the development of new technologies for nonproliferation; promote the secure expansion of nuclear energy; and improve capabilities worldwide to deter and detect the illicit trafficking of nuclear and radiological materials.

The GMS program directly contributes to meeting the DOE strategic goal for "Nuclear Security" and plays a critical role in meeting Strategic Objective 6 to reduce global nuclear security threats. GMS supports the Secretary's goal of enhancing nuclear security through defense, nonproliferation, and environmental efforts by working with partner countries to increase the security of vulnerable stockpiles of nuclear weapons, weapons-usable nuclear materials, and radiological materials and to improve partner countries' abilities to deter, detect, and interdict illicit trafficking.

GMS consists of three subprograms: International Nuclear Security, Radiological Security, and Nuclear Smuggling Detection and Deterrence.

The International Nuclear Security (INS) subprogram serves as a first line of defense against nuclear terrorism by working with partner countries to improve the security of nuclear material in place and during transport. It provides nuclear material protection control and accounting (MPC&A) upgrades and related training and assists in strengthening MPC&A regulations, inspections, and nuclear security culture. It also provides support for nuclear security practitioners through best practice technical exchanges as well as development of Nuclear Security Training Centers of Excellence.

The Radiological Security subprogram secures materials in use, at their source and recovers orphaned or disused radiological sources, both domestically and abroad. The Radiological Security subprogram also works at the national and site levels to ensure that protection is sustained over the lifecycle of these sources and encourages source users to utilize non-isotopic technologies, where feasible.

The Nuclear Smuggling Detection and Deterrence (NSDD) subprogram, formerly the Second Line of Defense (SLD) Program, strengthens the capacity and commitment of foreign governments to deter, detect, and interdict illicit trafficking in nuclear and other radioactive materials across and within international borders and through the global maritime shipping system. NSDD's strategy is to improve partner countries' capacity by providing fixed and mobile radiation detection systems and associated training, maintenance, and sustainability support. NSDD deploys its systems at carefully selected locations as part of the broader USG layered, defense-in-depth approach to countering nuclear trafficking. NSDD works with the International Atomic Energy Agency (IAEA), the European Union, Interpol, and other organizations to facilitate coordination and consistency in efforts to counter nuclear smuggling. NSDD also works to strengthen foreign partner nuclear forensics analytical capability and best practices, which are integral to a robust program to deter illicit trafficking.

In the long term, each partner country must be able to sustain its ability to secure, reduce, and interdict nuclear and radioactive materials. Therefore, the GMS program focuses on sustainability by helping to improve indigenous nuclear security infrastructure at the site and national levels to include support in enhancing areas such as regulations and inspections, transportation security, training, maintenance, performance testing, life-cycle planning, and nuclear security culture.

Additionally, GMS provides technical and policy support to multilateral organizations, including support for the International Atomic Energy Agency's (IAEA) development of nuclear security guidance and associated curricula, conduct of

training workshops, International Physical Protection Advisory Service (IPPAS) missions, and technical and other consultancies. GMS also works bilaterally to train foreign partners on IAEA INFCIRC 225/Revision 5 physical protection and nuclear security recommendations and knowledge security best practices.

Highlights of the FY 2016 Budget Request

- Support joint development and execution of nuclear security best practices training courses at the India, Japan, South Korea and China Centers of Excellence (COEs); the COEs will address domestic nuclear security training requirements as well as provide a forum for bilateral and regional best practice exchanges. The China COE, which will be complete in the first quarter of FY 2016, will also serve as a venue for demonstrating advanced technologies related to nuclear security.
- Continue to fund curriculum development for the national nuclear training centers in Kazakhstan and Abu Dhabi.
- Continue to support best practices exchanges with Belarus, India, Israel, and other international partners.
- Deploy 16 mobile radiation detection systems and provide fixed systems to 24 new sites to help counter the threat of illicit trafficking of special nuclear material; the bulk of these systems will be deployed in the Former Soviet Union, the Middle East, and Africa.
- Complete upgrades at an additional 137 buildings with high-priority radioactive sources (95 domestic sites and 42 international sites).
- Recover an additional 1,850 disused and unwanted radioactive sealed sources from sites located throughout the United States.
- Promote long-term risk reduction through replacing radiological source-based devices in the United States with non-isotopic technologies.

Major Outyear Priorities and Assumptions

Outyear funding levels for GMS will total $2,210,413,000 for FY 2017 through FY 2020. GMS will continue to work with international partners to enhance nuclear security both bilaterally and through appropriate multilateral forums, such as the G7 Global Partnership against the Spread of Weapons and Materials of Mass Destruction and the growing network of Nuclear Security Centers of Excellence. GMS will support the further development of nuclear security Centers of Excellence in China India, Japan, and South Korea, as well as national training centers in Kazakhstan and Abu Dhabi, to expand nuclear security best practices training and technical capabilities in those partner countries.

Given the size of Russia's material stockpiles, GMS will continue to look for partnership opportunities with Russia, on the general assumption that each side shall independently bear its costs related to cooperative activities. The goal of these activities would be to further enhance global nuclear security best practices and radiological security.

The Nuclear Smuggling Detection and Deterrence (NSDD) component of GMS will complete identified international nuclear detection fixed deployments, expand mobile detection initiatives, and maintain sustainability programs consistent with the strategies identified in the interagency Global Nuclear Detection Architecture Implementation Plan; and support the expansion of nuclear forensics capabilities.

GMS will also work in countries around the world to implement radiological threat reduction. By the end of FY 2020, GMS will have protected 2,649 buildings with high-priority radiological materials both domestically and abroad. Through this process, GMS will also strive to replace high activity radiological devices with non-isotopic technologies, thus creating permanent threat reduction and eliminating the need for sustainment of security upgrades.

Global Material Security
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Global Material Security					
International Nuclear Security	**0**	**0**	**0**	**130,527**	**+130,527**
Radiological Security	**0**	**0**	**0**	**153,749**	**+153,749**
Nuclear Smuggling Detection and Deterrence	**0**	**0**	**0**	**142,475**	**+142,475**
International Contributions [a]	**0**	**0**	**0**	**0**	**0**
Total, Global Material Security	**0**	**0**	**0**	**426,751**	**+426,751**

Global Material Security
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Global Material Security					
International Nuclear Security	**227,966**	**150,192**	**134,875**	**130,527**	**-4,348**
Radiological Security	**152,000**	**151,829**	**137,833**	**153,749**	**+15,916**
Nuclear Smuggling Detection and Deterrence	**192,392**	**264,751**	**151,536**	**142,475**	**-9,061**
International Contributions [a]	**0**	**4,874**	**0**	**0**	**0**
Total, Global Material Security	**572,358**	**571,646**	**424,244**	**426,751**	**+2,507**

[a] The FY 2014 total includes international contributions of $459,000 from Finland, $998,000 from United Kingdom and $500,000 from the Netherlands for International Radiological Material Removal; and $200,000 from S. Korea, $2,461,000 from United Kingdom and $255,810 from New Zealand for International Material Protection.

Outyears for Global Material Security
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Global Material Security				
International Nuclear Security	**211,183**	**172,263**	**165,451**	**169,226**
Radiological Security	**180,678**	**218,891**	**249,089**	**270,273**
Nuclear Smuggling Detection and Deterrence	**142,402**	**152,511**	**137,582**	**140,864**
International Contribtions	**0**	**0**	**0**	**0**
Total, Global Material Security	**534,263**	**543,665**	**552,122**	**580,363**

Global Material Security
Proposed Budget Structure Changes

The FY 2015 Consolidated Appropriations Act funded Defense Nuclear Nonproliferation (DNN) Activities under five programs. In FY 2016, NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation R&D.

In FY 2016, elements of the former Global Threat Reduction Initiative program are to be integrated into the Global Material Security program. These include: International Radiological Material Removal; Domestic Radiological Material Removal; International Radiological Material Protection; and Domestic Radiological Material Protection. Also, International Nuclear Forensics, previously under Nonproliferation and Arms Control, will be integrated with GMS' Nuclear Smuggling Detection and Deterrence Program.

Budget Structure Crosswalk[a]
(Dollars in Thousands)

	FY 2016 Budget Structure for Global Material Security			
	International Nuclear Security	Radiological Security	Nuclear Smuggling Detection and Deterrence	Total
FY 2015 Budget Structure				
International Materials Protection and Cooperation				
Weapons Materials Protection	166	0	0	**166**
Material Consolidation and Civilian Sites	116,570	0	0	**116,570**
National Infrastructure and Sustainability	1,370	0	0	**1,370**
Second Line of Defense	0	0	142,475	**142,475**
Total, International Materials Protection and Cooperation	**118,106**	**0**	**142,475**	**260,581**
Global Threat Reduction Initiative				
International Radiological Material Removal	0	3,000	0	**3,000**
Domestic Radiological Material Removal	0	17,000	0	**17,000**
International Material Protection	0	58,156	0	**58,156**
Domestic Material Protection	0	75,593	0	**75,593**
Total, Global Threat Reduction Initiative	**0**	**153,749**	**0**	**153,749**
Nonproliferation and International Security				
International Nuclear Security	12,421	0	0	**12,421**
Total, Nonproliferation and International Security	**12,421**	**0**	**0**	**12,421**
Total, Global Material Security	**130,527**	**153,749**	**142,475**	**426,751**

[a] This table shows the crosswalk from the FY 2015 budget structure to the proposed FY 2016 budget structure for Global Material Security. A crosswalk that captures all of Defense Nuclear Nonproliferation is included in the Overview section.

Global Material Security
Explanation of Major Changes (Comparable)
(Dollars in Thousands)

	FY 2016 vs FY 2015
International Nuclear Security: This decrease reflects a reduction in funding requested for MPC&A sustainability activities in Former Soviet Union (FSU) countries.	**-4,348**
Radiological Security: The increase for the Radiological Security subprogram reflects a continuation of efforts to accelerate the protection of IAEA Category 1 sources, domestically and internationally, in order to meet the 2014 Nuclear Security Summit commitment to secure these sources by 2016, as well as the expansion of efforts to encourage the transition from the use of isotopic to non-isotopic technologies, where feasible..	**+15,916**
Nuclear Smuggling Detection and Deterrence: The decrease reflects a return to requested/planned funding levels after the increase in FY 2015 to complete high-priority sites within the global nuclear detection architecture.	**-9,061**
Total, Global Material Security	**+2,507**

Global Material Security
International Nuclear Security

Description

These activities were previously performed under International Material Protection and Cooperation (IMPC) and Nonproliferation and International Security (NIS) in FY 2015. In FY 2016, these activities are now included under Global Material Security in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The INS subprogram works in cooperation with countries worldwide to enhance nuclear security by providing support for Nuclear Material Protection, Control, and Accounting (MPC&A) upgrades and improved nuclear security through best practices exchanges. INS also conducts technical exchanges to support continuing improvement and sustainability of MPC&A system effectiveness.

Given the size of Russia's material stockpiles, GMS will continue to look for partnership opportunities with Russia, on the general assumption that each side shall independently bear its costs related to cooperative activities. The goal of these activities would be to further enhance global nuclear security best practices and radiological security. INS supports selected MPC&A projects and technical exchanges outside of Russia, including in Belarus, China, India, Israel, Japan, Kazakhstan, and Korea.

INS assists partner countries in developing and maintaining a national-level nuclear security infrastructure that improves security practices and supports the sustainability of U.S.-funded security upgrades. Projects include support in developing and strengthening MPC&A regulations, implementing training and educational programs, developing sustainability planning, enhancing secure transportation, improving protective force capability, and developing and maintaining material control and accounting measurement capabilities. INS supports nuclear security culture enhancement activities internationally.

INS also directly supports the International Atomic Energy Agency's (IAEA) Division of Nuclear Security by providing technical and policy support for the development of IAEA nuclear security guidance documents and associated curricula, and providing subject matter experts for IAEA training workshops, International Physical Protection Advisory Service (IPPAS) missions, technical and other consultancies, and senior advisory committees. INS works bilaterally to train foreign partners on physical protection and nuclear security recommendations in IAEA INFCIRC 225/Revision 5 and knowledge security best practices.

FY 2017-FY 2020 Key Milestones

- (Oct 2016 – Sep 2020) Continue ongoing capacity building cooperation in at least 14 core countries and annually initiate capacity building engagement in up to 8 additional countries on the new physical protection security recommendations in INFCIRC 225/Rev 5.
- (Oct 2016 - Sep 2020) Complete two annual technical exchange workshops with Belarus to improve nuclear security best practices.
- (Oct 2016 - Sep 2020) Complete two annual joint training exercises with India as part of the Center of Excellence engagement.
- (Oct 2016 – Sep 2020) Complete one to two annual technical exchange workshops with Israel to improve nuclear security best practices.
- (Oct 2016 – Sep 2020) Conduct six to eight workshops per year in China.
- (Oct 2016 – Sep 2020) Develop and implement training courses and engage international partners on cyber security best practices for nuclear facilities, and improve on these best practices through development of new cyber security techniques, procedures and technologies.
- (Sep 2020) Complete development of fundamental MPC&A curriculum for a national training center in Kazakhstan by supporting national implementation of nuclear security best practices.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
International Nuclear Security $134,875,000	**International Nuclear Security $130,527,000**	**International Nuclear Security -$4,348,000**
• Continue engagement with India on the nuclear security components of its Center of Excellence, including one nuclear material security best practice exchange. • Provide sustainability support including support for training, procedures, maintenance, equipment repair, critical spare parts, performance testing, and other activities. • Provide support for IAEA development of nuclear security guidance document development, training, IPPAS missions, and other consultancies. • Work bilaterally with partner countries to provide training on IAEA INFCIRC 225/Revision 5 and knowledge security best practices. • Support enhanced nuclear security culture, promoting the importance of personal responsibility for MPC&A with bilateral partner countries and in cooperation with the IAEA. • Significantly increase support for MPC&A in key, non-FSU partner countries. • Continue to engage with China on modern nuclear material security methodologies and best practices, in support for the COE starting. • Conduct training, technical exchanges, and consultations to improve security at nuclear material locations and during transit. • Sustain and replace infrastructure equipment and update curriculum at training centers.	• Complete equipment purchases for the national nuclear training center in Kazakhstan; continue to fund curriculum development. • Conduct technical exchanges and workshop on MPC&A topics with Belarus, India, Israel, Japan, Korea and other international partners. • Support courses at partner country training facilities on nuclear security topics. • Continue support for nuclear security in key countries of concern. • Continue ongoing capacity building cooperation on the new physical protection security recommendations in INFCIRC 225/Rev 5. • Continue to provide policy and technical expertise to the IAEA for the furtherance of nuclear security initiatives, including development of Nuclear Security Series documents, support for IAEA International Physical Protection Advisory Service Missions, and strengthening of nuclear facility best practices, including cyber security best practices. **FY 2017-FY 2020** • Conduct technical exchanges and workshop on MPC&A topics with Belarus, India, Japan, Korea and other international partners. • Continue providing sustainability support to nuclear sites with MPC&A upgrades, including support for training, procedures, maintenance, equipment repair, critical spare parts, performance testing, and other activities. • Continue support for enhanced nuclear security	• This decrease reflects a reduction in funding requested for MPC&A sustainability activities in FSU countries.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
	culture, promoting the importance of personal responsibility for MPC&A with bilateral partner countries and in cooperation with the IAEA. • Continue U.S. expert technical engagement with China on modern nuclear material security methodologies and best practices, including in support for the COE, which will be operational in early FY 2016. • Continue support for nuclear security in key partner countries of concern. • Continue ongoing capacity building cooperation on the new physical protection security recommendations in INFCIRC 225/Rev 5. • Continue to provide policy and technical expertise to the IAEA for the furtherance of nuclear security initiatives, including development of Nuclear Security Series documents, support for IAEA International Physical Protection Advisory Service Missions, and strengthening of nuclear facility best practices, including cyber security best practices.	

Global Material Security – Radiological Security

Description

These activities were previously performed under the Global Threat Reduction Initiative in FY 2015. In FY 2016, these activities are now included under Global Material Security in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The Radiological Security subprogram supports the protection, replacement, recovery and disposal of radiological materials from sites worldwide. Each curie of this material that is protected or removed reduces the risk of a terrorist acquiring the material for misuse in a radiological dispersal device or "dirty bomb."

Protection efforts result in threat reduction by enhancing physical protection of in-use high activity radioactive sealed sources located at soft target sites (e.g., hospitals, universities, etc.) internationally and domestically, which is done in close cooperation with national, regional, and local agencies and the International Atomic Energy Agency. Protection efforts are a critical interim step towards permanent threat reduction solutions such as the application of technologies that do not rely on radioactive sources.

Removal activities support the recovery and disposal of excess or abandoned radiological materials. These include efforts to accelerate the consolidation and disposal of domestic radiological sources that have been deemed to be excess, in coordination with Federal, State, and local agencies and private industry, the completion of disposal efforts associated with RTGs, the repatriation of high-risk, legacy, U.S.-origin sealed sources in other countries, and the secure consolidation of other disused or orphaned radiological materials.

FY 2017-FY 2020 Key Milestones

- (Oct 2016 – Sep 2020) Complete security upgrades at an additional 622 buildings containing radiological material, resulting in a cumulative total of 2,649 domestic and international buildings secured.
- (Oct 2016 - 2020) Remove an additional 8,905 excess and unwanted sealed sources from locations in the United States, resulting in a cumulative total of more than 47,755 sources removed.

Radiological Security

Activities and Explanation of Changes

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Radiological Security $137,833,000	**Radiological Security $153,749,000**	**Radiological Security +$15,916,000**
• Prioritize outreach to remaining not-yet-volunteered domestic sites with IAEA Category 1 radioactive sources. Assess as many as possible with the goal of completing many of these enhancements in FY 2016. • Complete security upgrades at an additional 53 radiological buildings, resulting in a cumulative total of 723 domestic buildings secured. • Complete security upgrades at an additional 52 radiological buildings, resulting in a cumulative total of 1,167 international buildings secured. • Remove an additional 2,000 excess and unwanted sealed sources from locations in the United States, resulting in a cumulative total of more than 37,000 sources removed. • Recover and dispose of disused or orphaned radiological sources in other countries. • Work with Federal, State, and local authorities and the sites to support the sustainability of previously installed security upgrades domestically. • Expand domestic outreach to increase threat awareness and accelerate efforts to protect highest priority radiological sites; including in DHS Urban Area Security Initiative-designated cities. • Work with the IAEA, foreign regulators, and sites to support the sustainability of previously installed security upgrades internationally. • Implement, more broadly, best practices from the	• Complete security upgrades at an additional 95 buildings containing radiological material, (including a majority of the Category 1 buildings that volunteered in FY 2015), resulting in a cumulative total of 818 domestic buildings secured. • Complete security upgrades at an additional 42 buildings containing radiological material, resulting in a cumulative total of 1,209 international buildings secured. • Remove an additional 1,850 excess and unwanted sealed sources from locations in the United States, resulting in a cumulative total of more than 38,850 sources removed. • Recover and dispose or securely store disused or orphaned radiological sources in other countries. • Work with Federal, State, and local authorities and the sites to support the sustainability of previously installed security upgrades domestically. • Expand domestic outreach to increase threat awareness and accelerate efforts to protect highest priority buildings containing radioactive sources; including those in DHS Urban Area Security Initiative-designated cities. • Work with the IAEA, foreign regulators, and sites to sustain previously installed security upgrades internationally.	• The increase of $15.9 million for the Radiological Security subprogram reflects a continuation of efforts to accelerate the protection of IAEA Category 1 sources, domestically and internationally, prior to the 2016 Nuclear Security Summit as well as the expansion of efforts to encourage the transition from the use of isotopic to non-isotopic technologies, where feasible.

[a] These activities were previously performed under Global Threat Reduction Initiative in FY 2015. In FY 2016, these activities are now included under Global Material Security in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
two pilot Radiological Security Zones (Mexico City and Peru). • Expand efforts to find better long-term threat reduction solutions; including deploying source tracking tools and further develop and application of now nascent technologies that do not rely on radiological sources • Manufacture and further develop additional Type B transport packages to reduce costs and shorten schedule for recovery of highest-activity disused sources. • Continue efforts to work with States and the NRC to transfer long-term recovery and disposal costs from taxpayer to licensees.	• Expand replacement activities at buildings that currently use high activity radioactive sources that agree to switch to non-isotopic based technologies. • Expand efforts to find better long-term threat reduction solutions; including deploying source tracking tools and further development and application of now nascent technologies that do not rely on radioactive sources. **FY 2017-FY 2020** • Complete security upgrades at an additional 400 domestic buildings containing radiological material, resulting in a cumulative total of 1,218 domestic buildings secured. • Complete security upgrades at an additional 222 international buildings containing radiological material, resulting in a cumulative total of 1,431 international buildings secured. • Remove an additional 8,905 excess and unwanted sealed sources from locations in the United States, resulting in a cumulative total of more than 47,755 sources removed. • Perform limited recovery and disposal (or securely store) of disused or orphaned radioactive sources in other countries. • Work with Federal, State, and local authorities and the sites to support the sustainability of previously installed security upgrades domestically. • Continue outreach to increase threat awareness and accelerate efforts to protect highest priority buildings containing radioactive sources. • Work with the IAEA, foreign regulators, and sites to sustain previously installed security upgrades internationally.	

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
	• Expand replacement activities at buildings that currently use high activity radioactive sources that agree to switch to non-isotopic based technologies. • Expand efforts to more efficiently and effectively address out-year scope and find better long-term threat reduction solutions, including deployment of source tracking tools and further development and application of new technologies that do not rely on radioactive sources.	

Global Material Security
Nuclear Smuggling Detection and Deterrence

Description

These activities were previously performed under International Materials Protection and Cooperation in FY 2015. In FY 2016, these activities are now included under Global Material Security in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The Nuclear Smuggling Detection and Deterrence subprogram, formerly the Second Line of Defense (SLD) program, strengthens the capacity and commitment of foreign governments to deter, detect, and interdict illicit trafficking in nuclear and other radioactive materials across and within international borders and through the global maritime shipping system. NSDD's strategy is to improve partner countries' capacity by providing fixed and mobile radiation detection systems and associated training, maintenance and sustainability support. NSDD deploys its systems at carefully selected locations as part of the broader USG layered, defense-in-depth approach to countering nuclear trafficking. NSDD also coordinates with the International Atomic Energy Agency (IAEA), the European Union, Interpol, and other organizations to facilitate coordination and consistency in efforts to counter nuclear smuggling.

NSDD's priorities include addressing remaining gaps in fixed detection capabilities in the Global Nuclear Detection Architecture (GNDA), expansion of mobile detection, and continued emphasis on sustainability. NSDD optimizes the placement of radiation detection monitors based on an analysis of threat, terrain, and other factors. NSDD also continually assesses detector performance and effectiveness based on extensive performance data.

	FY 2014 Actual	FY 2015	FY 2016	Cumulative through FY 2016
Fixed Site Installations	37	13	24	587
Mobile Installations	22	20[a]	20	108
Indigenous sustainment	62	59	68	558

Installations of fixed sites will increase in FY 2016 due to an increase in work scope in the Middle East and Africa to address remaining gaps in the GNDA. In FY 2016, NSDD will transition an additional 68 sites to indigenous sustainability, bringing the total to over 550. NSDD will also continue efforts to attract host-country and industry funding of radiation detection systems through donations, cost-sharing arrangements, and technical exchanges.

The International Nuclear Forensics Cooperation Program will be transferred from the Nonproliferation and International Security Program to NSDD in FY 2016. NSDD will continue efforts to strengthen foreign partner nuclear forensics analytical capability and best practices, which are integral to a robust program to deter illicit trafficking. The program will engage up to 13 partners bilaterally to strengthen nuclear forensics capabilities. NSDD will also work multilaterally with the IAEA and the Global Initiative to Combat Nuclear Terrorism (GICNT) on the development of international guidance documents and best practices.

FY 2017-FY 2020 Key Milestones

- (Sep 2017) Equip a cumulative total of 606 sites/ports with radiation detection equipment
- (Sep 2017) Deploy a cumulative total of 129 MDS.
- (Sep 2017) Transition a cumulative total of 620 sites/ports/MDS to indigenous partner country responsibility
- (Sep 2018) Equip a cumulative total of 622 sites/ports with radiation detection equipment.
- (Sep 2018) Deploy a cumulative total of 148 MDS.
- (Sep 2018) Transition a cumulative total of 684 sites/ports/MDS to indigenous partner country responsibility.
- (Sep 2019) Deploy fixed and mobile systems to high-priority airports in the Middle East and Asia, contingent upon outcome of future analysis.
- (Sep 2019) Transition a cumulative total of 741 sites/ports/MDS to indigenous partner country responsibility.
- (Sep 2020) Deploy fixed and mobile systems to high-priority airports in the Middle East and Asia, contingent upon

[a] Mobile Detection Systems (MDS) deployments decreased as a result of reduced funding in FY 2015.

outcome of future analysis.

- (Sep 2020) Transition a cumulative total of 786 sites/ports/MDS to indigenous partner country responsibility.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Nuclear Smuggling Detection and Deterrence $151,536,000	**Nuclear Smuggling Detection and Deterrence $142,475,000**	**Nuclear Smuggling Detection and Deterrence -$9,061,000**
• Provide 20 additional mobile and man-portable systems for use by law enforcement at internal checkpoints in countries of strategic interest. • Continue providing training in equipment maintenance and alarm response to law enforcement personnel in approximately 15 countries. • Complete fixed radiation detection systems at approximately 25 sites/ports in eight countries, focusing on key gaps in the global nuclear detection architecture. • Connect sites to national communications systems in 3 countries. • Continue to transition full responsibility for the long term operation (sustainability) of over 200 sites/ports/MDS where the systems have been installed but are not yet indigenously sustained. Note: NSDD will be actively transitioning to partner countries full responsibility for maintenance of and training on installed NSDD systems from FY 2015 through FY 2021, with planned completion in FY 2022. • Continue outreach to governments and industry to encourage provision of radiation detection equipment at large-container seaports. • Continue to develop potential for other governments to rapidly mobilize assets during times of enhanced steady state operations. • Continue technical collaboration with industry and countries seeking to install their own radiation detection systems.	• Provide 20 additional mobile and man-portable systems for use by law enforcement at internal checkpoints in countries of strategic interest. • Continue providing training in equipment maintenance and alarm response to law enforcement in approximately 15 countries. • Complete fixed radiation detection systems at approximately 24 sites in eight countries, focusing on key gaps in the global nuclear detection architecture and major hubs in the global maritime shipping network. • Connect sites to national communications systems in three countries • Continue to transition full responsibility for the long term operation (sustainability) of over 175 sites/ports where the systems have been installed but are not yet indigenously sustained. • Continue outreach and technical collaboration with governments and industry to encourage and support provision of radiation detection equipment at large-container seaports. • Continue to support development of protocols for partner countries to rapidly coordinate across agencies and mobilize assets during times of enhanced steady state operations. • Support assurance visits to verify continued operation of equipment installed in 55+ countries. • Fund international exercises and workshops, on optimal operation of equipment and improved regional response to trafficking incidents. • Provide technical expertise and support to	• The decrease reflects a return to requested/planned funding levels after the increase in FY 2015 to complete high-priority sites within the global nuclear detection architecture.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
• Support assurance visits to verify continued operation of equipment installed by NSDD in 55+ countries, including the equipment installed by the U.S. Department of Defense in Uzbekistan. • Fund exercises and workshops, on country and regional levels, to help ensure optimal operation of equipment and improve regional response to trafficking incidents. • Provide technical expertise and support to ongoing indigenous improvements of installed radiation detection programs in partner countries, technical collaborations, sharing of lessons learned, best practices workshops, and exercises. This includes continuing technical analysis of extensive data and information provided to NSDD. • Provide limited technical support to over 460 sites/ports already transitioned to partner country responsibility.	ongoing indigenous improvements of installed radiation detection programs in partner countries including analysis of data provided to NSDD. • Provide limited technical support to over 490 sites/ports already transitioned to partner country responsibility • Engage bilaterally with up to 13 foreign partners to strengthen nuclear forensics capabilities. • Work with IAEA and the GICNT on the development of guidance documents best practices, and other key forensics issues. **FY 2017-FY 2020** • Complete deployment of 148 Mobile Detection systems (cumulative) • Complete installation of fixed radiation detection systems to close gaps in the Global Nuclear Detection System Architecture as identified by the Strategic Review, a cumulative of approximately 632 sites and ports • Continue to transition 786 sites (cumulative) to indigenous partner country responsibility. • Continue to develop/provide technical expertise to partner countries • Provide limited technical support to already transitioned partners • Engage up to 13 partners annually to strengthen foreign partner nuclear forensics capabilities. • Continue work with the IAEA and the GICNT on the development of guidance documents, best practices, and other key forensics issues.	

Global Material Security Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
MPC&A Upgrades - Buildings - Cumulative number of buildings containing weapons-usable material with completed MPC&A upgrades.							
Target	229 buildings	229 buildings	N/A	N/A	N/A	N/A	N/A
Result	218						
Endpoint Target	By Q3 of FY 2015, complete MPC&A upgrades on a cumulative total of 229 buildings containing weapon-usable nuclear material.						
	Note: IMPC will not achieve the annual target of completing MPC&A upgrades at 229 buildings. Three additional buildings were completed by Q1 of FY 2015 to complete 221 buildings, but work on 8 remaining buildings will not be completed with U.S. funding, due to Russia's discontinuation of this joint work. MPC&A will submit a change request to adjust the FY 2015 target.						
	Note: This performance measure was located under the International Material Protection & Cooperation program in the FY 2015 Congressional Budget Request.						
MPC&A Initiatives - Annual number of total upgrade and sustainability initiatives completed and transitioned to host country.							
Target	12 initiatives completed	18 initiatives completed	4 initiatives completed	2 initiatives completed	12 initiatives completed	N/A	N/A
Result	12						
Endpoint Target	By the end of FY 2018, complete the sustainability phase of 48 MPC&A initiatives with foreign partners. However, due to Russia's discontinuation of joint work, FY 2015 targets will likely not be met. MPC&A will submit a change request to adjust the FY 2015 target by Q3.						
	Note: This performance measure was located under the International Material Protection and Cooperation program in the FY 2015 Congressional Budget Request.						
Second Line of Defense (SLD) Sites - Cumulative number of Second Line of Defense (SLD) sites with nuclear detection equipment installed.							
Target	548 sites	563 sites	587 sites	606 sites	622 sites	627 sites	632 sites
Result	550						
Endpoint Target	By the end of FY 2020, provide radiation detection equipment to approximately 632 cumulative SLD sites. The SLD program name was changed to Nuclear Smuggling Detection and Deterrence (NSDD) as of January 1, 2015.						
	Note: The increase in target in the FY 2019 and FY 2020 represents NSDD program projections for newly identified gaps in the Global Nuclear Detection Architecture including 10 high-priority airports in the Middle East and Asia that were not included in the 2012 Strategic						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020

Review.

Note: This performance measure was located under the International Material Protection and Cooperation program in the FY 2015 Congressional Budget Request.

Second Line of Defense (SLD) Sustainability - Cumulative number of Second Line of Defense (SLD) fixed sites and Mobile Detection System (MDS) deployments that are being indigenously sustained.

Target	431 sites/ports	490 sites/ports (460 fixed; 30 MDS)	558 sites/ports (512 fixed; 46 MDS)	620 sites/ports (547 fixed; 73 MDS)	684 sites/ports (596 fixed; 88 MDS)	741 sites/ports (636 fixed; 105 MDS)	786 sites/ports (662 fixed; 124 MDS)
Result	412						

Endpoint Target: By the end of FY 2023, transition over 800 SLD sites and MDS deployments to indigenous sustainment. The SLD program name was changed to Nuclear Smuggling Detection and Deterrence (NSDD) as of January 1, 2015.

Note: NSDD missed its target by 19 in FY 2014. These sites are located in very high risk/high threat areas (i.e., Ukraine, Lebanon, Jordan, and Kazakhstan). These countries asked for short-term extensions of SLD sustainability support to assist them in covering either budget shortfalls or to compensate for other governmental challenges (e.g., Lebanon, Jordan, Ukraine, etc.) that are temporarily delaying these countries from taking full responsibility for these sites. SLD expects these countries to take full responsibility for these sites in the next few years.

In July 2014, the NSDD Program submitted a request to OMB to combine fixed and MDS deployments in one sustainability metric, which will streamline the reporting process for radiation detection systems, both fixed and mobile, that are being indigenously sustained by partner countries. These numbers reflect that change.

Note: This performance measure was located under the International Material Protection and Cooperation program in the FY 2015 Congressional Budget Request.

Second Line of Defense (SLD) Mobile Detection System (MDS): Cumulative number of Mobile Detection Systems deployed.

Target	68 MDS (23 countries)	88 MDS	108 MDS	129 MDS	148 MDS	N/A	N/A
Result	76 MDS (18 countries)						

Endpoint Target: By the end of FY 2018, deploy 148 Mobile Detection Systems. The SLD program name was changed to Nuclear Smuggling Detection and Deterrence (NSDD) as of January 1, 2015.

FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020

Note: Beginning in FY 2015 the number of MDS countries will not be reported separately. In July 2014, the NSDD Program submitted a request to OMB to remove the number of countries from the MDS deployment metric. This measure was identified as not representative of mobile detection capability and the target was changed in accordance with OMB Circular A-11 and DOE policy. NSDD exceeded its MDS deployments yet fell short of its host country targets due to delays in shipments and concluding a Memorandum of Understanding in six countries.

Note: Due to changes in FY 2014 actuals, FY 2015 and out year targets may need to be adjusted. GMS plans to submit a change request to update the target.

Note: This performance measure was located under the International Material Protection and Cooperation program in the FY 2015 Congressional Budget Request.

Radiological Buildings Protected - Cumulative number of buildings with high-priority radiological materials secured.

Target	1,785 buildings	1,890 buildings	2,027 buildings	2,167 buildings	2,321 buildings	2,479 buildings	2,649 buildings
Result	1,816						

Endpoint Target: The previous end date to complete upgrades at all 8,500 sites by 2044 is now TBD pending a programmatic review that takes into account the availability of more specific historical cost data and the development of new tracking and non-isotopic technologies. The anticipated completion date of security upgrades at domestic sites has been revised to 2027. More data is needed to assess the impact on the international upgrades schedule. The date of 2027 does not apply to the recovery of disused sources domestically or the replacement of sources with non-isotopic technologies.

Note: Due to FY 2015 funding restrictions, out year metrics will be revised. GMS plans to submit a change request for the FY 2016 through FY 2020 targets.

Note: This performance measure was located under the Global Threat Reduction Initiative program in the FY 2015 Congressional Budget Request.

Global Management Security
Construction Projects Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	25,258	25,258	0	0	0	0	0
Plant Projects (GPP) (<$10M)	3,255	3,255	0	0	0	0	0
Total, Capital Operating Expenses	**28,513**	**28,513**	**0**	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	25,258	25,258	0	0	0	0	0
Total, Capital Equipment (including MIE)	**25,258**	**25,258**	**0**	**0**	**0**	**0**	**0**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**3,255**	**3,255**	**0**	**0**	**0**	**0**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**3,255**	**3,255**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**28,513**	**28,513**	**0**	**0**	**0**	**0**	**0**

Outyears to Completion for Global Management Security

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	0	0	0	0
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**0**	**0**	**0**	**0**

International Material Protection and Cooperation [a]
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
International Material Protection and Cooperation					
Nuclear Warhead Protection	23,173	5,141	0	0	0
Weapons Material Protection	36,357	15,197	4,448	0	-4,448
Material Consolidation and Civilian Sites	132,299	86,868	114,857	0	-114,857
National Infrastructure and Sustainability Program	37,796	44,151	3,606	0	-3,606
Second Line of Defense	190,000	262,021	148,000	0	-148,000
International Contributions [b]	0	1,713	0	0	0
Total, International Material Protection and Cooperation	**419,625**	**415,091**	**270,911**	**0**	**-270,911**

Outyears International Material Protection and Cooperation
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
International Material Protection and Cooperation				
Nuclear Warhead Protection	0	0	0	0
Weapons Material Protection	0	0	0	0
Material Consolidation and Civilian Sites	0	0	0	0
National Infrastructure and Sustainability Program	0	0	0	0
Second Line of Defense	0	0	0	0
International Contributions [b]	0	0	0	0
Total, International Material Protection and Cooperation	**0**	**0**	**0**	**0**

[a] International Material Protection and Cooperation program is being restructured into the Global Material Security Program starting in FY 2016.

[b] The FY 2014 total includes international contributions of $997,800 from the United Kingdom, $458,975 from Finland and $255,810 from New Zealand.

Global Threat Reduction Initiative [a]
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current [b]	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Global Threat Reduction Initiative					
Highly Enriched Uranium (HEU) Reactor Conversion	**162,000**	**161,648**	**119,383**	**0**	**-119,383**
International Nuclear and Radiological Material Removal and Protection					
Nuclear Material Removal	0	0	58,441	0	-58,441
Russian-Origin Nuclear Material Removal	78,000	77,858	0	0	0
U.S.-Origin Nuclear Material Removal	5,000	5,000	0	0	0
Gap Nuclear Material Removal	32,102	32,102	0	0	0
Emerging Threat Nuclear Material Removal	13,000	13,000	10,095	0	-10,095
International Radiological Material Removal	13,000	13,000	12,601	0	-12,601
International Material Protection	59,000	59,000	36,600	0	-36,600
Total, International Nuclear and Radiological Material Removal And Protection	**200,102**	**199,960**	**117,737**	**0**	**-117,737**
Domestic Radiological Material Removal and Protection					
Domestic Radiological Material Removal	20,600	20,600	67,987	0	-67,987
Domestic Material Protection	59,400	59,229	20,645	0	-20,645
Total, Domestic Radiological Material Removal and Protection	**80,000**	**79,829**	**88,632**	**0**	**-88,632**
International Contributions [c]	**0**	**3,161**	**0**	**0**	**0**
Total, Global Threat Reduction Initiative	**442,102**	**444,598**	**325,752**	**0**	**-325,752**

[a] Global Threat Reduction Initiative program is being restructured into the Global Material Security program and the Material Management and Minimization program starting in FY 2016.

[b] Reflects: a reprogramming of -$351,643.00 from HEU Reactor Conversion to support Domestic Uranium Enrichment activities through FY 2014 a reprogramming of -$141,730.00 from Nuclear Material Removal to support Domestic Uranium Enrichment activities through FY 2014 and a reprogramming of $ 171,000 from Domestic Material Protection to support Domestic Uranium Enrichment activities through FY 2014.

[c.] FY 2014 includes $3,161,000 of International contributions; $499,970 from the Netherlands, $2,461,110 from the United Kingdom, and $200,000 from South Korea.

Material Management and Minimization [a]

Overview

DNN's request supports national security priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, both of which are reflected in the Department of Energy Strategic Plan. These priorities include the efforts to secure or eliminate the world's most vulnerable nuclear weapon materials; disposing of excess nuclear weapon and radiological materials in the United States; supporting the development of new technologies for nonproliferation; promoting the secure expansion of nuclear energy; and improving capabilities worldwide to deter and detect the illicit movement of nuclear materials.

The FY 2016 Material Management and Minimization (M^3) Budget Request presents an integrated approach to addressing the persistent threat posed by the global stockpile of nuclear materials. The primary objectives of the program are to minimize and, when possible, eliminate nuclear materials and ensure sound management principles for materials that remain.

M^3 directly contributes to meeting the DOE strategic goal for "Nuclear Security" and plays a critical role in meeting Strategic Objective 6 to reduce global nuclear security threats through highly enriched uranium (HEU) and plutonium disposition, HEU minimization by converting research reactors and medical isotope production facilities to the use of low enriched uranium (LEU), and removal of excess HEU and separated plutonium. The program also plays an important role in the discussions for developing multilateral HEU and plutonium management and minimization strategies with international partners.

Highlights of the FY 2016 Budget Request

- The Conversion subprogram will continue the pursuit of reactor conversions/shutdowns during the FY 2016 - FY 2020 time frame, while limiting scope with Russia to technical engagement on additional reactor conversions/shutdowns beyond the current pilot program. Six facilities will be converted or verified as shutdown in FY 2016.
- During this time frame, the Conversion subprogram will continue to support its molybdenum-99 (Mo-99) commercial partners to expand domestic Mo-99 production without HEU and assist global Mo-99 production facilities to eliminate the use of HEU targets by the end of 2016.
- The Conversion subprogram also plans to establish the Uranium Lease and Take-Back (ULTB) program by January 2016, in accordance with the American Medical Isotopes Production Act of 2012.
- The Nuclear Material Removal subprogram will continue to identify and eliminate excess HEU and plutonium, including removing and/or disposing of 225 kilograms of material from Kazakhstan, Argentina, Canada, Germany, Switzerland, Poland, and possibly Ghana.
- The Material Disposition subprogram will continue to support the Administration's commitment to plutonium disposition to: 1) dispose of excess U.S. plutonium; and 2) achieve Russian disposition of equal quantities of plutonium. The Administration recognizes the importance of the U.S.-Russia Plutonium Management and Disposition Agreement (PMDA), whereby each side committed to dispose of at least 34 metric tons of weapon-grade plutonium. In support of this goal, over 350 kg of plutonium will be converted to oxide in FY 2016 for eventual disposition.

Major Outyear Priorities and Assumptions

Outyear funding levels for the M^3 program totals $1,346,040 for FY 2017 through FY 2020. The program plays a key role in supporting the Secretary's goal of enhancing and implementing nuclear security commitments made by the United States and our international partners at forums such as the Nuclear Security Summits held in Washington, D.C. in FY 2010, Seoul, South Korea in FY 2012, The Hague, Netherlands in FY 2014, and the United States (location still to be determined) in FY 2016. $M^3$is currently working in over 25 countries around the world to implement nuclear material minimization strategies in line with this goal. By the end of 2020, the M^3 program will have converted or verified the shutdown of 118 of

[a] This is a new structure change for FY 2016. Material Management and Minimization consolidates certain subprograms included in the following former programs: Global Threat Reduction Initiative and Fissile Materials Disposition program.

the approximately 200 HEU research reactors and isotope production facilities around the world and removed approximately 6,800 kilograms of excess weapons-useable nuclear materials. In addition, M^3 will continue to work with the Russians and the IAEA to ensure that surplus U.S. and Russian plutonium is disposed of in accordance with the amended U.S.-Russia PMDA.

Material Management and Minimization
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Material Management and Minimization					
Conversion	**0**	**0**	**0**	**115,000**	**+115,000**
Nuclear Material Removal	**0**	**0**	**0**	**114,000**	**+114,000**
Material Disposition	**0**	**0**	**0**	**82,584**	**+82,584**
Total, Material Management and Minimization	**0**	**0**	**0**	**311,584**	**+311,584**

Material Management and Minimization
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Material Management and Minimization					
Conversion	**162,000**	**161,648**	**119,383**	**115,000**	**-4,383**
Nuclear Material Removal	**128,102**	**127,960**	**68,536**	**114,000**	**+45,464**
Material Disposition	**132,057**	**131,957**	**85,000**	**82,584**	**-2,416**
Total, Material Management and Minimization	**422,159**	**421,565**	**272,919**	**311,584**	**+38,665**

Outyears for Material Management and Minimization
Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Material Management and Minimization				
Conversion	**107,000**	**118,418**	**126,000**	**115,000**
Nuclear Material Removal	**112,311**	**115,374**	**111,042**	**111,042**
Material Disposition	**96,152**	**103,801**	**111,452**	**118,448**
Total, Material Management and Minimization	**315,463**	**337,593**	**348,494**	**344,490**

Material Management and Minimization
Proposed Budget Structure Changes

The FY 2015 Consolidated and Further Continuing Appropriations Act funded Defense Nuclear Nonproliferation (DNN) Activities under five programs. In FY 2016, NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation Research and Development (R&D).

In 2016, elements of the former Global Threat Reduction Initiative are to be integrated into Material Management and Minimization. These include: HEU Reactor Conversion and Nuclear Material Removal. In addition, U.S. Plutonium Disposition, U.S. Uranium Disposition and Russian Surplus Fissile Materials Disposition under the former Fissile Materials Disposition program are also integrated into Material Management and Minimization.

Budget Structure Crosswalk
(Dollars in Thousands)[a]

	FY 2016 Budget Structure			
	Material Management and Minimization			
	Conversion	Nuclear Material Removal	Material Disposition	Total
FY 2015 Budget Structure				
Defense Nuclear Nonproliferation				
Surplus Fissile Materials Disposition				
U.S. Plutonium Disposition	0	0	50,504	50,504
U.S. Uranium Disposition	0	0	31,080	31,080
Russian Surplus Fissile Material Disposition[b]	0	0	1,000	1,000
Total, Surplus Fissile Materials Disposition	**0**	**0**	**82,584**	**82,584**
Global Threat Reduction Initiative				
HEU Reactor Conversion	115,000	0	0	115,000
International Nuclear and Radiological Material Removal and Protection [c]	0	114,000	0	114,000
Total, Global Threat Reduction Initiative	**115,000**	**114,000**	**0**	**229,000**
Total, Material Management and Minimization	**115,000**	**114,000**	**82,584**	**311,584**

[a] This table shows the crosswalk from the FY 2015 budget structure to the proposed FY 2016 budget structure for the Material Management and Minimization program only. A crosswalk that captures all of Defense Nuclear Nonproliferation is included in the Overview section.
[b] In FY 2016, NNSA is proposing to rename this activity to "International Plutonium Disposition" in order to implement plutonium startegies with international partners.
[c] Excludes International Radiological Material Removal and International Material Protection.

Material Management and Minimization
Explanation of Major Changes (Comparable)
(Dollars in Thousands)

	FY 2016 vs FY 2015
Conversion: The reduction in funding reflects the planned reduction of support in two areas. The first area is Russian reactor conversion, as the convert subprogram will limit engagement to only technical exchanges on conversions/shutdowns beyond the pilot program. The second area is support for domestic and international Mo-99 production partners, because funding was committed in prior fiscal years, and FY 2016 levels are consistent with the expected ramp-up of commercial, non-HEU-based Mo-99 production in the United States.	**-4,383**
Nuclear Material Removal: The increase in funding reflects activities associated with the removal of HEU from miniature neutron source reactors in Africa, as well as preparatory activities for future shipments from Europe and Japan, which will be performed with appropriate cost-sharing.	**+45,464**
Material Disposition: The decrease is primarily attributed to the use of prior-year uncosted balances. The requested new budget authority is based on the assumption of depleting the prior-year balances in FY 2016 to continue the work scope.	**-2,416**
Total, Material Management and Minimization	**+38,665**

Material Management and Minimization
Conversion

Description

These activities were previously performed under Global Threat Reduction Initiative in FY 2015. In FY 2016, these activities are now included under Material Management and Minimization in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The Conversion subprogram, referred to as the Convert subprogram, supports the conversion of domestic and international civilian research reactors and isotope production facilities to non-weapons usable nuclear materials. These efforts result in permanent threat reduction by minimizing and, to the extent possible, eliminating the use of HEU in civilian applications. This includes working with global molybdenum-99 (Mo-99) producers to convert their existing operations to use LEU targets and accelerating the development of new non-HEU-based Mo-99 production capabilities in the United States.

The Convert subprogram will continue pursuing reactor conversions and verifying shutdowns around the world. Convert work in Russia will continue, but the near term focus will be restricted to the pilot reactors agreed to in the original scope of the 2010 Agreement between DOE and Rosatom. The U.S. role in additional reactor conversion cooperation in Russia is anticipated to be limited to only technical exchanges. Outyear metrics have been reduced to reflect the policy decision to restrict U.S. cost-sharing for scope beyond the original pilot reactors.

The Convert subprogram will also establish a Uranium Lease and Take-Back (ULTB) program by January 2016 as required by the American Medical Isotopes Production Act of 2012. Under this activity, DOE will make LEU available to commercial entities through lease contracts for the production of Mo-99.

FY 2017 – FY 2020 Key Milestones

- (Sep 2017) Establish additional non-HEU based Mo-99 production capabilities in the United States.
- (Sep 2020) Complete conversion or verify shutdown of an additional 16 research reactors and two isotope production facilities for a total of 118.
- (Sept 2020) Continue ongoing work with any commercial entity eligible to utilize the ULTB activity.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Conversion $119,383,000	**Conversion $115,000, 000**	**Conversion -$4,383,000**
• Convert an additional two reactors in FY 2015 for a total of 94 including the first Chinese-origin Miniature Neutron Source Reactor (MNSR) from HEU to LEU fuel, allowing for future conversions in six, high-priority foreign countries. • Establish the first domestic source of non-HEU produced Mo-99. • Provide technical and financial support to the U.S. private sector to accelerate the establishment of a reliable domestic production capability for the critical medical isotope Mo-99 without the use of HEU and to existing global Mo-99 producers to convert from the use of HEU targets to LEU targets.	• Convert an additional six reactors and isotope production facilities in FY 2016 for a total of 100 including Ghana's MNSR. • Provide technical and financial support to the U.S. private sector to accelerate the establishment of a reliable domestic production capability for Mo-99 without the use of HEU and to existing global Mo-99 producers to convert from the use of HEU to LEU targets. • Establish a Uranium Lease and Take-Back (ULTB) program. **FY 2017-FY 2020** • Complete conversion or verify shutdown of an additional 18 research reactors and isotope production facilities for a total of 118 by the end of FY 2020. • Establish additional non-HEU based Mo-99 production capabilities in the United States. • Continue ongoing work with any commercial entity eligible to utilize the ULTB.	• The reduction in the FY 2016 request reflects 1) the limitation of the Convert subprogram in Russia to only technical exchanges on conversions/shutdowns beyond the pilot program and 2) the planned reduction of support to the domestic and international Mo-99 partners because funding was committed in prior fiscal years, and FY 2016 levels are consistent with the expected ramp-up of commercial, non-HEU-based Mo-99 production in the United States.

[a] These activities were previously performed under Highly Enriched Uranium (HEU) Reactor Conversion within Global Threat Reduction Initiative in FY 2015. The FY 2015 activities and funding are shown here in comparable format.

Material Management and Minimization
Nuclear Material Removal

Description

These activities were previously performed under Global Threat Reduction Initiative in FY 2015. In FY 2016, these activities are now included under Material Management and Minimization in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format**.** The Nuclear Material Removal subprogram, referred to as the Remove subprogram, supports the removal, consolidation, and disposal of excess nuclear material from civilian sites worldwide. Each kilogram or curie of this dangerous material that is removed reduces the risk of a terrorist acquiring the material for use in a nuclear weapon.

This activity supports the removal, consolidation, and disposal of U.S.-origin HEU and LEU (from TRIGA and MTR-type reactors), Russian-origin HEU, and other high-risk nuclear materials ("Gap" Material). The subprogram will continue to support the removal of U.S.-origin HEU and LEU spent fuel to the United States until FY 2019, as part of an incentive for countries to convert research reactors from HEU to LEU. The Remove subprogram also will continue to remove Russian-origin HEU from third countries and support the removal and disposal of vulnerable, high-risk nuclear materials that are not covered by the Russian-origin and U.S.-origin Nuclear Material Removal activities. This includes U.S.-origin HEU other than TRIGA and MTR fuel, HEU of non-U.S. and non-Russian-origin, and separated plutonium.

In addition, as part of its mission to address emerging threats, the Remove subprogram will continue to develop the capability to rapidly respond, if asked, to support the removal of nuclear material from countries of concern (e.g., Libya 2004). This includes in-country stabilization, packaging, and removal of nuclear materials (focusing on HEU and plutonium) through the deployment of self-sufficient, trained rapid response teams and mobile facilities.

FY 2017-FY 2020 Key Milestones

- (Sep 2020) Remove or confirm disposition of 1,243 additional kilograms of vulnerable nuclear material for a cumulative total of approximately 6,800 kg. This includes material from Canada, Japan, France, and Kazakhstan.
- (Sep 2020) Consolidate to fewer locations material that can't be removed or disposed.
- (Sep 2018) Conduct mock deployments to address emerging threats.
- (Sep 2020) Continue to ensure a short-term readiness posture to deploy assets rapidly to assist in recovery of nuclear materials by conducting preventative equipment maintenance, conducting limited scope performance tests, and replacing equipment to maintain state-of-the-art technical capability.

Nuclear Material Removal

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Nuclear Material Removal $68,536,000	**Nuclear Material Removal $114,000,000**	**Nuclear Material Removal +$45,464,000**
• Remove and/or confirm the disposition of an additional 125 kilograms of HEU and plutonium from countries such as Argentina, Jamaica, Kazakhstan, Uzbekistan, Belgium, Italy, Belarus, and Canada, for a cumulative total of 5,332 kilograms. • Ensure a short-term readiness posture to deploy assets rapidly to assist in recovery of nuclear materials by conducting preventative equipment maintenance, conducting limited scope performance tests, and replacing equipment to maintain state-of-the-art technical capability.	• Remove and/or confirm the disposition of an additional 225 kilograms of HEU and plutonium from countries such as Argentina, Kazakhstan, Italy, Belarus, Poland, Switzerland, Germany, Canada, and possibly Ghana for a cumulative total of 5,557 kilograms. • Consolidate to fewer locations material that cannot be removed or disposed. • Continue to ensure a short-term readiness posture to deploy assets rapidly to assist in recovery of nuclear materials by conducting preventative equipment maintenance, conducting limited scope performance tests, and replacing equipment to maintain state-of-the-art technical capability. **FY 2017-FY 2020** • By the end of FY 2020, remove and/or confirm disposition of 1,243 additional kilograms of vulnerable nuclear material for a cumulative total of approximately 6,800 kg. This includes material from Canada, Japan, France, and Kazakhstan. • Consolidate to fewer locations material that cannot be removed or disposed by 2020. Conduct Emerging Threats mock deployment in FY 2018. • Continue to ensure a short-term readiness posture to address Emerging Threats.	• The increase in the FY 2016 request is due to activities associated with the removal of HEU from MNSRs in Africa, as well as preparatory activities for future shipments from Europe and Japan, which will be performed with appropriate cost-sharing.

[a] These activities were previously performed under International Nuclear and Radiological Material Removal and Protection within Global Threat Reduction Initiative in FY 2015. The FY 2015 activities and funding are shown here in comparable format.

Material Management and Minimization
Material Disposition

Description

These activities were previously performed under Fissile Materials Disposition in FY 2015. In FY 2016, these activities are now included under Material Management and Minimization in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The Material Disposition subprogram is responsible for disposing of surplus weapon-grade plutonium and highly enriched uranium in the U.S., working with Russia to dispose of Russian surplus weapon-grade plutonium under the U.S. - Russia Plutonium Management and Disposition Agreement (PMDA), directing the international plutonium management initiative, and managing material for peaceful uses.

During FY 2013, activities associated with the current plutonium disposition strategy were slowed while the Department conducted an analysis of options to complete the mission more efficiently. The Secretary established a Plutonium Disposition Working Group to undertake this options analysis. On April 29, 2014, the Department released the working group's preliminary study of potential disposition options which will serve as a basis for evaluating the best path forward for plutonium disposition. The options analyzed included the MOX fuel approach, irradiation of plutonium fuel in fast reactors, and non-reactor options. The non-reactor options included immobilization with high-level waste, down-blending and disposal, and deep borehole disposal. Based upon the analysis, the Department determined that the MOX fuel approach is significantly more expensive with a life cycle cost estimate of approximately $30 billion, even with consideration of potential contract restructuring and other improvements that have been made to the MOX project.

The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a FFRDC, to perform these analyses. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition.

The Material Disposition programmatic activities that are not part of the MFFF or Waste Solidification Building (WSB) line item construction projects but are necessary to support the overall M^3 program to dispose of surplus weapon-grade plutonium as MOX fuel include surplus nuclear weapon pit disassembly and conversion of resultant metal to oxide as feed for MFFF which is being conducted in ARIES at LANL; conversion of other non-pit plutonium to oxide at H-Canyon/HB-Line at Savannah River also as feed for MFFF; and storage of surplus pits at Pantex.

Over the past decade, the NNSA has eliminated more than 146 metric tons (MT) of weapons-usable HEU by down-blending it to Low Enriched Uranium (LEU) or shipped for down-blending for use in power and research reactors in the U.S. and abroad. The program has substantially reduced holdings of fissile materials throughout the Department of Energy complex, rid the world of 5,800 weapons worth of unneeded bomb material, helped reduce civil use of HEU worldwide, and made a significant contribution to electricity supplies. The program has also been able to off-set appropriations for the program by using bartering to pay for commercial down-blending services, and funds received from the sale of LEU are returned to the U.S. Treasury. The future focus is to continue progress in down-blending HEU to meet nonproliferation objectives, and the development of future projects from unallocated HEU inventories.

In addition, the program will support Russian efforts to dispose of at least 34 MT of Russian surplus weapon-grade plutonium withdrawn from its nuclear weapons program as required under the amended U.S.-Russia PMDA and will be the focal point within DNN for the development of international plutonium management strategies with countries other than Russia, by developing bi-lateral and multi-lateral working arrangements in which countries work together at a technical level to support efforts to manage plutonium inventories in a way that minimizes the stockpiles of excess plutonium and maximizes the security and protection of the material.

The program also will be responsible for managing enriched uranium supply and demand needs and commitments in support of Defense Nuclear Nonproliferation statutory obligations and mission goals to support the provision of Material for Peaceful Uses. This will include oversight of contractor management of the LEU for the American Assured Fuel Supply (AAFS), research reactor conversion supplies, and supplies to support medical isotope production. These activities support U.S. Government nonproliferation and nuclear security objectives to discourage development of indigenous enrichment and reprocessing capabilities by other countries and minimize the use of HEU in civilian nuclear applications.

FY 2017-FY 2020 Key Milestones

- (Sept 2020) At the Savannah River Site, convert 2,415 cumulative kg of plutonium into oxide for eventual disposition.
- (Sept 2020) At Los Alamos National Laboratory, convert 1,292 cumulative kg of plutonium into oxide for eventual disposition.
- (Sep 2020) Down-blend or ship for down-blending a cumulative total of 165 metric tons of HEU.
- Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Material Disposition $85,000,000	**Material Disposition $82,584,000**	**Material Disposition -$2,416,000**
U.S. Plutonium Disposition $60,000,000	**U.S. Plutonium Disposition $50,504,000**	**U.S. Plutonium Disposition -$9,496,000**
• Continue at a reduced rate to disassemble nuclear weapon pits and convert the resulting plutonium metal into an oxide form using the LANL ARIES process as part of the 2 MT campaign. • Continue processing of existing plutonium metals and oxides in the H-Canyon and HB Line at Savannah River Site (SRS) as part of the 3.7 MT campaign. • Continue to provide storage, surveillance, and packaging capabilities for surplus pits and plutonium at Pantex. • Maintain the WSB facility in a lay-up configuration while the Department completes the analysis of the plutonium disposition options. • Support the ongoing maintenance of critical programmatic documents including the Program Execution Plan, integrated schedules, performance measures, NEPA documentation, memoranda of agreement, analysis for plutonium disposition, and interface control documents; minimal required infrastructure and erosion control maintenance required to comply with safety and environmental standards; and DNN's portion of the SRS-wide common infrastructure maintenance activities including site roads, bridges, barricades, and utility distribution systems.	• Disassemble nuclear weapons pits and convert them into 100 kg of plutonium oxide for eventual disposition. The conversion uses the LANL ARIES process and is part of the 2 MT campaign. • Convert over 250 kg of plutonium into oxide for eventual disposition at the SRS's H-Canyon facility. • Continue to provide storage, surveillance, and packaging capabilities for surplus pits and plutonium at Pantex. • Maintain the WSB facility in a lay-up configuration while the Department completes the independent validation of the plutonium disposition options. • Support the ongoing maintenance of critical programmatic documents including the Program Execution Plan, integrated schedules, performance measures, NEPA documentation, memoranda of agreement, analysis for plutonium disposition, and interface control documents; minimal required infrastructure and erosion control maintenance required to comply with safety and environmental standards; and DNN's portion of the SRS-wide common infrastructure maintenance activities including site roads, bridges, barricades, and utility distribution systems.	The decrease reflects the use of prior-year uncosted balances to maintain the same level of effort work scope as in FY 2015.

[a] These activities were previously performed under Fissile Materials Disposition in FY 2015. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
	FY 2017-FY 2020 • Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.	
U.S. Uranium Disposition $25,000,000	**U.S. Uranium Disposition $31,080,000**	**U.S. Uranium Disposition +$6,080,000**
• Continue to down-blend HEU for research reactor needs in support of reactor conversion efforts. • Complete the 5 MT of the MOX Backup LEU Inventory Project. • Support the de-inventory of Area 5 at Y-12, including removal of Light Water Boiling Reactor (LWBR) fuel rods. • Support production area operations for material processing and packaging of surplus HEU. • Perform services necessary to provide suitable and appropriate certified Type B radioactive material shipping packages for HEU disposition programs. • Prepare unallocated surplus HEU material for future disposition.	• Down-blend or ship for down-blending of HEU to produce LEU consistent with specifications. • Continue to down-blend HEU into high assay LEU metal for research reactors and for Mo-99 target production, in support of replacing current HEU demand for research reactor fuel and medical isotope production with LEU-based solutions. • Support tracking and analyzing enriched uranium supply and demand needs and commitments of Defense Nuclear Nonproliferation mission goals. **FY 2017-FY 2020** • Continue to down-blend surplus HEU in order to meet nonproliferation objectives. • Continue contractor management oversight of the stored LEU inventory.	• The increase supports the addition of the next down-blending campaign.
International Plutonium Disposition $0	**International Plutonium Disposition $1,000,000**	**International Plutonium Disposition +$1,000,000**
• $22.9M was de-obligated from the Russian Fissile Materials Disposition Program for use of prior year balances within DNN as directed by the Consolidated and Furthering Continuing Act, 2015. • Support the management of Russian contracts related to the Gas Turbine-Modular Helium Reactor (GT-MHR) program with remaining uncosted balances.	• Implement plutonium management strategies with international partners. **FY 2017-FY 2020** • Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.	• The increase will support the implementation of plutonium management strategies.

Material Management and Minimization Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Highly Enriched Uranium (HEU) Reactors Converted or Shutdown - Cumulative number of HEU reactors and isotope production facilities converted or verified as shutdown prior to conversion.							
Target	92 facilities	94 facilities	100 facilities	105 facilities	110 facilities	115 facilities	118 facilities
Result	92						
Endpoint Target	By 2035, convert or verify the shutdown prior to conversion of approximately 200 HEU reactors and isotope production facilities. Outyear metrics have been reduced to reflect the policy decision to restrict cost-sharing for scope beyond the original pilot reactors in Russia. The cost assumptions, schedules, scope, and available annual appropriations for M^3 conversion efforts beyond the FYNSP are uncertain enough to make any exact end date highly subject to change in either direction. Note: This performance measure was located under the Global Threat Reduction Initiative program in the FY 2015 Congressional Budget Request.							
Nuclear Material Removed – Cumulative number of kilograms of vulnerable nuclear material (HEU and plutonium) removed or disposed.							
Target	5,207 kg	5,332 kg	5,557 kg	5,809 kg	6,110 kg	6,673 kg	6,800 kg
Result	5,207						
Endpoint Target	By 2022, remove or dispose of 7,000 kilograms of vulnerable nuclear material (HEU and plutonium), enough for approximately 280 nuclear bombs. Note: This performance measure was located under the Global Threat Reduction Initiative program in the FY 2015 Congressional Budget Request.						
U.S. Highly Enriched Uranium (HEU) Down-blended - Cumulative amount of surplus U.S. highly enriched uranium (HEU) down-blended or shipped for down-blending.							
Target	146 MT	150 MT	153 MT	156 MT	159 MT	162 MT	165 MT
Result	146						
Endpoint Target	By the end of FY 2030, complete disposition of 186 MT of surplus HEU. The overall amount of HEU available for down-blending and the rate at which it will be down-blended is dependent upon decisions regarding the U.S. nuclear weapons stockpile, the pace of warhead dismantlement and receipt of HEU from research reactors, as well as other considerations, such as decisions on processing of additional HEU through H-Canyon, disposition paths for weapons containing HEU, etc. Note: As a result of cost efficiencies, FMD is able to increase the HEU throughput at Y-12 to achieve its mission of dispositioning surplus HEU. Note: This performance measure was located under Fissile Material Disposition program in the FY 2015 Congressional Budget Request.						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
U.S. Plutonium Disposition (LANL) - Cumulative kilograms of plutonium metal converted to oxide at Los Alamos National Laboratory.							
Target	692 kg	792 kg	892 kg	992 kg	1,092 kg	1,192 kg	1,292 kg
Result	617						
Endpoint Target	By FY 2028, complete operations for 2 MT (2000 kg) of plutonium converted to oxide.						
	Note: Due to preliminary cost increases and the current budget environment, the Administration is continuing an ongoing analysis to determine whether there are options to complete the mission more efficiently. As a result all activities associated with the current strategy will continue at a reduced rate while the Department completes the ongoing analysis. Performance measure targets will be adjusted to reflect the decision of the path forward for plutonium disposition.						
	Note: This performance measure was located under Fissile Material Disposition program in the FY 2015 Congressional Budget Request.						
U.S. Plutonium Disposition (H-Canyon) - Cumulative kilograms of plutonium converted to oxide at SR H-Canyon.							
Target	180 kg	100 kg	350 kg	800 kg	1,275 kg	1,875 kg	2,415 kg
Result	1						
Endpoint Target	By the end of FY 2022, complete operations for 3.7 MT of plutonium converted to oxide at Savannah River Site.						
	Note: Plutonium oxide production in H-Area was delayed due to an extended restart of the HB-Line Facility Phase 2 Operations.						
	Note: This performance measure was located under Fissile Material Disposition program in the FY 2015 Congressional Budget Request.						

Material Management and Minimization
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	34,141	10,731	7,575	7,575	8,195	7,640	-555
Plant Projects (GPP) (<$10M)	12,725	0	4,150	4,150	4,241	4,334	93
Total, Capital Operating Expenses	**46,866**	**10,731**	**11,725**	**11,725**	**12,436**	**11,974**	**-462**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	26,975	10,731	5,297	5,297	5,414	5,533	+119
ARIES Pit Cutter	7,166	0	2,278	2,278	2,781	2,107	-674
Total, Capital Equipment (including MIE)	**34,141**	**10,731**	**7,575**	**7,575**	**8,195**	**7,640**	**-555**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**12,725**	**0**	**4,150**	**4,150**	**4,241**	**4,334**	**93**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**12,725**	**0**	**4,150**	**4,150**	**4,241**	**4,334**	**93**
Total, Capital Summary	**46,866**	**10,731**	**11,725**	**11,725**	**12,436**	**11,974**	**-462**

Outyears for Material Management and Minimization

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	6,665	5,779	5,906	6,036
Plant Projects (GPP) (<$10M)	4,429	4,526	4,626	4,728
Total, Capital Operating Expenses	**11,094**	**10,305**	**10,532**	**10,764**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	5,655	5,779	5,906	6,036
ARIES Pit Cutter	1,010	0	0	0
Total, Capital Equipment (including MIE)	**6,665**	**5,779**	**5,906**	**6,036**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	4,429	4,526	4,626	4,728
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**4,429**	**4,526**	**4,626**	**4,728**
Total, Capital Summary	**11,094**	**10,305**	**10,532**	**10,764**

Fissile Materials Disposition [a]
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 [b] Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Fissile Materials Disposition					
U.S. Plutonium Disposition	157,557	155,057	60,000	0	-60,000
U.S. Uranium Disposition	**25,000**	**27,500**	**25,000**	**0**	-25,000
Construction					
99-D-141-02 Waste Solidification Building (WSB)	0	0	0	0	+0
99-D-143 MOX Fuel Fabrication Factility (MFFF)	343,500	402,743	345,000	0	-345,000
Subtotal, Construction	**343,500**	**402,743**	**345,000**	**0**	**-345,000**
Russian Surplus Fissile Materials Disposition	**0**	**0**	**0**	**0**	**0**
Total, Fissile Materials Disposition	**526,057**	**585,300**	**430,000**	**0**	**-430,000**

[a] The U.S. Plutonium Disposition, U.S. Uranium Disposition, and the Russia Material Disposition sub-programs within the Fissile Materials Disposition program are being restructured into the Material Management and Minimization program starting in FY 2016. The Construction subprogram within the Fissile Materials Disposition program is being restructured into the Nonproliferation Construction program starting in FY 2016.

[b] Reflects: a reprogramming of $2,500,000.00 from U.S. Plutonium Disposition to U.S. Uranium Disposition for continued downblending of surplus HEU and a reprogramming of $59,242,760 from FY 2013 International Material Protection and Cooperation funding to Fissile Material Disposition in FY 2014.

Nonproliferation and Arms Control [a]

Overview

NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation Research and Development (R&D). The FY 2016 Nonproliferation and Arms Control Budget Request responds to the national security priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, both of which are reflected in the Department of Energy Strategic Plan. These priorities include the efforts to secure or eliminate the world's most vulnerable nuclear weapon materials; dispose of excess nuclear weapon materials in the United States; support the development of new technologies for nonproliferation; promote the secure expansion of nuclear energy; and improve capabilities worldwide to deter and detect the illicit movement of nuclear and radiological materials and technology.

The Nonproliferation and Arms Control (NPAC) program directly contributes to meeting the DOE strategic goal for "Nuclear Security" and plays a critical role in meeting Strategic Objective 6 to reduce global nuclear security threats. The NPAC program supports National Nuclear Security Administration (NNSA) efforts to prevent the proliferation or use of weapons of mass destruction (WMD), including dual-use materials, equipment, technology, and expertise, by state and non-state actors. The NPAC program focuses on strengthening the nonproliferation and arms control regimes in order to reduce proliferation and terrorism risks. This is accomplished by applying unique expertise to develop and implement programs and strategies to: strengthen international nuclear safeguards; control the spread of dual-use WMD material, equipment, technology, and expertise; verify nuclear reductions and compliance with nonproliferation and arms control treaties and agreements; and develop proposals for and implement nonproliferation and arms control policy options. The NPAC program pursues these objectives through four subprograms: (1) Nuclear Safeguards; (2) Nuclear Export Controls; (3) Nuclear Verification; and (4) Nonproliferation Policy.

Highlights of the FY 2016 Budget Request

- Meet standing DOE/NNSA statutory and treaty/agreement obligations and authorities, including: (a) Bilateral physical security assessment visits for U.S.-obligated materials at foreign facilities; (b) Implementation of U.S. safeguards obligations under the U.S. Voluntary Offer Agreement/Additional Protocol; (c) U.S. nonproliferation and export control activities (license reviews, 123 Agreements, 10 CFR Part 810 applications); (d) Provision of safeguards training; and (e) Implementation of DOE obligations under the New START Treaty, Plutonium Production Reactor Agreement, Chemical Weapons Convention and Biological and Toxin Weapons Convention.
- Strengthen the U.S. safeguards technology and human capital base to meet projected U.S. and International Atomic Energy Agency (IAEA) resource requirements.
- Field test and finalize advanced safeguards concepts for Gas Centrifuge Enrichment Plants for transfer to the IAEA.
- Engage 25-35 foreign partners to strengthen national systems of export control and prevent illicit trafficking in WMD commodities through export licensing and enforcement training programs
- Work with other DOE and interagency partners to facilitate the expansion of civil nuclear power while minimizing proliferation risks through global outreach and capability building in nuclear safeguards and export controls. Also, provide nonproliferation assessments of emerging nuclear technologies.
- Maintain technical and manpower readiness for future monitored dismantlement of nuclear programs of concern.

Major Outyear Priorities and Assumptions

Outyear funding levels for the NPAC program total $562,973,000 for FY 2017 through FY 2020. The NPAC program will place increasing emphasis on strengthening the IAEA safeguards regime by revitalizing the U.S. technical and human capital base that supports safeguards and ensuring the application of safeguards norms and best practices internationally. The NPAC program also will provide for export control-related activities that address proliferation by Iran, North Korea, Syria and proliferation networks, strengthen international nonproliferation agreements and standards, and encourage global adherence to and implementation of international nonproliferation requirements. Finally, in collaboration with DNN Research & Development (DNN R&D), the NPAC program will support the development and evaluation of negotiating

[a] This program was known as the Nonproliferation and International Security (NIS) program in the FY 2015 budget and has been renamed.

positions and verification technologies for future nuclear reduction treaties and technologies to support U.S. arms control and nonproliferation initiatives. This includes applied development, testing and evaluation, and deployment of advanced radiation measurement technologies for application under the New START Treaty, as well as other concept-proven technologies for future treaty verification, transparency, and safeguards purposes. In the outyears, NPAC will continue to place emphasis on integrating and collaborating with DNN R&D to ensure the effective implementation of innovative, concept-proven safeguards and verification technologies.

Nonproliferation and Arms Control Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nonproliferation and Arms Control					
Nuclear Verification	**0**	**0**	**0**	**29,273**	**+29,273**
Nuclear Controls	**0**	**0**	**0**	**33,134**	**+33,134**
Nuclear Safeguards and Security	**0**	**0**	**0**	**52,929**	**+52,929**
Nonproliferation Policy	**0**	**0**	**0**	**11,367**	**+11,367**
Total, Nonproliferation and Arms Control	**0**	**0**	**0**	**126,703**	**+126,703**

Nonproliferation and Arms Control Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nonproliferation and Arms Control					
Nuclear Verification	**27,962**	**29,421**	**29,204**	**29,273**	**+69**
Nuclear Controls	**32,991**	**33,723**	**31,924**	**33,134**	**+1,210**
Nuclear Safeguards and Security	**50,366**	**51,421**	**54,450**	**52,929**	**-1,521**
Nonproliferation Policy	**7,123**	**9,951**	**10,281**	**11,367**	**+1,086**
Total, Nonproliferation and Arms Control	**118,442**	**124,516**	**125,859**	**126,703**	**+844**

Outyears for Nonproliferation and Arms Control Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Nonproliferation and Arms Control				
Nuclear Verification	**29,128**	**30,636**	**31,335**	**32,036**
Nuclear Controls	**33,876**	**36,715**	**37,646**	**38,297**
Nuclear Safeguards and Security	**56,327**	**60,903**	**62,478**	**63,869**
Nonproliferation Policy	**11,974**	**12,472**	**12,574**	**12,707**
Total, Nonproliferation and Arms Control	**131,305**	**140,726**	**144,033**	**146,909**

Nonproliferation and Arms Control
Proposed Budget Structure Changes

The FY 2015 Consolidated and Further Continuing Appropriations Act funded Defense Nuclear Nonproliferation (DNN) Activities are under five programs. In FY 2016, NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation R&D. Accordingly, in FY 2016, the NPAC program (formerly the Nonproliferation and International Security {NIS} program) is transferring its two nuclear security capacity-building activities - International Nuclear Forensics Cooperation (formerly Confidence Building Measures) and International Nuclear Security - to the Global Material Security program.

Budget Structure Crosswalk [a]
(Dollars in Thousands)

	Proposed FY 2016 Budget Structure				
	Nonproliferation and Arms Control				
	Nuclear Verification	Nuclear Controls	Nuclear Safegurds and Security	Nonproliferation Policy	Total
FY 2015 Budget Structure					
Nonproliferation and International Security					
Nuclear Verification					
Warhead Dismantlement and Transparency	19,197				**19,197**
Nuclear Noncompliance Verification	10,076				**10,076**
Total, Nuclear Verification	**29,273**				**29,273**
Nuclear Controls					
International Nonproliferation Export Control Program		13,882			**13,882**
Export Control Review and Compliance		15,388			**15,388**
Weapons of Mass Destruction Interdiction		3,864			**3,864**
Total, Nuclear Controls		**33,134**			**33,134**
Nuclear Safeguards and Security					
Safeguards Policy			14,117		**14,117**
Safeguards Engagement			19,056		**19,056**
Safeguards Technology Development			19,056		**19,056**
International Nuclear Security			700		**700**
Total, Nuclear Safeguards and Security			**52,929**		**52,929**
Nonproliferation Policy					
Global Regimes				4,084	**4,084**
Regional Analysis and Engagement				2,000	**2,000**
Multilateral Supplier Policy				5,283	**5,283**
Total, Nonproliferation Policy				**11,367**	**11,367**
Total, Nonproliferation and Arms Control	**29,273**	**33,134**	**52,929**	**11,367**	**126,703**

[a] This table shows the crosswalk from the FY 2015 budget structure to the proposed FY 2016 budget structure for Nonproliferation and Arms Control. A crosswalk that captures all of Defense Nuclear Nonproliferation is included in the Overview section.

Nonproliferation and Arms Control
Explanation of Major Changes (Comparable)
(Dollars in Thousands)

	FY 2016 vs FY 2015
Nuclear Verification: This increase allows for the continued development, testing, evaluation, and deployment of advanced applied technologies and concepts for warhead and fissile material transparency and verification to support arms control treaties and initiatives; and the development, testing and evaluation of verification procedures and technologies for the dismantlement of uranium and plutonium fuel cycle activities in countries of concern. The increase is offset by a decrease in funding resulting from the completion of activities under the 1993 U.S.-Russia HEU Purchase Agreement in FY 2015.	**+69**
Nuclear Controls: This increase in funding provides additional support for statutorily mandated activities (export license and interdiction case reviews), as well as international export control outreach in support of U. S. policy priorities.	**+1,210**
Nuclear Safeguards and Security: This decrease reflects a reduction in funding for certain projects under the NGSI Human Capital Development program that no longer are necessary due to other training and education programs provided in DNN.	**-1,521**
Nonproliferation Policy: This increase allows for the implementation of an export control e-licensing system and other efficiencies to make the NPAC 10 CFR Part 810 application process ISO 9001 compliant; expanded technical analysis to support U.S. Government positions related to the Nuclear Suppliers Group (NSG), Nuclear Non-Proliferation Treaty, and Fissile Material Cut-off Treaty; outreach to promote and implement industry self-regulation within NSG Guidelines; and continued work to support U.S. efforts to guarantee a secure supply of civil nuclear fuel to international partners. The increase is offset by a decrease in funding for Regional Analysis and Engagement activity with China on nonproliferation and nuclear stability issues.	**+1,086**
Total, Nonproliferation and Arms Control	**+844**

Nonproliferation and Arms Control
Nuclear Verification

Description

These activities were previously performed under Nonproliferation and International Security in FY 2015. The Nuclear Verification (NV) subprogram reduces or eliminates proliferation concerns by promoting transparent arms reductions, including through supporting the negotiation and implementation of U.S. nonproliferation and arms control treaties and agreements. The NV subprogram also conducts applied technology development, testing, evaluation and deployment of proven technical concepts to ensure the application of required verification technologies and approaches and associated transparency-monitoring tools, as well as to lay the technical foundation for future nonproliferation and arms control initiatives.

FY 2017-FY 2020 Key Milestones

- (Sept 2017 – Sept 2020) Annually complete monitoring visits in Russia under the terms of the Plutonium Production Reactor Agreement (PPRA) to ensure the secure storage of Russian plutonium oxide and shutdown Russian plutonium production reactors remain in a non-operational status.
- (Sept 2017 – Sept 2020) Annually provide operations planning and maintain short-notice readiness of previously developed technologies and capabilities to support verifiable dismantlement of nuclear programs in countries of proliferation concern.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Verification $29,204,000	**Nuclear Verification $29,273,000**	**Nuclear Verification +$69,000**
• Develop advanced technologies and concepts for future warhead and fissile material transparency and verification regimes, as well as support the implementation of the New START Treaty and future arms control initiatives. • Collaborate with the United Kingdom under the 1958 Mutual Defense Agreement and other partner countries to develop potential common approaches to challenging verification issues and problems. • Conduct monitoring visits in Russia under the terms of the PPRA to ensure the secure storage of Russian plutonium oxide and shutdown Russian plutonium production reactors remain in a non-operational status. • Continue activities related to nuclear testing limitations, including those required to prepare for the ratification and implementation of the Comprehensive Nuclear-Test-Ban Treaty. • Under the Seismic Cooperation Program, provide capacity-building training in seismology to foreign partner institutions to enhance their abilities to detect and analyze possible nuclear explosions, as well as mitigate geophysical hazards. • Maintain accreditation of OPCW laboratory at LLNL. • Maintain short-notice readiness of previously developed technologies and capabilities for	• Develop advanced technologies and concepts for future warhead and fissile material transparency and verification regimes, as well as to support the implementation of the New START Treaty and future arms control initiatives. • Collaborate with the United Kingdom under the 1958 Mutual Defense Agreement and other partner countries to develop potential common approaches to verification issues. • Conduct 3 monitoring visits in Russia under the terms of the U.S.-Russia Plutonium Production Reactor Agreement (PPRA) to ensure that Russian plutonium oxide is stored securely and that shutdown Russian plutonium production reactors remain in a non-operational status. • Continue activities related to nuclear testing limitations, including those required to prepare for the ratification and implementation of the Comprehensive Nuclear-Test-Ban Treaty. • Under the Seismic Cooperation Program, provide capacity-building training in seismology to foreign partner institutions to enhance their abilities to detect and analyze possible nuclear explosions, as well as mitigate geophysical hazards. • Maintain accreditation of the Organization for the Prevention of Chemical Weapons (OPCW) laboratory at Lawrence Livermore National Laboratory (LLNL).	• This increase allows for developing, testing and evaluating verification procedures and technologies for the dismantlement of uranium and plutonium fuel cycle activities in countries of concern. • This increase is offset by a decrease in funding resulting from the completion of activities under the 1993 U.S.-Russia HEU Purchase Agreement in FY 2015. No HEU program budget is being requested in FY 2016 or the outyears.

[a] These activities were previously performed under Nonproliferation and International Security in FY 2015. In FY 2016, these activities are now included under Nonproliferation and Arms Control in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
verifying declarations and denuclearization activities in countries of concern. • Develop technologies and capabilities to address outstanding needs in verification of uranium and plutonium fuel cycles. • Provide assessments and operations planning to support verifiable dismantlement of nuclear programs in countries of proliferation concern. • Complete all transparency monitoring provisions under the U.S.-Russia HEU Purchase Agreement. • Complete assessments of Russian HEU to LEU processing data. • Continue work on U.S. LEU processing data and forms. • Under the terms of the 1993 U.S.-Russia Highly Enriched Uranium Purchase Agreement, support Russian monitoring visits to U.S. nuclear fuel fabrication facilities.	• Provide operations planning and maintain short-notice readiness of previously developed technologies and capabilities to support verifiable dismantlement of nuclear programs in countries of proliferation • Develop, test and evaluate verification procedures and technologies for the dismantlement of uranium and plutonium fuel cycle activities in countries of proliferation concern. • Continue work on U.S. LEU processing data and forms. • Under the terms of the 1993 U.S.-Russia Highly Enriched Uranium Purchase Agreement, support Russian monitoring visits to U.S. nuclear fuel fabrication facilities. **FY 2017-FY 2020** • Continue to develop advanced technologies and concepts for future warhead and fissile material transparency and verification regimes, as well as to support the implementation of the New START Treaty and future arms control initiatives. • Annually complete monitoring visits in Russia under the terms of the PPRA to ensure the secure storage of Russian plutonium oxide and shutdown Russian plutonium production reactors remain in a non-operational status. • Annually maintain accreditation of OPCW laboratory at LLNL through annual proficiency activities. • Annually provide operations planning and maintain short-notice readiness of previously developed technologies and capabilities to support verifiable dismantlement of nuclear programs in countries of proliferation concern.	

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	• Develop, test and evaluate verification procedures and technologies for the dismantlement of uranium and plutonium fuel cycle activities in countries of concern.	

Nonproliferation and Arms Control
Nuclear Controls

Description

These activities were previously performed under Nonproliferation and International Security in FY 2015. The Nuclear Controls (NC) subprogram facilitates nuclear cooperation by building global capacity to prevent the spread of dual-use WMD materials, equipment, and technology. NC does so by implementing programs that: strengthen foreign partner national systems of WMD export control in coordination and consistent with U.S. policy and the multilateral supplier regimes; provide technical and end-user evaluations of dual-use and munitions export license applications; and provide technical support to enhance the U.S. Government capacity to detect and interdict illicit WMD-related commodity technology transfers to foreign programs of concern. The funding request for the International Nuclear Forensics Cooperation Program (formerly the Confidence Building Measures activity) is being moved to the Global Materials Security program.

FY 2017-FY 2020 Key Milestones

- (Sept 2017 - Sept 2020) Annually perform reviews of approximately 6,000 export licenses and requests for dual-use commodities for a total of 24,000 by September 2020.
- (Sept 2017 - Sept 2020) Provide approximately 3,000 comprehensive and real-time commodity assessments per year for a total of 12,000 by September 2020.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Controls $31,924,000	**Nuclear Controls $33,134,000**	**Nuclear Controls +$1,210,000**
• Engage 25-35 foreign partners annually to strengthen national systems of export control and prevent illicit trafficking in WMD commodities through export licensing and enforcement training programs. • Train U.S. export enforcement officials in partnership with the E2C2 established under the Export Control Reform Initiative. • Perform approximately 6,000 technical reviews of export licenses for dual-use commodities; provide state-of-the-art technology assessments to the multilateral control regimes; and provide training courses for DOE and USG officials regarding changing export controlled technologies and proliferation concerns. • Provide approximately 3,000 comprehensive and real-time technical interdiction case analyses per year; and provide unique analytical products regarding proliferation trends and commodity gaps through the Interdiction Technical Analysis Group.	• Engage 25-35 foreign partners to strengthen national systems of export control and prevent illicit trafficking in WMD commodities through export licensing and enforcement training programs. • Train U.S. export enforcement officials in partnership with the Export Enforcement Coordination Center (E2C2) established under the Export Control Reform Initiative and collaborate with the U.S. Customs and Border Protection's (CBP) National Targeting Center. • Perform approximately 6,000 technical reviews of export licenses for dual-use commodities, provide state-of-the-art technology assessments to the multilateral control regimes, and provide training courses for DOE and U.S. Government officials regarding changing export controlled technologies and proliferation concerns. • Provide approximately 3,000 real-time technical interdiction case analyses per year and provide unique analytical products regarding proliferation trends and commodity gaps through the Interdiction Technical Analysis Group and in support of the U.S. Government enforcement community. **FY 2017-FY 2020** • Engage 35-40 foreign partners annually to	• This increase in funding provides additional support for statutorily mandated activities (export license and interdiction case reviews), as well as international export control outreach in support of U.S. policy priorities.

[a] These activities were previously performed under Nonproliferation and International Security in FY 2015. In FY 2016, these activities are now included under Nonproliferation and Arms Control in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	strengthen national export control systems and prevent illicit trafficking in WMD commodities through export licensing and enforcement training programs. • Train U.S. export enforcement officials in partnership with the E2C2 and collaborate with CBP's National Targeting Center. • Perform approximately 6,000 technical reviews of export licenses for dual-use commodities per year. • Provide technical reach back support to the U.S. enforcement community and provide approximately 3,000 real-time technical interdiction case analyses per year.	

Nonproliferation and Arms Control
Nuclear Safeguards and Security

Description

These activities were previously performed under Nonproliferation and International Security in FY 2015. The Nuclear Safeguards (NS) subprogram strengthens the international nuclear safeguards regime. NS manages the Next Generation Safeguards Initiative (NGSI), oversees support for the U.S. Support Program (USSP) to IAEA Safeguards, collaborates with the IAEA and other partners to enhance the implementation of safeguards norms and best practices, assesses the physical protection of U.S.-obligated nuclear material overseas, and oversees implementation of U.S. Additional Protocol (AP) and Voluntary Offer Agreement (VOA) Safeguards activities at DOE sites and facilities.

FY 2017-FY 2020 Key Milestones

- (Sept 2017 – Sept 2020} Deploy a cumulative total of 20 tools to be used in international regimes and by other countries that address an identified safeguards deficiency (5 technologies transferred per fiscal year).
- (Sept 2017 – Sept 2020) Perform a cumulative total of 24 bilateral assessments of the physical security of U.S.-obligated nuclear material located at foreign facilities in order to ensure the security of U.S.-obligated material and reduce the threat of nuclear terrorism.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Safeguards and Security $54,450,000	**Nuclear Safeguards and Security $52,929,000**	**Nuclear Safeguards and Security -$1,521,000**
• Provide expert support to the U.S. Government and the IAEA for the implementation of the State Level Concept, with a focus on identifying and responding to specific technical, methodological and diplomatic barriers to implementation as they arise. • Prepare for a proof-of-concept demonstration of a global identification and monitoring system of UF6 cylinders; field test and finalize advanced safeguards concepts for GCEPs for transfer to the IAEA; and pursue promising cost-effective safeguards approaches for facilities. • Maintain qualified and knowledgeable safeguards staff at the National Laboratories and IAEA in support of the international safeguards regime, through sustainable academic and technical programs manifested through curriculum development; internships, post-grad and grad fellowships; and short courses on safeguards. • Implement U.S.-IAEA safeguards obligations at DOE facilities (including annual reporting requirements). • Provide customized training to more than 25 countries to ensure effective implementation of Comprehensive Safeguards Agreements and Additional Protocols. • Complete quality assessment, gap analysis, and strengthening of nuclear safeguards engagement	• Implement U.S.-IAEA safeguards obligations at DOE facilities including annual reporting requirements as required by U.S. laws and treaty obligations. • Strengthen the international safeguards regime through the implementation of the State Level Concept with a focus on identifying and responding to specific technical, methodological and diplomatic barriers to implementation as they arise. • Demonstrate and transfer new technologies designed to enhance inspector capabilities in high-priority areas such as in-field analysis and detection of undeclared activities at declared facilities. • Test spent fuel non-destructive assay technologies with foreign partners. • Demonstrate proof-of-concept for a global identification and monitoring system of UF6 cylinders; continue field testing and finalizing advanced safeguards concepts for Gas Centrifuge Enrichment Plants (GCEPs) for transfer to the IAEA; pursue promising cost-effective safeguards approaches for declared nuclear facilities; develop an integrated safeguards concept for electrochemical processing based on R&D conducted with international partners; and promote Safeguards by Design as a standard	• This decrease reflects a reduction in funding required for the NGSI Human Capital Development program due to other training and education programs in DNN.

[a] These activities were previously performed under Nonproliferation and International Security in FY 2015. In FY 2016, these activities are now included under Nonproliferation and Arms Control in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
curriculum. • Partner with IAEA and advanced nuclear partners to conduct joint nuclear safeguards outreach to existing partner countries and additional "nuclear newcomer" states. • Develop an integrated safeguards concept for electrochemical processing based on R&D conducted with international partners. • Transfer 5 technologies to foreign partners to meet identified safeguards deficiencies. • Manage the U.S. Support Program (USSP) to IAEA Safeguards. • Transfer spent fuel non-destructive assay technologies to foreign partners and deploy new technologies designed to enhance in-field detection of undeclared activities. • Demonstrate and transfer new technologies designed to enhance inspector capabilities in high-priority areas such as in-field detection and gas centrifuge enrichment plant monitoring. • Maintain support for accredited IAEA Network of Analytical Laboratories (NWAL) at U.S. Laboratories. • Support and strengthen the U.S. National Laboratory's infrastructure to provide certified reference materials to address international nuclear safeguards challenges. • Lead six to eight U.S. Government assessments of the physical protection of U.S.-obligated nuclear materials at foreign facilities.	industry practice. • Provide customized training to more than 25 countries to ensure effective implementation of Comprehensive Safeguards Agreements and Additional Protocols. • Partner with the IAEA and advanced nuclear partners to conduct joint nuclear safeguards outreach to existing partner countries and additional "nuclear newcomer" states. • Maintain qualified and knowledgeable safeguards staff at the U. S. National Laboratories and IAEA through curriculum development, internships and post-grad research positions, and short courses on safeguards. • Lead six to eight U.S. Government assessments of the physical protection of U.S.-obligated nuclear materials at foreign facilities. **FY 2017-FY 2020** • Continue to implement U.S.-IAEA safeguards obligations at DOE facilities as required under U.S law and treaty obligations. • Continue to strengthen the international safeguards regime through the implementation of the State Level Concept. • Continue development of an integrated safeguards concept for electrochemical processing based on R&D conducted with international partners. • Work with a cumulative total of 35-40 international partners to support and enhance nuclear safeguards implementation at all stages of civil nuclear development by the end of FY 2020. • By the end of FY 2020, deploy 20 tools to be used in international regimes and by other countries that address an identified safeguards deficiency (5	

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	technologies transferred per fiscal year). • Develop and refine advanced concepts and approaches to international safeguards that will result in more effective and efficient IAEA verification and that align with the IAEA strategic and long term R&D plans. • Support continued education and training opportunities for mid-career professionals to meet the nonproliferation and safeguards core capability needs of the U.S. National Laboratories. • Annually review the physical security of U.S.-obligated nuclear material located at foreign facilities in order to ensure the security of U.S.-obligated material at foreign facilities and reduce the threat of nuclear terrorism, for a cumulative total of 24 bilateral assessments by the end of FY 2020.	

Nonproliferation and Arms Control
Nonproliferation Policy

Description

These activities were previously performed under Nonproliferation and International Security in FY 2015. The Nonproliferation Policy (NP) subprogram develops proposals for and implements DOE/NNSA options for nonproliferation and arms control policy. It also supports the negotiation and implementation of bilateral and multilateral nonproliferation and arms control agreements and requirements set forth in the Atomic Energy Act of 1954, as amended, and stemming from national nonproliferation initiatives, agreements, and treaties. In addition, the NP subprogram provides DOE/NNSA nonproliferation policy guidance on nuclear technology transfer and nuclear fuel cycle issues and undertakes activities to improve and update multilateral nuclear supplier arrangements and identify supplier vulnerabilities and potential gaps in supplier arrangements, including specifically analysis and implementation of 10 CFR Part 810 – Assistance to Foreign Atomic Energy Activities. The Part 810 regulations implement section 57 b (2) of the Atomic Energy Act of 1954, as amended by section 302 of the Nuclear Nonproliferation Act of 1978, and control the export of unclassified nuclear technology and assistance. These regulations enable civil nuclear trade by ensuring that nuclear technologies and assistance exported from the United States will be used for peaceful purposes. Finally, the NP subprogram supports a small nonproliferation and nuclear stability-focused Track 1.5 engagement with key stakeholders in India, Pakistan, China, and Burma.

FY 2017-FY 2020 Key Milestones

- (Sep 2019) Provide technical assistance for a cumulative total of 8-12 civil nuclear cooperation Section 123 Agreements and their administrative arrangements.
- (Sep 2017 – Sep 2020) Process between 160-200 Part 810 specific authorization applications and requests for amendments, including the provision of end use and technical reviews and review associated specific authorization reports and notifications to ensure activities comply with Part 810 and fall within the scope of the existing license.
- (Sep 2017 – Sep 2020)Review over 400 Part 810 general authorization reports for compliance with Part 810 regulations and respond to requests for determination.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nonproliferation Policy $10,281,000	**Nonproliferation Policy $11,367,000**	**Nonproliferation Policy +$1,086,000**
• Provide technical assistance to the negotiation of two or three Section 123 Agreements for Cooperation and their administrative arrangements per year; and conclude development of a new international framework for civil nuclear cooperation and proceed to implement such framework in government and with industry. • Conduct Track 1.5 engagements in India, Pakistan, China and Burma, and leverage these efforts to build capacity for greater regional, government-to-government cooperation in arms control, non-proliferation, and disarmament issues. • Conduct additional nonproliferation engagement with Burma (3 meetings total). • Broaden Track II engagement with Pakistan on nuclear weapons issues. • Deepen and grow engagement with young S. Asian analysts by hosting 6 additional fellows for training. • Work with the 48 governments of the NSG to strengthen controls on nuclear technology transfers, including amending the NSG Guidelines. • Participate in the Technical Expert Group, which will ensure the NSG control lists remain up to date with advancing technologies. • Support implementation of the concept of industry self-regulation within the NSG Guidelines.	• Provide technical assistance to the negotiation of up to three Section 123 Agreements for Cooperation and their administrative arrangements. • Work with the 48 governments of the Nuclear Suppliers Group (NSG) to strengthen controls on nuclear technology transfers, including amending the NSG Guidelines and ensuring the NSG control lists remain up to date with advancing technologies. • Support implementation of the concept of industry self-regulation within the NSG Guidelines. • Maintain the NSG Information-Sharing System (NISS) and the NISS Forum, which will help coordinate work undertaken under the NSG Technical Experts Group (TEG). • Perform a comprehensive update of the NSG Trigger List and Dual Use Annex Handbooks by December 2015 • Process between 40-50 Part 810 specific authorization applications and requests for amendments, including the provision of end-use and technical reviews. Review specific authorization reports and notification to ensure activities comply with Part 810 and fall within the scope of the existing license. • Review over 100 Part 810 general authorization reports for compliance with Part 810 regulations	• The increase in funding allows: • Expand cooperation on nuclear technology transfer with international partners to ensure that conditions on U.S. technology transfer and retransfer are enforced. • Expand technical analytical support through the convening of quarterly meetings to review proposals to update and amend the NSG Part 1 and Part 2 Control Lists. • Expand capabilities under the NISS to include features to facilitate compliance with NSG Confidentiality policy and implement a mobile platform for the NISS. • Implement and expand the Part 810 e-Authorization system to standardize the application process and of the adjudication of export authorizations. • Expand work with P3 and P5 countries on fissile material transparency issues • The increase is offset by a decrease in funding for Regional Analysis and Engagement activity with China on nonproliferation and nuclear stability issues as well as social media campaigns that strengthen nuclear stability in South Asia.

[a] These activities were previously performed under Nonproliferation and International Security in FY 2015. In FY 2016, these activities are now included under Nonproliferation and Arms Control in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format.

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
• Maintain the NISS and the NISS Forum, which will help coordinate work undertaken under the TEG. • Work with members of the Zangger Committee to strengthen controls on nuclear technology transfers.	and respond to requests for determination. • Implement an e-licensing system to standardize the Part 810 licensing process. • Conduct analyses of the impact of NPT-related developments on NNSA weapons and nonproliferation work and promote DOE/NNSA interests in NPT. • Prepare DOE/NNSA complex for potential FMCT verification. • Expand cooperation with P3 and P5 countries on fissile material transparency. • Conduct Track 1.5 engagements in India, Pakistan, China and Burma, and leverage these efforts to build capacity for greater regional and government-to-government cooperation in arms control, nonproliferation, and disarmament issues. **FY 2017-FY 2020** • Provide technical assistance to up to three Section 123 Agreements for Cooperation and their administrative arrangements per year for a cumulative total of 8-12 agreements by FY 2019. • Work with the 48 governments of the Nuclear Suppliers Group (NSG) to strengthen controls on nuclear technology transfers, including amending the NSG Guidelines and ensuring the NSG control lists remain up to date with advancing technologies. • Support implementation of the concept of industry self-regulation within the NSG Guidelines. • Maintain the NSG Information-Sharing System (NISS) and the NISS Forum, which will help coordinate work undertaken under the TEG. • Process between 40-50 Part 810 specific authorization applications and requests for	

FY 2015 Enacted [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	amendments per year, including the provision of end use and technical reviews. Review specific authorization reports and notification to ensure activities comply with Part 810 and fall within the scope of the existing license. • Review over 100 Part 810 general authorization reports for compliance with Part 810 regulations per year and respond to requests for determination. Implement an e-licensing system to standardize the Part 810 licensing process by the end of the first quarter in FY 2016. • Conduct analyses of the impact of NPT-related developments on NNSA weapons and nonproliferation work and promote DOE/NNSA interests in NPT. • Prepare DOE/NNSA complex for potential FMCT verification regime. • Promote regional stability and confidence building measures in India, Pakistan, China and Burma and engage in the Middle East to manage the consequences of Iran's nuclear future. Focus will include Track 1.5 engagement as well as growth in use of social media, internet video and "big data" to promote confidence building and nonproliferation themes.	

Nonproliferation and Arms Control Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
International Nonproliferation Export Control Program - Cumulative number of countries where International Nonproliferation Export Control Program (INECP) is engaged that have export control systems that meet critical requirements.							
Target	34 countries	35 countries	36 countries	37 countries	38 countries	39 countries	40 countries
Result	34						
Endpoint Target	By the end of FY 2020, 40 of 45 countries where INECP is engaged have export control systems that meet critical requirements, defined as having: (1) control lists consistent with the WMD regimes; (2) initiated outreach to producers of WMD-related commodities; (3) developed links between technical experts and license reviewers and front-line enforcement officers; and (4) begun customization of educational materials and technical guides. Note: This performance measure was located under the Nonproliferation and International Security program in the FY 2015 Congressional Budget Request.						
Russian Weapons-Usable Highly Enriched Uranium (HEU) - Cumulative metric tons of Russian weapons-usable HEU that U.S. experts have confirmed as permanently eliminated from the Russian stockpile under the HEU Purchase Agreement.							
Target	500 metric tons	N/A	N/A	N/A	N/A	N/A	N/A
Result	500						
Endpoint Target	By the end of Q1 FY 2014, 500 metric tons of Russian weapons-usable HEU was confirmed by U.S. experts as permanently eliminated from the Russian stockpile under the HEU Purchase Agreement. This measure has been completed. Note: This performance measure was located under the Nonproliferation and International Security program in the FY 2015 Congressional Budget Request.						
Safeguards Tools - Annual number of safeguards tools deployed and used in international regimes and other countries that address an identified safeguards deficiency.							
Target	5 tools	5 tools	5 tools	5 tools	5 tools	5 tools	5 tools
Result	5						
Endpoint Target	By the end of FY 2020, 63 tools deployed and used in international regimes and other countries that address an identified safeguards deficiency. Note: This performance measure was located under the Nonproliferation and International Security program in the FY 2015 Congressional Budget Request. Nomenclature changed from “safeguards systems deployed” to “safeguards tools deployed” to better reflect the intent of this performance measure which is to deliver a concrete capability to address discrete safeguards challenges.						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020

Reduce Nuclear Terrorism Threat - In order to reduce the threat of nuclear terrorism, evaluate the physical security of U.S. obligated nuclear material located at foreign facilities by conducting bilateral physical security assessment reviews designed to evaluate the adequacy of existing security measures and provide recommendations for enhancing security if necessary.

Target	6 assessments	6 assessments	6 assessments	6 assessments	6 assessments	6 assessments	6 assessments
Result	6						
Endpoint Target	Annually review the physical security of U.S.-obligated nuclear material located at foreign facilities in order to reduce the threat of nuclear terrorism. Note: This performance measure was located under the Nonproliferation and International Security program in the FY 2015 Congressional Budget Request.						

Nonproliferation and Arms Control
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	1,417	1,417	0	0	0	0	0
Plant Projects (GPP) (<$10M)	162	162	0	0	0	0	0
Total, Capital Operating Expenses	**1,579**	**1,579**	**0**	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	1,417	1,417	0	0	0	0	0
Total, Capital Equipment (including MIE)	**1,417**	**1,417**	**0**	**0**	**0**	**0**	**0**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**162**	**162**	**0**	**0**	**0**	**0**	**0**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**162**	**162**	**0**	**0**	**0**	**0**	**0**
Total, Capital Summary	**1,579**	**1,579**	**0**	**0**	**0**	**0**	**0**

Outyears for Nonproliferation and Arms Control

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	0	0	0	0
Plant Projects (GPP) (<$10M)	0	0	0	0
Total, Capital Operating Expenses	**0**	**0**	**0**	**0**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**
Total, Capital Summary	**0**	**0**	**0**	**0**

Defense Nuclear Nonproliferation Research and Development (DNN R&D)

Overview

The FY 2016 Defense Nuclear Nonproliferation Research and Development (DNN R&D) Budget Request demonstrates a direct connection between the proposed activities and national security priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, and reflected in the Department of Energy Strategic Plan. The budget request also highlights the dual crosscutting nature of the DNN R&D program, which serves both the requirements of other elements of the DNN Office as well as external stakeholders. The DNN R&D program directly contributes to meeting the DOE strategic goal for "Nuclear Security" and plays a critical role in meeting Strategic Objective 6 to reduce global nuclear security threats by the innovation of unilateral and multi-lateral technical capabilities to detect, identify, and characterize: 1) foreign nuclear weapons programs, 2) illicit diversion of special nuclear materials, and 3) global nuclear detonations. And as part of the DNN appropriation realignment, the DNN R&D Budget Request reflects an increased emphasis on R&D that supports nuclear counterterrorism activities. In addition, the proposed budget takes into account external views as reflected in the Executive Office of the President's *Nuclear Defense Research and Development (NDRD) Roadmap,* and the 2014 *Defense Science Board (DSB) Task Force Report on Nuclear Treaty Monitoring and Verification Technologies*, as well as broad interagency perspectives to form, prioritize, and implement research investment strategies for nuclear nonproliferation R&D across the interagency.

To meet national and Departmental nuclear security requirements, DNN R&D leverages the unique facilities and scientific skills of the NNSA nuclear security enterprise, other DOE national laboratories, academia, and industry to perform research, conduct technology demonstrations, develop prototypes for integration into operational systems, and develop operational systems.

Highlights of the FY 2016 Budget Request

Relative to FY 2015, the increased funding level in the FY 2016 Budget Request reflects an increase in priority and scope of research supporting nuclear counterterrorism activities within the DNN appropriation. Discrete, multi-year DNN R&D goals to be achieved in FY 2016 include:

- Demonstrate the next generation of technologies and methods to detect uranium-235 production activities
- Demonstrate initial warhead monitoring and chain-of-custody capabilities in support of new arms control commitments
- Demonstrate remote monitoring capabilities for reactor operations
- Deliver nuclear detonation detection satellite payloads in accordance with the negotiated schedule with the United States Air Force (USAF)

Other ongoing DNN R&D activities will continue to advance the state of the art in proliferation detection and nuclear detonation detection capabilities. DNN R&D will expand efforts in nonproliferation and foreign weapons program activity monitoring through a return to on-schedule execution and continued development of a series of national test beds, including capabilities to detect and identify extremely low-yield nuclear detonations with increased confidence. The DNN R&D program will support a broad set of nuclear nonproliferation and security capabilities for special nuclear material (SNM) movement detection and safeguards, threat interdiction, and radiological source replacement. DNN R&D will continue to support a complex multi-discipline and multi-organization warhead measurement campaign with NNSA's Weapons Activities account that, upon completion, will provide a robust future basis for assessing weapons and material accountability capabilities and defining technical limits and opportunities for end-to-end arms control transparency. It will support the payload-side technical integration, pre-launch and on-orbit testing activities for previously delivered payloads in accordance with host satellite schedules. Also, DNN R&D will conduct research in seismic, radionuclide, and detonation forensics to support national capability in terrestrial and airborne monitoring and analysis methods.

Finally, in support of the nuclear counterterrorism activities that are realigned within the DNN account, DNN R&D will execute nuclear and energetic materials characterization experiments and develop advanced diagnostic equipment for nuclear counterterrorism and incident response missions.

Major Outyear Priorities and Assumptions

Outyear funding levels for the DNN R&D program total $1,775,006,000 for FY 2017 through FY 2020. This funding will support DNN R&D in advancing the detection capabilities that address current and projected threats to national security

posed by the proliferation of nuclear weapons and diversion of special nuclear material. The funding also contributes substantially to the success of international nuclear treaties and agreements, which depend, in part, upon having the technical means and policy context to support negotiations and detect non-compliance with existing treaties. Additionally, approximately one-third of this funding is for production of sensors to support the nation's operational nuclear detonation detection and reporting infrastructure through joint programs with the DoD. Finally, the DNN R&D funding supports the advancement of counterterrorism R&D as part of the larger realignment of NCTIR and CTCP activities into DNN.

Defense Nuclear Nonproliferation Research and Development (DNN R&D)
Funding[a]

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014[b] Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Defense Nuclear Nonproliferation R&D[a]					
Proliferation Detection (PD)	230,977	257,192	240,210	251,066	+10,856
Nuclear Detonation Detection (NDD)	167,861	201,885	153,191	168,267	+15,076
Domestic Uranium Enrichment RD&D	0	2,048	0	0	0
Total, Defense Nuclear Nonproliferation R&D	**398,838**	**461,125**	**393,401**	**419,333**	**+25,932**

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR):

- FY 2014 Transferred: SBIR: $6,975; STTR: $997
- FY 2015 Projected: SBIR: $6,233; STTR: $860
- FY 2016 Request: SBIR: $6,784; STTR: $1,018

[a] FY 2014 execution occurred under the old program name, Nonproliferation and Verification Research and Development (R&D)

[b] Reflects: a reprogramming of +$70,011,054.00 from FY 2013 International Material Protection and Cooperation funding to R&D; an appropriation transfer of -$1,800,000.00 from FY 2014 R&D to Domestic Uranium Enrichment Research, Development and Demonstration (DUE RD&D) within Weapons Activities; an internal reprogramming within DNN of +$2,048,070.92 from FY 2013 funds for DUE RD&D; and an appropriations transfer of -$7,971,704.00 of SBIR/STTR funding to the Office of Science.

Outyears for Defense Nuclear Nonproliferation Research and Development Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Defense Nuclear Nonproliferation R&D				
Proliferation Detection (PD)	258,122	264,279	268,336	273,272
Nuclear Detonation Detection (NDD)	172,080	175,895	179,711	183,311
Domestic Uranium Enrichment RD&D	0	0	0	0
Total, Defense Nuclear Nonproliferation R&D	**430,202**	**440,174**	**448,047**	**456,583**

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR):

- FY 2017 Request: SBIR: $7,434; STTR: $1,045
- FY 2018 Request: SBIR: $7,610; STTR: $1,070
- FY 2019 Request: SBIR: $7,733; STTR: $1,087
- FY 2020 Request: SBIR: $7,902; STTR: $1,111

Defense Nuclear Nonproliferation Research and Development
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015
Proliferation Detection (PD): The increase reflects a $28.1 million prioritization of research for nuclear and energetic materials characterization experiments and development of advanced diagnostic equipment development, as part of the larger program realignment of NCTIR and CTCP activities, which were previously funded in the Weapons Activities appropriation, to the Defense Nuclear Nonproliferation appropriation. This increase is partially offset by a $17.2 million return to base funding levels in this subprogram after the one-time Congressional increase in FY 2015 for field experiments demonstrating two FY 2016 NNSA select initiatives in nonproliferation and arms control, including continuity-of-knowledge technologies for warhead monitoring and remote reactor monitoring for plutonium production detection.	**+10,856**
Nuclear Detonation Detection (NDD): The increase reflects full baseline funding to support high priority capabilities for long-range nuclear detonation detection as well as forensics research.	**+15,076**
Total, Defense Nuclear Nonproliferation Research and Development	**+25,932**

Defense Nuclear Nonproliferation Research and Development
Proliferation Detection

Description

The Proliferation Detection (PD) subprogram develops technologies to detect foreign nuclear weapons programs; supports nuclear arms control treaty verification by improving compliance monitoring capabilities, and supports national nuclear security generally, including emergency operations and response, nuclear counterterrorism, radiological source replacement, and interdiction missions. The PD efforts are aligned along these major functional areas: (1) Nuclear Weapons Development and Material Production Detection efforts are targeted towards the detection, location, and characterization of foreign nuclear weapons program activities; (2) Nuclear Weapons and Material Security supports the development of nuclear security and nuclear arms control treaty monitoring and verification tools and applications, as well as operational interdiction, radiological source replacement, and nuclear security efforts across NNSA; (3) Nonproliferation Enabling Capabilities supports a broad R&D base to bring new, cross-cutting technologies to multi-use applications across NNSA and the interagency community, including a field experiment and demonstration program and a university research program. The field demonstration program spirals research around experimental test bed activities to advance technology in support of the nation's treaty verification and monitoring needs. PD's university program is comprised of three consortia which link universities and DOE national laboratories to address basic research gaps in nuclear nonproliferation and security and treaty compliance monitoring.

Also, beginning in FY 2016, PD will have an increased emphasis on supporting nuclear counterterrorism, specifically in nuclear and energetic materials characterization and development of advanced diagnostic equipment. This transfer is part of the larger program realignment of the NCTIR and CTCP programs lines from the Weapons Activities account to DNN.

FY 2017-FY 2020 Key Milestones

- (Oct 2018) Demonstrate new capabilities for detecting weapons production processes.
- (Oct 2018) Demonstrate new capabilities for material security, including warhead monitoring, warhead chain-of-custody, SNM movement detection, and nuclear safeguards.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Proliferation Detection $240,210,000	**Proliferation Detection $251,066,000**	**Proliferation Detection -$10,856,000**
• **Nuclear Weaponization and Material Production Detection** - Provide for advanced sensor and algorithm development around operational testing at the sensor development test bed; achieve 2015 goals to demonstrate technologies and methods for plutonium production detection; demonstrate capability to persistently and remotely monitor nuclear material processing facilities. • **Nuclear Weapons and Material Security -** Implement and test stand-alone capability and demonstrate feasibility on way to achieving 2016 NNSA Strategic Plan goal to demonstrate the End-to-End campaign's initial warhead monitoring and chain-of-custody capabilities in support of new arms control commitments; demonstrate feasibility on the way to achieving 2016 NNSA Strategic Plan initiative to demonstrate remote monitoring capabilities for reactor operations. • **Nonproliferation Enabling Capabilities -** Begin nuclear test monitoring experimentation for seismic source physics in the second of three test beds, each of increasingly complex geologies, as per long-term test plan; ramp up the warhead monitoring and chain-of-custody campaign, as per the 2014 roadmapping documents; support the University Program to address basic gaps in nuclear nonproliferation and treaty compliance monitoring research- fourth year of support for the University of California at Berkeley-led Nuclear Science & Security Consortium (NSSC). Second year of funding for second university Consortium on treaty Verification Technology (CVT).	• Provide for advanced sensor and algorithm development around operational testing at the sensor development test bed; achieve 2016 goals to demonstrate technologies and methods for foreign uranium production detection; demonstrate capability to persistently and remotely monitor nuclear material processing facilities. • Achieve 2016 NNSA Strategic Plan goal to demonstrate the End-to-End campaign's initial warhead monitoring and chain-of-custody capabilities in support of new arms control commitments; achieve 2016 NNSA Strategic Plan initiative to demonstrate remote monitoring capabilities for reactor operations • Prepare for first nuclear test monitoring experiment for seismic source physics in the third (and most geologically complex) of three planned test beds, as per long-term test plan; support the NNSA's portion of the Integrated University Program to address basic gaps in nuclear nonproliferation and treaty compliance monitoring research. • Provide nuclear and energetic materials characterization data to meet requirements of Nuclear Counterterrorism and Incident Response (NCTIR) programs. **FY 2017-FY 2020** • Develop next generation nuclear detection technologies; provide for advanced sensor and algorithm development around operational	• The increase reflects a $28.1million prioritization of research for nuclear and energetic materials characterization experiments and development of advanced diagnostic equipment development as part of the larger program realignment of NCTIR and CTCP activities, which were previously funded in the Weapons Activities appropriation, to the Defense Nuclear Nonproliferation appropriation. This increase is partially offset by a $17.2 million return to base funding levels in this subprogram after the one-time Congressional increase in FY 2015 for field experiments demonstrating two FY 2016 NNSA select initiatives in nonproliferation and arms control, including continuity-of-knowledge technologies for warhead monitoring and remote reactor monitoring for plutonium production detection.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	testing at the sensor development test bed. Demonstrate new capabilities for detecting weapons production processes. • Demonstrate feasibility in achieving 2018 objectives for advanced remote monitoring capabilities for reactor operations. Demonstrate maturing capability in warhead end-to-end monitoring in 2018. Demonstrate new capabilities for material security, including warhead monitoring, warhead chain-of-custody, SNM movement detection, and nuclear safeguards. • Develop and validate cross-cutting models, algorithms, methods, and operational capabilities; conduct nuclear test monitoring experimentation for seismic source physics in the second and third test beds, of increasingly complex geologies, as per long-term test plan; and ramp up the high explosive testing weaponization detection campaign, as per the 2014 roadmapping documents. Conclude assessment of the integrated university program and solicit proposals for follow-on university consortia, if required.	

Description

The Nuclear Detonation Detection (NDD) subprogram develops and builds space sensors for the nation's operational nuclear test treaty monitoring and Integrated Threat Warning/Attack Assessment capabilities; conducts R&D to advance analytic forensic capabilities related to nuclear detonations; and produces and updates the regional geophysical datasets and analytical understanding of waveform and radionuclide signatures to enable operation of the nation's ground-based nuclear detonation monitoring networks.

FY 2017-FY 2020 Key Milestones

- (Sep 2017-2020) Maintain the nation's space based global nuclear detonation detection capability by delivering scheduled sensor payloads and supporting payload-side integration, pre-launch and post-launch testing.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Nuclear Detonation Detection $153,191,000	**Nuclear Detonation Detection $168,267,000**	**Nuclear Detonation Detection +$15,076,000**
• **Surface, Atmospheric, and Space Detonation Detection (using Satellite-Based systems)** - Delivers GBD nuclear detonation detection payloads for Global Positioning System (GPS) block III satellites in accordance with the negotiated schedule with USAF. Support payload-side technical integration, pre-launch and on-orbit testing activities for previously delivered payloads. Continues development of treaty monitoring focused payload and supports integration onto its designated satellite. Continues required engineering development work and satellite interface coordination to support payload design update for subsequent satellite blocks for GBDs and treaty monitoring focused payloads. • **Nuclear Forensics Research** - Conducts research, technology development, and related science to improve pre- and post-detonation technical nuclear forensic capabilities. Develop and test technical means to assess recent origins of bulk samples of SNM. • **Underground, Underwater, and Atmospheric Detonation Detection (using Ground-Based systems)** - Provides research products, with appropriate testing, demonstration, verification, validation, and technical support for use in the U.S. National Data Center and U.S. Atomic Energy Detection System. Continue to integrate products of source physics experiments and other field and laboratory test campaigns into methods to improve event discrimination. Develop analytical improvements that enable sustained level of performance with reduced operator time.	• Deliver GBD nuclear detonation detection payloads for Global Positioning System (GPS) block III satellites in accordance with the negotiated schedule with USAF. Support payload-side technical integration, pre-launch and on-orbit testing activities for previously delivered payloads. Continues development and production of a treaty monitoring focused payload. Continues required engineering development work and satellite interface coordination to support payload design update for subsequent satellite blocks for GBDs and treaty monitoring focused payloads. • Continue baseline schedule for advancing research, technology development, and related science to improve pre- and post-detonation technical nuclear forensic capabilities. Continue to develop and test technical means to assess recent origins of bulk samples of SNM. • Provide research products, with appropriate testing, demonstration, verification, validation, and technical support for use in the U.S. National Data Center and U.S. Atomic Energy Detection System. Continue to integrate products of source physics experiments and other field and laboratory test campaigns into methods to improve event discrimination. Develop analytical improvements that enable sustained level of performance with reduced operator time. **FY 2017-FY 2020** • Deliver GBD nuclear detonation detection payloads for Global Positioning System (GPS) block	• This increase reflects full baseline funding to support high priority capabilities for long-range nuclear detonation detection as well as forensics research. These research outcomes are designed to improve the technical capability of operational assets.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	III satellites in accordance with the negotiated schedule with USAF. Support payload-side technical integration, pre-launch and on-orbit testing activities for previously delivered payloads. Continues development of treaty monitoring focused payload. Continues required engineering development work and satellite interface coordination to support payload design update for subsequent satellite blocks for GBDs and treaty monitoring focused payloads. • Conduct research, technology development, and related science to improve pre- and post-detonation technical nuclear forensic capabilities. Continue to develop and test technical means to assess recent origins of bulk samples of SNM. Address research priorities that undergird the technical capability of operational assets. • Provide research products, with appropriate testing, demonstration, verification, validation, and technical support for use in the U.S. National Data Center and U.S. Atomic Energy Detection System. Continue to integrate products of source physics experiments and other field and laboratory test campaigns into methods to improve event discrimination. Develop analytical improvements that enable sustained level of performance with reduced operator time. Improve geophysical models of seismic signals from underground detonations, and improve technologies to detect radionuclide releases.	

Defense Nuclear Nonproliferation Research and Development
Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Plutonium Production Detection - Cumulative percentage of progress toward demonstrating the next generation of technologies and methods to detect plutonium production activities. (Progress is measured against the baseline criteria and milestones published in the "FY 2006 R&D Requirements Document".)							
Target	95% of progress	100% of progress	N/A	N/A	N/A	N/A	N/A
Result	95						
Endpoint Target	By the end of FY 2015, demonstrate the next generation of technologies and methods to detect plutonium production activities.						
Nuclear Detonation Detection - Annual index that summarizes the status of all NNSA nuclear detonation detection R&D deliveries that improve the nation's ability to detect nuclear detonations.							
Target	90% index	90% index	90% index	90% index	90% index	90% index	90% index
Result	90						
Endpoint Target	Annually achieve timely delivery of NNSA nuclear detonation detection products (90% target reflects good on-time delivery. Index considers factors beyond NNSA's control and impact on customer schedules.)						
Uranium-235 Production Detection - Cumulative percentage of progress toward demonstrating the next generation of technologies and methods to detect uranium-235 enrichment activities. (Progress is measured against the baseline criteria and milestones published in the "FY 2006 R&D Requirements Document".)							
Target	90% of progress	95% of progress	100% of progress	N/A	N/A	N/A	N/A
Result	90						
Endpoint Target	By the end of FY 2016, demonstrate the next generation of technologies and methods to detect uranium-235 production activities.						
Nuclear Weapons and Material Security - The cumulative percentage of progress towards demonstrating improvements in Special Nuclear Material detection, warhead monitoring, chain-of-custody monitoring, safeguards, and characterization capabilities.							
Target	20% of progress	50% of progress	70% of progress	90% of progress	100% of progress	N/A	N/A
Result	20						
Endpoint Target	By the end of FY 2018, achieve 100% cumulative progress toward demonstrating new capabilities for warhead monitoring, warhead chain-of-custody, Special Nuclear Material movement detection, and nuclear safeguards.						

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Nuclear Weaponization and Material Production Detection - Cumulative percentage of progress toward demonstrating improvements in detection and characterization capabilities of nuclear weapons production activities.							
Target	20% of progress	50% of progress	70% of progress	90% of progress	100% of progress	N/A	N/A
Result	20						
Endpoint Target	By the end of FY 2018, achieve 100% cumulative progress toward demonstrating new capabilities detecting uranium and plutonium production and nuclear weaponization processes.						

Defense Nuclear Nonproliferation Research and Development
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	237,652	90,668	47,932	47,932	48,987	50,065	+1,078
Plant Projects (GPP) (<$10M)	3,036	0	990	990	1,012	1,034	+22
Total, Capital Operating Expenses	**240,688**	**90,668**	**48,922**	**48,922**	**49,999**	**51,099**	**+1,100**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	237,652	90,668	47,932	47,932	48,987	50,065	+1,078
Total, Capital Equipment (including MIE)	**237,652**	**90,668**	**47,932**	**47,932**	**48,987**	**50,065**	**1,078**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**3,036**	**0**	**990**	**990**	**1,012**	**1,034**	**+22**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**3,036**	**0**	**990**	**990**	**1,012**	**1,034**	**+22**
Total, Capital Summary	**240,688**	**90,668**	**48,922**	**48,922**	**49,999**	**51,099**	**+1,100**

Outyears for Defense Nuclear Nonproliferation Research and Development

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	51,166	52,292	53,442	54,618
Plant Projects (GPP) (<$10M)	1,057	1,080	1,104	1,128
Total, Capital Operating Expenses	**52,223**	**53,372**	**54,546**	**55,746**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	51,166	52,292	53,442	54,618
Total, Capital Equipment (including MIE)	**51,166**	**52,292**	**53,442**	**54,618**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	1,057	1,080	1,104	1,128
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**1,057**	**1,080**	**1,104**	**1,128**
Total, Capital Summary	**52,223**	**53,372**	**54,546**	**55,746**

Nonproliferation Construction [a]

Overview

The FY 2016 Budget Request supports national security priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, which are reflected in the Department of Energy Strategic Plan. These priorities include the efforts to secure or eliminate the world's most vulnerable nuclear weapon materials; disposing of excess nuclear weapon materials in the United States; supporting the development of new technologies for nonproliferation; promoting the secure expansion of nuclear energy; and improving capabilities worldwide to deter and detect the illicit movement of nuclear and radiological materials.

The Nonproliferation Construction Program directly contributes to meeting the DOE strategic goal for "Nuclear Security" and plays a critical role in meeting Strategic Objective 6 to reduce global nuclear security threats through plutonium disposition.

Highlights of the FY 2016 Budget Request

Plutonium disposition activities will be sustained while the Department conducts the Congressionally mandated independent validation of options for disposing of 34 metric tons of weapon-grade plutonium. The FY 2016 budget of $345 million is the current services projection from the FY 2015 enacted level.

Major Outyear Priorities and Assumptions

Outyear funding levels for the Nonproliferation Construction program total $884,000,000 for FY 2017 through FY 2020. The FY 2017-2020 estimates are the FY 2015 FYNSP levels, pending the results of further analyses. The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) construction project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a FFRDC, to perform these analyses. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition.

The Program plays a key role in supporting the Secretary's goal of enhancing nuclear security commitments made by the United States and our international partners and will ensure that surplus fissile materials in the U.S. and Russia are disposed of in accordance with the amended U.S.-Russia PMDA.

[a] This is a new structure change for FY 2016. The Nonproliferation Construction program consolidates construction costs for DNN programs previously contained within each program budget. U.S. Construction covers Total Project Costs (TPC), which includes Other Project Costs (OPC) and Total Estimated Costs (TEC), for the MOX Fuel Fabrication Facility (MFFF). These activities were previously shown in the Fissile Materials Disposition program. Any future line item construction projects would be requested under this structure.

Nonproliferation Construction
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nonproliferation Construction					
U.S. Construction					
99-D-143 MOX Fuel Fabrication Factility (MFFF)					
MFFF - OPC	0	0	0	10,000	+10,000
MFFF - TEC	0	0	0	335,000	+335,000
Total, 99-D-143, MFFF	**0**	**0**	**0**	**345,000**	**345,000**
99-D-141-02 Waste Solidification Building (WSB)					
WSB - OPC	0	0	0	0	0
WSB - TEC	0	0	0	0	0
Total, 99-D-141-02 WSB	**0**	**0**	**0**	**0**	**0**
Total, U.S. Construction	**0**	**0**	**0**	**345,000**	**+345,000**

Nonproliferation Construction
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nonproliferation Construction					
U.S. Construction					
99-D-143 MOX Fuel Fabrication Factility (MFFF)					
MFFF - OPC	40,000	40,000	10,000	10,000	0
MFFF - TEC	343,500	402,743	335,000	335,000	0
Total, 99-D-143, MFFF	383,500	442,743	345,000	345,000	0
99-D-141-02 Waste Solidification Building (WSB)					
WSB - OPC	20,000	20,000	0	0	0
WSB - TEC	0	0	0	0	0
Total, 99-D-141-02 WSB	**20,000**	**20,000**	**0**	**0**	**0**
Total, U.S. Construction	**403,500**	**462,743**	**345,000**	**345,000**	**0**

Outyears for Nonproliferation Construction Funding

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Nonproliferation Construction				
U.S. Construction				
99-D-143 MOX Fuel Fabrication Factility (MFFF)				
MFFF - OPC	25,000	25,000	25,000	25,000
MFFF - TEC	196,000	196,000	196,000	196,000
Total, 99-D-143, MFFF	221,000	221,000	221,000	221,000
99-D-141-02 Waste Solidification Building (WSB)				
WSB - OPC	0	0	0	0
WSB - TEC	0	0	0	0
Total, 99-D-141-02 WSB	**0**	**0**	**0**	**0**
Total, U.S. Construction	**221,000**	**221,000**	**221,000**	**221,000**

Nonproliferation Construction
Proposed Budget Structure Changes

The FY 2015 Consolidated Appropriations Act funded Defense Nuclear Nonproliferation (DNN) Activities under five programs. NNSA proposes to restructure the budgets managed by the Office of Defense Nuclear Nonproliferation into the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation Research and Development (R&D).

The Nonproliferation Construction program consolidates construction costs for DNN programs previously contained within each program budget. U.S. Construction covers Total Project Costs (TPC), which includes Other Project Costs (OPC) and Total Estimated Costs (TEC), for the MOX Fuel Fabrication Facility (MFFF), previously shown in the Fissile Materials Disposition program, are now included under this new program.

Budget Structure Crosswalk[a]
Proposed FY 2016 Budget Structure

(Dollars in Thousands)

	Nonproliferation Construction	
	U.S. Construction	**Total**
FY 2015 Budget Structure		
U.S. Fissile Materials Disposition		
U.S. Plutonium Disposition		
Waste Solidification Buildings (WSB) - Other Project Costs (OPC)	0	0
Subtotal, U.S Plutonium Disposition	**0**	**0**
Construction		
99-D-141-02 Waste Solidification Buildings (WSB)	0	0
99-D-143 MOX Fuel Fabrication Facility (MFFF)		
99-D-143 MOX Fuel Fabrication Facility (MFFF) OPC	10,000	10,000
99-D-143 MOX Fuel Fabrication Facility (MFFF) TEC	335,000	335,000
Subtotal, Construction	345,000	**345,000**

[a] The Budget Structure Crosswalk is for the Nonproliferation Construction activities only. The full crosswalk for the Defense Nuclear Nonproliferation (DNN) program can be found in the DNN Overview Section.

Nonproliferation Construction Projects
Explanation of Major Changes (Comparable)
(Dollars in Thousands)

	FY 2016 vs FY 2015
Nonproliferation and Construction Projects	
U.S. Construction – No funding change.	**0**
Total, Nonproliferation Construction Projects	**0**

Nonproliferation Construction
U.S. Construction

Description

These activities were previously performed under Fissile Materials Disposition program in FY 2015. In FY 2016, these activities are now included under Nonproliferation Construction in order to strengthen program effectiveness by realigning similar programs, subprograms, and activities. The FY 2015 activities and funding are shown here in comparable format. The goal of the current Nonproliferation Construction program is to construct facilities to dispose of at least 34 metric tons (MT) of surplus U.S. weapon-grade plutonium in accordance with U.S. policy and the amended U.S.-Russia Plutonium Management and Disposition Agreement (PMDA). The program has been constructing the Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF), which would enable the Department to dispose of weapon-grade plutonium by fabricating it into MOX fuel and irradiating it in commercial nuclear reactors.

During FY 2013, activities associated with the current plutonium disposition strategy were slowed while the Department conducted an analysis of options to complete the mission more efficiently. The Secretary established a Plutonium Disposition Working Group in June 2013 to undertake this options analysis. The working group analyzed the current disposition approach of disposing of surplus weapon-grade plutonium as MOX fuel in light water reactors (LWRs), fast reactor options to dispose of weapon-grade plutonium, and non-reactor based options. In the course of this analysis, it was determined that the MOX fuel approach is significantly more expensive than anticipated, even with consideration of potential contract restructuring and other improvements that have been made to the MOX project. Additionally, the United States Army Corps of Engineers (USACE) conducted an independent assessment of the MOX project and preliminarily concluded that the MOX project would cost approximately $10 - $13 billion to complete in the 2027 - 2031 timeframe with annual funding profile of $500 million for the project. This estimate does not represent a validated baseline but is the most current estimate available at this time.

All four Congressional committees of jurisdiction directed that construction on the MOX project continue in FY 2015 and that cost studies and technology alternative studies be conducted. As a result, the FY 2016 budget request for the Mixed Oxide Fuel Fabrication Facility (MOX) project is $345 million to sustain activities in plutonium disposition. The FY 2016 budget of $345 million is the current services projection from the FY 2015 enacted level. The FY 2017-2020 estimates are the FY 2015 FYNSP levels, pending the results of further analyses. The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) construction project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a FFRDC, to perform these analysis. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition.

The program has also been constructing the Waste Solidification Building (WSB) to handle the waste streams from the MOX facility. The WSB project is currently scheduled to complete August 2015 and will be placed in a lay-up configuration as the Department completes the independent validation of plutonium disposition options and until it is required for MOX cold start-up activities.

In addition, an independent analysis of the underlying causes of the MOX and WSB cost increases has been completed. This report identified recommended actions that address the root causes and can be used as lessons learned for future projects as directed in the Consolidated Appropriations Act, 2014 (Public Law 113-76). The report detailed many contributing factors to the cost increases for the MOX and WSB projects, but indicated that the following are the root causes: the project teams did not have enough experienced federal or contractor staff; atrophy of the nuclear industry and supply chain resulting in loss of nuclear/NQA-1 experience and expertise; and, lack of alignment of contract incentives to best support project execution.

MFFF – OPC
This activity supports all other costs related to a project that are not included in the total estimated cost (TEC). OPCs include, but are not limited to: research and development, conceptual design and conceptual design report, cold start-up and commissioning costs, NEPA documentation, project data sheet preparation, siting, and permitting requirements. These costs are part of the approved baseline and the total project cost (TPC) of the project.

MFFF – TEC
This activity supports the design, long-lead equipment procurement, site preparation, and construction of the MFFF.

FY 2017-FY 2020 Key Milestones
U.S. Construction
- Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.

U.S. Construction

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted[a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
U.S. Construction $345,000,000	**U.S. Construction $345,000,000**	**U.S. Construction $0**
MOX Fuel Fabrication Facility (MFFF) $345,000	**MOX Fuel Fabrication Facility (MFFF) $345,000**	**MOX Fuel Fabrication Facility (MFFF) $0**
MFFF OPC $10,000,000 • Continue management oversight and licensing activities. • Complete the independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium.	***MFFF OPC $10,000,000*** • Continue management oversight and licensing activities. **FY 2017-FY 2020** • Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.	***MFFF OPC $0*** • No funding change.
MFFF TEC $335,000,000 • Continue construction activities to include HVAC construction, process piping, fire protection, electrical, coatings, and glovebox and process equipment installation.	***MFFF TEC $335,000,000*** • Sustain activities in plutonium disposition. **FY 2017-FY 2020** • Scope and costs will be refined in subsequent budget submissions to reflect the funding profile associated with the final plutonium disposition strategy.	***MFFF TEC $0*** • No funding change.

[a] The Nonproliferation Construction program consolidates construction costs for DNN programs previously contained within each program budget. U.S. Construction covers Total Project Costs (TPC), which includes Other Project Costs (OPC) and Total Estimated Costs (TEC), for the MOX Fuel Fabrication Facility (MFFF), previously shown in the Fissile Materials Disposition program, are now included under this new program.

Nonproliferation Construction Projects Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Waste Solidification Building (WSB) - Cumulative percentage of the design, construction, and cold start-up activities completed for the Waste Solidification Building (WSB).							
Target	91% complete	100% complete	N/A	N/A	N/A	N/A	N/A
Result	99						
Endpoint Target	By FY 2015, complete design, construction, and cold start-up activities for the WSB.						
	Note: This performance measure was located under Fissile Material Disposition program in the FY 2015 Congressional Budget Request.						
Mixed Oxide (MOX) Fuel Fabrication Facility - Cumulative percentage of the design, construction, and cold start-up activities completed for the Mixed Oxide (MOX) Fuel Fabrication Facility.							
Target	TBD % complete	TBD	TBD	TBD	TBD	TBD	TBD
Result	N/A						
Endpoint Target	TBD						
	Note: Performance measure targets will be adjusted to reflect the decision of the path forward for plutonium disposition.						
	Note: This performance measure was located under Fissile Material Disposition program in the FY 2015 Congressional Budget Request.						

Nonproliferation Construction
Construction Projects Summary[b]

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
99-D-143, MOX Fuel Fabrication Facility (MFFF)							
Total Estimated Cost (TEC)	10,251,519	3,856,777	343,500	402,743	335,000	335,000	0
Other Project Cost (OPC)	2,439,333	270,333	40,000	40,000	10,000	10,000	0
Total, 99-D-143, MOX Fuel Fabrication Facility (MFFF)	**12,690,852**	**4,127,110**	**383,500**	**442,743**	**345,000**	**345,000**	**0**

Outyears to Completion for Material Management[a]

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
99-D-143, MOX Fuel Fabrication Facility (MFFF)				
Total Estimated Cost (TEC)	196,000	196,000	196,000	196,000
Other Project Cost (OPC)	25,000	25,000	25,000	25,000
Total, 99-D-143, MOX Fuel Fabrication Facility (MFFF)	**221,000**	**221,000**	**221,000**	**221,000**

[a] The FY 2016 budget of $345 million is the current services projection from the FY 2015 enacted level. The FY 2017-2020 estimates are the FY 2015 FYNSP levels, pending the results of further analyses. The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) construction project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a FFRDC, to perform these analysis. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition.

[b] Prior year funding was appropriated under Fissile Materials Disposition.

99-D-143, Mixed Oxide (MOX) Fuel Fabrication Facility,
Savannah River Site (SRS), Aiken, South Carolina
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

This construction Project Data Sheet (CPDS) is an update of the FY 2015 CPDS and does not include a new start for the budget year.

During FY 2013, the Administration slowed activities associated with the current plutonium disposition strategy while it conducted an analysis of options to complete the mission more efficiently. In the course of this analysis, it was determined that the MOX fuel approach is significantly more expensive even with consideration of potential contract restructuring and other improvements that have been made to the MOX project.

The FY 2015 National Defense Authorization Act and the FY 2015 Consolidated and Further Continuing Appropriations Act each directed the Department to conduct additional analyses of the Mixed Oxide Fuel Fabrication Facility (MFFF) project, including independent cost and schedule estimates as well as an analysis of alternative approaches for disposition of the 34 metric tons of weapons grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a FFRDC, to perform these analyses. These analyses will be completed during FY 2015, and a decision will be reached on outyear funding levels for plutonium disposition. The FY 2016 budget of $345 million is the current services projection from the FY 2015 enacted level. The FY 2017-2020 estimates are the FY 2015 FYNSP levels, pending the results of further analyses.

The United States Army Corps of Engineers (USACE) conducted an independent assessment of the MOX project and preliminarily concluded that the MOX project would cost approximately $10 - $13 billion to complete in the 2027 - 2031 timeframe with annual funding of $500 million for the project. The costs in this CPDS are based on near term commitments while the directed analyses are ongoing. To complete project construction, an updated baseline change proposal based on a DOE provided funding profile would have to be submitted by the contractor and validated by the Department prior to its approval by the Deputy Secretary of Energy per DOE Order 413.3B.

In addition, an independent analysis of the underlying causes of the MOX cost increases has been completed. This report identified recommended actions that address the root causes of the cost increases and can be used as lessons learned for future projects as directed in the Consolidated Appropriations Act, 2014 (Public Law 113-76). The report detailed many contributing factors to the cost increases for the MOX project, but indicated the following are the root causes: the project teams did not have enough experienced federal or contractor staff; atrophy of the nuclear industry and supply chain resulting in loss of nuclear/NQA-1 experience and expertise; and, lack of alignment of contract incentives to best support project execution. In addition, the report also provided the following recommended actions to address the underlying root causes: focus responsibilities for project execution with DOE/NNSA organizations that have requisite project management capabilities and experience; improve the training for Headquarters and Field project team personnel in key areas of contract management and project management and control; supplement DOE and NNSA staff with appropriately skilled and experienced personnel; closely align the project and contract management functions, both organizationally and procedurally, to ensure project delivery contracts are structured and adequately incentivized so project objectives and goals can be efficiently attained; and require improved up-front planning (DOE and contractor) to recognize and understand the nuclear construction market dynamics and associated project risks, including the availability of critical components and skilled labor to avoid delays and price escalation.

In FY 2016, the Department is requesting that funding for both Other Project Costs (OPC) and Total Estimated Cost (TEC) be specifically appropriated for the MOX project under a single Congressional control point. The funds are being requested this way in order to remain consistent with how the funds were appropriated by Congress in FY 2015.

Summary

The most recent Department of Energy (DOE) Order 413.3B approved Critical Decision (CD) is CD-3, Start of Construction, and was approved on April 11, 2007, with a Total Project Cost (TPC) of $4,814,329 and CD-4 of Fiscal Year (FY) 2016. Construction began on August 1, 2007, as directed by the Revised Continuing Resolution, 2007, Public Law 110-5. The latest approved baseline change was on December 17, 2008, with a TPC of $4,857,129 and CD-4 of FY 2017.

A Federal Project Director has been assigned to this project and has approved this CPDS.

FY 2014 Project Status
In FY 2014, the overall scope was focused on advancing completion of the first and second floor of the aqueous processing (AP) area and the first floor of the manufacturing dry process (MP) area to support the overall project critical path based on engineering and glovebox/equipment requirements and procurement activities. Construction activities in FY 2014 included setting a prefabricated pipe module in the active gallery; installation of dampers, duct and HVAC supports; installation of process pipe and the associated chemical commodity equipment; and installation of electrical equipment and cable trays.

FY 2015 Planned Description of Activities
In FY 2015, the overall scope continues to be focused on advancing completion of the first and second floors of the AP area and the first and second floors of the MP area to support the overall project critical path, including required glove box and equipment procurement activities. Construction activities include continuing to set prefabricated pipe modules in the active gallery; installation of dampers, duct and HVAC supports; process system and glovebox installation; and installation of process pipe and the associated chemical commodity equipment. The electrical installation scope is to support multi-discipline work sequencing. Procurement of engineered equipment will ramp down. Major equipment, including the furnaces and gloveboxes, will be received. NNSA's Office of Acquisition and Project Management (OAPM) would initiate make or buy analysis to self- perform the remaining non-nuclear support buildings and infrastructure.

FY 2016 Planned Description of Activities
In FY 2016, the overall scope would continue a current services level of activity to support plutonium disposition.

2. Critical Milestone History

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2000	N/A		2QFY1999	N/A	4QFY2001	1QFY2002	N/A	4QFY2005
FY 2001	N/A		2QFY1999	N/A	3QFY2002	4QFY2002	N/A	1QFY2006
FY 2002	N/A		2QFY1999	N/A	4QFY2002	2QFY2003	N/A	1QFY2007
FY 2003	N/A		2QFY1999	N/A	4QFY2003	2QFY2004	N/A	4QFY2007
FY 2004	N/A		2QFY1999	N/A	1QFY2004	2QFY2004	N/A	4QFY2007
FY 2005	N/A		2QFY1999	N/A	3QFY2004	3QFY2005	N/A	2QFY2009
FY 2006	N/A		2QFY1999	N/A	1QFY2005	3QFY2005	N/A	TBD
FY 2007 PB	N/A		2QFY1999	N/A	4QFY2009	2QFY2007	N/A	4QFY2014
FY 2008	1QFY1997		2QFY1999	2QFY2007	2QFY2011	2QFY2007	N/A	4QFY2013
FY 2009	1QFY1997		03/22/1999	04/11/2007	2QFY2013[a]	04/11/2007[b]	N/A	4QFY2016
FY 2010	1QFY1997		03/22/1999	04/11/2007	2QFY2013	04/11/2007	N/A	1QFY2017
FY 2011	1QFY1997		03/22/1999	04/11/2007	2QFY2013	04/11/2007	N/A	1QFY2017
FY 2012	1QFY1997		03/22/1999	04/11/2007	2QFY2013	04/11/2007	N/A	1QFY2017
FY 2013	1QFY1997		03/22/1999	04/11/2007	2QFY2013	04/11/2007	N/A	1QFY2017
FY 2014	1QFY1997		03/22/1999	04/11/2007	4QFY2014	04/11/2007	N/A	TBD[c]
FY 2015	1QFY1997		03/22/1999	04/11/2007	4QFY2016	04/11/2007	N/A	TBD[c]
FY 2016	1QFY1997	10/31/1997	03/22/1999	04/11/2007	4QFY2016	04/11/2007	N/A	4QFY2031[c]

CD-0 – Approve Mission Need for a construction project with a conceptual scope and cost range
Conceptual Design Complete – Actual date the conceptual design was completed (if applicable)
CD-1 – Approve Design Scope and Project Cost and Schedule Ranges
CD-2 – Approve Project Performance Baseline
Final Design Complete – Estimated/Actual date the project design will be/was complete(d)
CD-3 – Approve Start of Construction
D&D Complete –Completion of D&D work (see Section 9)
CD-4 – Approve Start of Operations or Project Closeout
PB – Indicates the Performance Baseline

[a] Facility, process, and equipment design have been completed.
[b] The Department approved CD-3 (Start of Construction) on April 11, 2007, however, as directed by the Revised Continuing Resolution, 2007, Public Law 110-5, construction began on August 1, 2007.
[c] Schedules, dates, and costs will be updated to reflect the decision on the path forward for plutonium disposition.
[d] These completion dates reflects the high end range from the preliminary estimate done by the U.S. Army Corps of Engineers in 2013 at a $500M annual funding limit. An updated baseline will need to be validated and approved per DOE Order 413.3B in order to confirm it.

(fiscal quarter or date)

	Performance Baseline Validation	CD 2A/3A	CD 2B/3B
FY 2005	N/A	09/30/2005	N/A
FY 2006	07/07/2006	N/A	N/A
FY 2007	N/A	N/A	04/06/2006

CD 2A/3A - Approval to start Site Preparation
CD 2B/3B - Approval to begin long lead procurements ("trapped" tanks, steel embeds, reinforcing steel, barrier doors)

3. Project Cost History

(fiscal quarter or date)

	TEC, Design	TEC, Construction	TEC, Total	OPC, Except D&D	OPC, D&D	OPC, Total	TPC
FY 2000	TBD	TBD	383,186	0	N/A	TBD	N/A
FY 2001	TBD	TBD	383,186	0	N/A	TBD	N/A
FY 2002	TBD	TBD	TBD	TBD	N/A	TBD	N/A
FY 2003	TBD	TBD	TBD	TBD	N/A	TBD	N/A
FY 2004	TBD	TBD	TBD	TBD	N/A	TBD	N/A
FY 2005	TBD	TBD	TBD	TBD	N/A	TBD	N/A
FY 2006	TBD	TBD	TBD	TBD	N/A	TBD	N/A
FY 2007	TBD	TBD			N/A		
PB			3,277,984	354,108		354,108	3,632,092
FY 2008	TBD	TBD	3,868,628	830,701	N/A	830,701	4,699,329
FY 2009	TBD	TBD	3,938,628	875,701	N/A	875,701	4,814,329
FY 2010	TBD	TBD	3,975,828	881,301	N/A	881,301	4,857,129
FY 2011	960,925	3,014,903	3,975,828	881,301	N/A	881,301	4,857,129
FY 2012	978,073	2,997,755	3,975,828	881,301	N/A	881,301	4,857,129
FY 2013	994,073	2,981,755	3,975,828	881,301	N/A	881,301	4,857,129
FY 2014	TBD	TBD	TBD	TBD	N/A	TBD	TBD
FY 2015	TBD[a]	TBD[a]	TBD[a]	TBD[a]	N/A	TBD[a]	TBD[a]
FY 2016	1,072,430[b]	9,179,089[a]	10,251,519[a]	2,439,333[a]	N/A	2,439,333[a]	12,690,852

4. Project Scope and Justification,

Scope:
The MOX Fuel Fabrication Building is a multi-functional complex containing all of the plutonium handling, fuel processing and fuel fabrication operations of the MFFF. The building is a multi-story, hardened, reinforced concrete structure. The building includes the Aqueous Polishing Area: comprised of the dissolution, purification and conversion areas; MOX Processing Area : comprised of the blending and milling area, pelletizing area, sintering area, grinding area, fuel rod fabrication area, fuel bundle assembly area, storage areas; the Shipping and Receiving Area ; and a laboratory area.

[a] Schedules, dates, and costs will be updated to reflect the decision resulting from the assessment in the outyears. This cost estimate reflects the preliminary estimate of the independent assessment of the U.S. Army Corps of Engineers in 2013 at a $500M annual funding limit. An updated baseline will need to be validated and approved per DOE Order 413.3B in order to confirm it.
[b] Schedules, dates, and costs will be updated to reflect the decision resulting from the assessment in the out years.

Support equipment (e.g., heating, ventilation and air-conditioning [HVAC] components; high-efficiency particulate air [HEPA] filter plenums; inverters; switchgear; pumps) is also within the MOX Fuel Fabrication Building. The MOX Fuel Fabrication Building also includes features such as a vent stack, stair towers, a Secondary Alarm Station on the roof and a Special Nuclear Materials (SNM) processing area with requisite security measures to hinder any attempts to remove the SNM from the facility.

Several support facilities and infrastructure are also included in the scope of the project. These include the Emergency Diesel Generator Building (11,000 square feet), Technical Support Building (75,000 square feet), Administration Building (56,000 square feet), Secured Warehouse Building (20,000 square feet), Reagents Processing Building (9,000 square feet), Process Assembly Facility (102,000 square feet) and Entry Control and Security Infrastructure (guard house and PIDAS).

Justification:
The overall project mission need is to dispose of at least 34 metric tons of surplus weapon-grade plutonium in accordance with the amended *US-Russia Plutonium Management and Disposition Agreement.* The MFFF would accomplish this by converting the surplus material into mixed oxide fuel that could subsequently be irradiated in power producing reactors in the United States. Once irradiated and converted into spent fuel, the material could no longer be readily used for nuclear weapons.

The U.S. MFFF at the SRS would combine surplus weapon-grade plutonium oxide with depleted uranium oxide to form MOX fuel assemblies to be used as fuel for U.S. commercial nuclear reactors. The nominal design life of the facility would be 40 years; however, it would take approximately 15 years to complete the 34 MT mission. After completing its mission, the facility could be deactivated, decontaminated, and decommissioned in approximately three to four years.

On April 29, 2014, the Department released the working group's preliminary study of potential disposition options which will serve as a basis for evaluating the best path forward for plutonium disposition. The options analyzed included the MOX fuel approach, irradiation of plutonium fuel in fast reactors, and non-reactor options. The non-reactor options included immobilization with high-level waste, down-blending and disposal, and deep borehole disposal.

An independent validation of the results of the preliminary analysis of plutonium disposition options is expected to be completed at the end of FY 2015. Subject to the results of this validation, the contractor will be requested to submit an updated baseline change proposal (BCP). Upon validation of the BCP through an Independent Cost Estimate, the BCP would be thoroughly reviewed and submitted to the Deputy Secretary of Energy for approval as the Secretarial Acquisition Executive per DOE Order 413.3B. Additionally, the contactor will be requested to submit a Contract Change Proposal to the Head Contracting Authority to extend and align the existing contract. Based on experience with projects of this size and complexity, this entire set of processes—conducted concurrently--would take approximately eighteen (18) to twenty-four (24) months.

Contingency Justification:
A revised risk assessment would be conducted in conjunction with the development of the BCP. In accordance with DOE O 413.B, Program and Project Management for the Acquisition of Capital Assets, project contingency (Federal and contractor) would be developed based on the risks identified during the baseline process. As part of the USACE independent cost assessment of the MOX project, a contingency range was included with the preliminary cost range.

The project is being conducted in accordance with the project management requirements in DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets, and all appropriate project management requirements have been met.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 1999	N/A	N/A	2,545
FY 2000	N/A	N/A	33,512
FY 2001	N/A	N/A	29,938
FY 2002	N/A	N/A	52,513
FY 2003	N/A	N/A	82,022
FY 2004	N/A	N/A	93,457
FY 2005	N/A	N/A	216,801
FY 2006	N/A	N/A	165,618
FY 2007	N/A	N/A	62,342
FY 2008 [a]	N/A	N/A	58,958
FY 2009 [b]	N/A	N/A	68,395
FY 2010	N/A	N/A	65,056
FY 2011	N/A	N/A	50,757
FY 2012	N/A	N/A	34,642
FY 2013	N/A	N/A	24,445
FY 2014 Reprogramming	N/A	N/A	0
FY 2014	N/A	N/A	19,789
FY 2015	N/A	N/A	10,000
FY 2016	N/A	N/A	1,640
Total, Design	N/A	N/A	1,072,430
Construction			
FY 2004	N/A	N/A	0
FY 2005	N/A	N/A	0
FY 2006	N/A	N/A	15,210
FY 2007	N/A	N/A	115,065
FY 2008 [a]	N/A	N/A	209,174
FY 2008 (rescinded PY unobligated balance)	N/A	N/A	0
FY 2009 [b]	N/A	N/A	301,323
FY 2010	N/A	N/A	429,326
FY 2011	N/A	N/A	482,330
FY 2012	N/A	N/A	671,212
FY 2013	N/A	N/A	476,204
FY 2014 Reprogramming	N/A	N/A	0
FY 2014	N/A	N/A	301,777

[a] MOX funded within the Nuclear Energy appropriation.
[b] MOX funded with the Other Defense Activities appropriation.

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2015	N/A	N/A	317,476
FY 2016	N/A	N/A	427,524
FY 2017	N/A	N/A	225,988
FY 2018	N/A	N/A	218,269
FY 2019	N/A	N/A	210,761
FY 2020	N/A	N/A	200,858
FY 2021	N/A	N/A	TBD
FY 2022	N/A	N/A	TBD
FY 2023	N/A	N/A	TBD
FY 2024	N/A	N/A	TBD
FY 2025	N/A	N/A	TBD
FY 2026	N/A	N/A	TBD
FY 2027	N/A	N/A	TBD
FY 2028	N/A	N/A	TBD
FY 2029	N/A	N/A	TBD
FY 2030	N/A	N/A	TBD
FY 2031	N/A	N/A	TBD
Total, Construction	N/A	N/A	9,179,089
TEC			
FY 1999	28,000	9,600	2,545
FY 2000	12,375	30,775	33,512
FY 2001	25,943	25,943	29,938
FY 2002	65,993	65,993	52,513
FY 2003	92,088	92,088	82,022
FY 2004	360,274	81,081	93,457
FY 2005	365,087	295,295	216,801
FY 2006	217,800	337,322	180,828
FY 2007	262,500	262,500	177,407
FY 2008	231,721	346,184	268,132
FY 2008 (rescinded PY unobligated balance)	-115,000	0	0
FY 2009	467,808	467,808	369,718
FY 2010	504,238	504,238	494,382
FY 2011	501,788	501,788	533,087
FY 2012	435,172	435,172	705,854
FY 2013	400,990	400,990	500,649
FY 2014 Reprogramming	59,242	59,242	0
FY 2014	343,500	343,500	321,566
FY 2015	N/A	N/A	327,476
FY 2016	N/A	N/A	429,164
FY 2017	N/A	N/A	225,988
FY 2018	N/A	N/A	218,269
FY 2019	N/A	N/A	210,761
FY 2020	N/A	N/A	200,858
FY 2021	N/A	N/A	TBD

	(dollars in thousands)		
	Appropriations	Obligations	Costs
FY 2022	N/A	N/A	TBD
FY 2023	N/A	N/A	TBD
FY 2024	N/A	N/A	TBD
FY 2025	N/A	N/A	TBD
FY 2026	N/A	N/A	TBD
FY 2027	N/A	N/A	TBD
FY 2028	N/A	N/A	TBD
FY 2029	N/A	N/A	TBD
FY 2030	N/A	N/A	TBD
FY 2031	N/A	N/A	TBD
Total, TEC	N/A	N/A	10,251,519
Other Project Cost (OPC)			
OPC except D&D			
FY 1999	5,000	5,000	4,500
FY 2000	5,000	5,000	4,500
FY 2001	5,000	5,000	5,000
FY 2002	5,000	5,000	5,000
FY 2003	8,000	8,000	5,000
FY 2004	9,292	9,292	11,500
FY 2005	9,357	9,357	3,749
FY 2006	28,200	21,300	7,023
FY 2007	915	7,792	9,278
FY 2008 [a]	47,068	47,068	15,746
FY 2009 [b]	0	0	21,451
FY 2010	56,466	56,466	19,344
FY 2011	4,000	4,000	50,211
FY 2012	47,035	47,035	33,142
FY 2013	40,000	40,000	35,065
FY 2014	40,000	40,000	34,582
FY 2015	N/A	N/A	22,448
FY 2016	N/A	N/A	28,257
FY 2017	N/A	N/A	27,580
FY 2018	N/A	N/A	27,337
FY 2019	N/A	N/A	27,414
FY 2020	N/A	N/A	27,053
FY 2021 - FY 2031	N/A	N/A	TBD
Total, OPC except D&D	N/A	N/A	2,439,333

[a] MOX funded within the Nuclear Energy appropriation.
[b] MOX funded with the Other Defense Activities appropriation.

	(dollars in thousands)		
	Appropriations	Obligations	Costs
Total Project Cost (TPC)			
FY 1999	33,000	14,600	7,045
FY 2000	17,375	35,775	38,012
FY 2001	30,943	30,943	34,938
FY 2002	70,993	70,993	57,513
FY 2003	100,088	100,088	87,022
FY 2004	369,566	90,373	104,957
FY 2005	374,444	304,652	220,550
FY 2006	246,000	358,622	187,851
FY 2007 [a]	263,415	270,292	186,685
FY 2008 [b c]	278,789	393,252	283,878
FY 2008 (rescinded PY unobligated balance)	-115,000	0	0
FY 2009 [d e]	467,808	467,808	391,169
FY 2010 [f]	560,704	560,704	513,726
FY 2011 [g]	505,788	505,788	583,298
FY 2012	482,207	482,207	738,996
FY 2013	440,990	440,990	535,714
FY 2014 Reprogramming	59,242	59,242	0
FY 2014	383,500	383,500	356,148
FY 2015	345,000	345,000	349,924
FY 2016	345,000	345,000	457,421
FY 2017	221,000	221,000	253,568
FY 2018	221,000	221,000	245,606
FY 2019	221,000	221,000	238,175
FY 2020	221,000	221,000	227,911
FY 2021	TBD	TBD	TBD
FY 2022	TBD	TBD	TBD
FY 2023	TBD	TBD	TBD
FY 2024	TBD	TBD	TBD
FY 2025	TBD	TBD	TBD
FY 2026	TBD	TBD	TBD
FY 2027	TBD	TBD	TBD
FY 2028	TBD	TBD	TBD
FY 2029	TBD	TBD	TBD
FY 2030	TBD	TBD	TBD
FY 2031	TBD	TBD	TBD
Total, TPC [h]	12,690,852	12,690,852	12,690,852

[a] Includes $31M for long-lead procurements.
[b] Includes $37.6M for long-lead procurements.
[c] MOX funded within the Nuclear Energy appropriation.
[d] MOX funded within the Other Defense Activities appropriation.
[e] Includes $177.4M for long-lead procurements.
[f] Includes $167.9M for long-lead procurements.
[g] Includes $67.1M for long-lead procurements.

6. Details of Project Cost Estimate

(dollars in thousands)

	Current Total Estimate[a]	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design (PED)			
Design	1,072,430	TBD	916,148
Contingency	0	0	0
Total, PED	1,072,430	TBD	916,148
Construction			
Site Preparation	39,957	39,957	39,929
Equipment	800,000	TBD	251,791
Other Construction	7,209,398	TBD	2,067,639
Contingency	1,129,734	TBE	663,121
Total, Construction	9,179,089	TBD	3,022,480
Total, TEC	10,251,519	TBD	3,938,628
Contingency, TEC	1,129,734	TBD	663,121
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Planning	37,723	37,723	37,723
Conceptual Design	0	0	0
Start-up	1,811,929	TBD	650,468
Other OPC	119,415	TBD	NA
Contingency	470,266	TBD	187,510
Total, OPC except D&D	2,439,333	TBD	875,701
D&D			
D&D	0	0	0
Contingency	0	0	0
Total, D&D	0	0	0
Total, OPC	2,439,333	TBD	875,701
Contingency, OPC	470,266	TBD	187,510
Total, TPC	12,690,852	TBD	4,814,329
Total, Contingency	1,600,000	TBD	850,631

[a] Schedules, dates, and costs will be updated to reflect the decision on the path forward for plutonium disposition. These estimates reflect the high end range of the USACE estimate.

[b] Schedules, dates, and costs will be updated to reflect the decision on the path forward for plutonium disposition. The current total estimate shown reflects the high end range from the USACE estimate.

7. Schedule of Appropriation Requests

(dollars in thousands)

		Prior Years	FY 2015 [a]	FY 2016 [b]	FY 2017 [b]	FY 2018 [b]	FY 2019 [b]	FY 2020 [b]	Outyears [b]	Total
FY 2009	TEC	3,512,050	125,611	300,967	0	0	0	0	0	3,938,628
	OPC	781,998	85,771	7,932	0	0	0	0	0	875,701
	TPC	4,294,048	211,382	308,899	0	0	0	0	0	4,814,329
FY 2010	TEC	3,812,250	125,773	37,805	0	0	0	0	0	3,975,828
	OPC	783,699	91,603	5,999	0	0	0	0	0	881,301
	TPC	4,595,949	217,376	43,804	0	0	0	0	0	4,857,129
FY 2011 [c d]	TEC	3,812,250	125,773	37,805	0	0	0	0	0	3,975,828
	OPC	783,699	91,603	5,999	0	0	0	0	0	881,301
	TPC	4,595,949	217,376	43,804	0	0	0	0	0	4,857,129
FY 2012	TEC	3,812,250	125,773	37,805	0	0	0	0	0	3,975,828
	OPC	783,699	91,603	5,999	0	0	0	0	0	881,301
	TPC	4,595,949	217,376	43,804	0	0	0	0	0	4,857,129
FY 2013	TEC	3,963,250	9,773	2,805	0	0	0	0	0	3,975,828
	OPC	632,699	207,603	40,999	0	0	0	0	0	881,301
	TPC	4,595,949	217,376	43,804	0	0	0	0	0	4,857,129
FY 2014	TEC	4,213,622	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	310,333	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TPC	4,523,955	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FY 2014 Reprogramming	TEC	3,916,020	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	OPC	270,333	0	0	0	0	0	0	0	270,333
	TPC	4,186,353	0	0	0	0	0	0	0	TBD
FY 2015	TEC	4,259,520	196,000	196,000	196,000	196,000	196,000	196,000	TBD	TBD
	OPC	310,333	25,000	25,000	25,000	25,000	25,000	25,000	TBD	TBD
	TPC	4,569,853	221,000	221,000	221,000	221,000	221,000	221,000	TBD	TBD
FY 2016	TEC	4,259,520	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10,251,519
	OPC	310,333	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,439,333
	TPC	4,569,853	345,000	345,000	221,000	221,000	221,000	221,000	6,891,999	12,690,852

[a] These numbers reflect the slow-down of the current plutonium disposition strategy while assessing alternative strategies.
[b] Schedules, dates, and costs will be updated to reflect the decision on the path forward for plutonium disposition. These totals reflect the high end range estimates from the USACE estimate.
[c] FY 2011 OPC appropriations were only $4 million vs. $30 million planned.
[d] FY 2011 total estimated cost appropriations were increased by $26 million.

8. Related Operations and Maintenance Funding Requirements

Start of Operation of Beneficial Occupancy (fiscal quarter or date)	TBD
Expected Useful Life (number of years) (after hot startup) [e]	TBD
Expected Future Start of D&D of this capital asset (fiscal quarter)	N/A

(Related Funding Requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total	Previous Total	Current Total	Previous Total
Operations	582,015	470,021	8,730,238	7,111,447
Security	88,650	73,190	1,329,763	1,097,844
Total, Operations and Security	670,665	543,211	10,060,001	8,209,291

The MFFF operations escalated life cycle cost was estimated with the following assumptions: (a) the MFFF CD-4 date is September 2027; (b) the MFFF de-inventory/flushing is complete in September 2042; (c) includes all MFFF operating costs, including operations costs prior to CD-4; and (d) the annual operating cost has been determined by averaging the escalated costs over the 15 years of operations (FY 2028-2042 inclusive of hot start-up, steady state operations and de-inventory/flushing). Outyear projections are extrapolated based on the Early Option II (EO2) proposal for the scope to complete the first 8 fuel assemblies. The projections will be updated following contract negotiations. The estimate includes the 1.9% annual escalation as directed in the OMB budget guidance. In addition, the estimate includes approximately $1.3 billion in security costs required to be appropriated outside of the DNN appropriation. The lifecycle cost estimate does not reflect the cost for the transportation of the material which is funded by a separate organization.

9. D&D Information

The new area being constructed in this project is not replacing existing facilities.

Area	Square Feet
Area of new construction	441,000
Area of existing facility(s) being replaced	N/A
Area of additional D&D space to meet the "one-for-one" requirement	N/A

Name(s) and site location(s) of existing facility(s) to be replaced:
The new construction is not replacing an existing facility.

10. Acquisition Approach

The procurement strategy for the MOX facility involved awarding a base contract to Duke Cogema Stone & Webster (now Shaw AREVA MOX Services) in March 1999 for design, licensing, and irradiation services associated with fuel qualification activities and reactor licensing. Three options were included in the base contract for: (1) construction and management oversight; (2) hot start-up, operations, and irradiation services; and (3) deactivation—which can be awarded separately. Option 1 was exercised by DOE in May 2008. In January 2009, an Early Option 2 proposal was submitted to NNSA for consideration. The proposed work scope included the fabrication of eight fuel assemblies as a part of the facility hot start-up plan.

[e] The nominal design life of the facility is 40 years, however, it will take approximately 15 years to complete the 34 MT mission.

CB&I AREVA MOX Services is a Limited Liability Company (LLC) comprised of Chicago Bridge and Iron (CB&I) Company and the French company, AREVA. In February 2013 CB&I completed its acquisition of the previous LLC member, The Shaw Group. Since CB&I is a foreign-based company, a proxy company has been formed to address U.S. government foreign ownership and control regulations. As a result, a proxy company under CB&I named Shaw Project Services Group, LLC, was formed to oversee CB&I's security-sensitive work such as the MFFF Project.

Physical construction is being performed through a combination of fixed-price sub-contracts and MOX Services' direct managed construction craft. A combination of award fees and incentive fees are included in the overall contract with MOX Services to reward performance within established project baselines.

Nuclear Counterterrorism and Incident Response Program

Overview

One of NNSA's enduring missions is to protect our nation and its interests from the threat of nuclear terrorism. We must address the danger that hostile nations or terrorist groups may acquire nuclear devices and weapons-usable material while sustaining the capacity and preparedness to respond to and mitigate any radiological or nuclear incident or accident, whether at a DOE site, elsewhere in the U.S., or abroad. The NNSA Nuclear Counterterrorism and Incident Response (NCTIR) Program, which in FY 2016 incorporates the technical activities formerly under the Counterterrorism and Counterproliferation (CTCP) Programs, deploys expert scientific teams and equipment to provide a technically-trained, rapid response to a nuclear or radiological incident or accident. The program also develops, supports, and executes the DOE's broader emergency management, Emergency Operations Center, and communications capabilities. It formulates and leverages a set of mutually supportive technical activities to assess radiological and nuclear threat devices. The program also supports policy-makers and military planners on a wide range of contingency planning and exercises. As a key interagency partner, the program executes National Technical Nuclear Forensics sample and evidence collection and related analysis.

The FY 2016 Request proposes the combination of the NCTIR and CTCP programs to eliminate confusion about NNSA counterterrorism programs and activities, and change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program. The Request also proposes to combine the Emergency Management and Operations Support programs to show a streamlined approach for improved Emergency Management activities and practices, including the Emergency Operations Center, which will use the Emergency Communications Network to provide technical support to DOE and NNSA sites. NNSA also proposes to name this combination of two programs Emergency Management and Operations Center. Lastly, NNSA proposes to combine the NCTIR International Emergency Management and Cooperation subprogram and the CTCP Counterterrorism Policy and Cooperation activities and name the subprogram Counterterrorism Response and Capacity Building.

The Nuclear Counterterrorism (NCT) subprogram (conducted under CTCP in FY 2015) executes the nation's technical capacity to understand and defeat nuclear threat devices (NTD) including Improvised Nuclear Devices (INDs), and lost or stolen foreign nuclear weapons. Technical work on device assessment also supports the Department of Defense (DoD), FBI and Intelligence Community planning, and operational capabilities. Technology integration activities include a staged process for targeted tool development over the short and long term.

Additionally, NCTIR reduces the risk of nuclear terrorism by conducting technically-informed national and international outreach to strengthen nuclear counterterrorism capabilities through training, equipment, tabletop exercises, bilateral dialogues, and technical exchanges.

Highlights of the FY 2016 Budget Request

The NCTIR FY2016 request includes funding to provide technical equipment and training to address the threat of nuclear terrorism and associated threat devices. NNSA partners with the FBI to roll out radiological/nuclear device stabilization capabilities to selected cities and provide yearly recurring sustainment training and equipment maintenance. The request also provides funding for communications and IT infrastructure improvements for both Departmental emergency management needs as well as those National Assets responding in support of a national or international incident. The request allows for the initiation of directed upgrades to the classified and unclassified communications networks supporting emergency response and makes additional improvements as required to meet national cybersecurity standards. To avoid degradation of these critical communications systems, these upgrades are needed to replace operating systems currently in use on the Emergency Communications Network (ECN) and to ensure redundant classified call management capability. The NCT subprogram will sustain threat device assessment capabilities and unique modeling expertise critical to response capabilities and contingency planning efforts. NCT will also sustain programs to protect IND design information and manage the assessment of weapon-related open source information. NCT will also sustain international technical and policy engagements through the Nuclear Threat Reduction (NTR) Channels with the Republic of France and the United Kingdom.

At the request of the DoD and in support of national policy objectives, NCT will gather existing experimental and other data, identify information and modeling gaps, and continue the development of the national capability to predict the behavior of non-stockpile nuclear materials or components in response to innovative approaches for standoff disablement. This activity includes experimental and computational investigations that improve our confidence in modeling capabilities.

Finally, the NCTIR program will support bilateral counterterrorism security dialogues with advanced civil nuclear partner countries and capability development of nuclear incident response and WMD counterterrorism capabilities, domestically and with key international partners. This capability development focuses on specialized training and exercises, tailored assistance projects, and exchanges of best practices covering each of these response requirements, in order to build and strengthen comprehensive National and international nuclear threat response awareness and capabilities.

Major Outyear Priorities and Assumptions

Outyear funding levels for the NCTIR Program total $963,945,000 for FY 2017 through FY 2020. The outyear numbers for NCTIR reflect major program priorities through the FYNSP period. During this period, the program will:

- Sustain mission, maintain readiness and continue Emergency Communications Network Suite upgrades to maintain state of the art capabilities.
- Adapt to factors such as increasing demand for nuclear/radiological expertise, emergence of new technologies and expanding threats of proliferation and nuclear terrorism.
- Sustain the established stabilization capability.
- Sustain established NTD and IND assessment capabilities.
- Continue Standoff Disablement capability evaluations.
- Continue national and international efforts to provide training, detection equipment and technical support for radiological and nuclear incident response and counterterrorism, including Silent Thunder and Eminent Discovery tabletop exercises.

Nuclear Counterterrorism and Incident Response Program
Funding (Non-Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nuclear Counterterrorism and Incident Response Program [a]					
Emergency Response	0	0	0	139,077	+139,077
National Technical Nuclear Forensics	0	0	0	10,041	+10,041
Emergency Management and Operations Center	0	0	0	20,227	+20,227
Counterterrorism Response and Capacity Building	0	0	0	7,256	+7,256
Nuclear Counterterrorism Assessment	0	0	0	57,789	+57,789
Total, Nuclear Counterterrorism and Incident Response Program [a]	**0**	**0**	**0**	**234,390**	**+234,390**

Nuclear Counterterrorism and Incident Response Program
Funding (Comparable)

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Nuclear Counterterrorism Incident Response Program					
Emergency Response	143,748	142,101	142,577	139,077	-3,500
National Technical Nuclear Forensics	11,000	11,648	10,250	10,041	-209
Emergency Management and Operations Center	14,545	14,545	20,518	20,227	-291
Counterterrorism Response and Capacity Building	7,000	8,277	6,095	7,256	+1,161
Nuclear Counterterrorism Assessment	51,950	51,950	44,593	57,789	+13,196
Total, Nuclear Counterterrorism Incident Response Program	**228,243**	**228,521**	**224,033**	**234,390**	**+10,357**

[a] The Nuclear Counterterrorism and Incident Response program is proposed to be transferred to the Defense Nuclear Nonproliferation appropriation starting in FY 2016.

Outyears for Nuclear Counterterrorism and Incident Response Program
Funding

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Nuclear Counterterrorism and Incident Response Program				
Emergency Response	139,833	144,503	146,356	148,713
National Technical Nuclear Forensics	11,800	10,957	11,900	11,659
Emergency Management and Operations Center	21,093	16,988	17,220	16,108
Counterterrorism Response and Capacity Building	7,777	7,932	9,037	9,590
Nuclear Counterterrorism Assessment	61,251	59,138	55,100	55,990
Total, Nuclear Counterterrorism and Incident Response Program	**241,754**	**239,518**	**239,613**	**243,060**

Nuclear Counterterrorism and Incident Response Program
Proposed Budget Structure Changes

The FY 2016 Request proposes the combination of the NCTIR and CTCP programs to eliminate confusion about NNSA counterterrorism programs and activities, and change the NCTIR name to Nuclear Counterterrorism ***and*** Incident Response Program. The Request also proposes to combine the Emergency Management and Operations Support subprograms to show a streamlined approach for improved Emergency Management activities and practices, including the Emergency Operations Center, which will use the Emergency Communications Network to provide technical support to DOE and NNSA sites. NNSA also proposes to name this combination of two programs Emergency Management and Operations Center. Lastly, NNSA proposes to combine the NCTIR International Emergency Management and Cooperation subprogram and the CTCP Counterterrorism Policy and Cooperation activities and name the subprogram Counterterrorism Response and Capacity Building.

Budget Structure Crosswalk[a]
(Dollars in Thousands)

	Nuclear Counterterrorism and Incident Response					
	Emergency Response	National Nuclear Technical Forensics	Emergency Management and Operations Center	Counterterrorism Response and Capacity Building	Nuclear Counterterrorism Assessment	Total
FY 2015 Budget Structure						
Weapons Activities						
Nuclear Counterterrorism Incident Response						
Emergency Repsonse	139,077					139,077
National Technical Nuclear Forensics		10,041				10,041
Emergency Management			5,635			5,635
Operations Support			14,592			14,592
International Emergency Management and Cooperation				5,756		5,756
Subtotal, Nuclear Counterterrorism Incident Response	**139,077**	**10,041**	**20,227**	**5,756**		**175,101**
Counterterrorism and Counterproliferation Programs				1,500	57,789	59,289
Total	**139,077**	**10,041**	**20,227**	**7,256**	**57,789**	**234,390**

[a] This table shows the crosswalk from the FY 2015 budget structure to the proposed FY 2016 budget structure for Nuclear Counterterrorism and Incident Response. A crosswalk that captures all of Defense Nuclear Nonproliferation is included in the Overview section.

Nuclear Counterterrorism and Incident Response Program
Explanation of Major Changes
(Dollars in Thousands)
(Comparable)

	FY 2016 vs FY 2015
Emergency Response: This decrease reflects sustainment of nine stabilization cities that include equipment maintenance and training and deferred equipment recapitalization.	**-3,500**
National Technical Nuclear Forensics: The decrease reflects the deferral of work scope for the Bulk Special Nuclear Materials program (BSAP) trace element analysis, and research projects for post detonation ground collection.	**-209**
Emergency Management and Operations Center: Reflects proposed merger of Emergency Management and Operations Support. The decrease reflects efficiencies in Emergency Management Implementation and a non-recurring cost in FY 2015 for the purchase of servers.	**-291**
Counterterrorism Response and Capacity Building: Reflects proposed merger of two subprograms International Emergency Management and Cooperation Program as well as the CTCP Counterterrorism Policy and Cooperation activities. The increase will support performance of international training, as well as engaging two additional countries in cooperation and strengthening their emergency management systems.	**+1,161**
Nuclear Counterterrorism Assessment: Increased funding is requested to support standoff disablement activities.	**+13,196**
Total, Nuclear Counterterrorism and Incident Response Program	**+10,357**

Nuclear Counterterrorism and Incident Response Program
Emergency Response

Description

The Emergency Response subprogram serves as the last line of national defense in the face of a nuclear or radiological incident or accident. The mission is to safeguard the public, environment, and emergency responders by providing a responsive, flexible, efficient, and effective nuclear/radiological emergency response capability for any nuclear or radiological incident domestically or abroad by applying the unique technical expertise within NNSA's nuclear security enterprise. The strategic approach for emergency response activities is to ensure a central point of contact and an integrated response to all emergencies. This is accomplished by ensuring the appropriate infrastructure is in place to provide command, control, coordination, and communications. It is also essential that response personnel are properly organized, trained and equipped to successfully resolve an incident.

Nuclear Emergency Support Team (NEST)

This activity provides the Federal Bureau of Investigation (FBI), the DoD, and the Department of Homeland Security (DHS), with technical teams to respond to incidents including terrorist threats involving nuclear materials. The primary missions of the Teams (Accident Response Group (ARG), Radiological Assistance Program (RAP), Nuclear/Radiological Advisory Team (NRAT) and Joint Technical Operations Team (JTOT) are to search for, identify, characterize, render safe and dispose of any nuclear or radiological device.

Other Assets

Additional assets provide assistance to federal, state and local entities. This activity also conducts exercises in response to emergencies involving nuclear/radiological materials. The DOE/NNSA teams work closely with other DOE elements as well as other federal agencies, including DHS, Federal Emergency Management Agency (FEMA), Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC) and DoD. The DOE/NNSA teams also provide support to the NEST programs to ensure safe incident resolution and the protection of public safety and the environment.

Render Safe Stabilization Operations

This activity provides technical assistance and training to the FBI and DoD to prevent nuclear terrorism using technology and regional teams to locate and identify radiological/nuclear devices and to prevent these devices from detonating.

Activities and Explanation of Changes (Comparable)

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Emergency Response $142,577,000 **Nuclear Emergency Support Team**	**Emergency Response $139,077,000** **Nuclear Emergency Support Team**	**Emergency Response -$3,500,000** **Nuclear Emergency Support Team**
• Provide technical assistance to federal, state, tribal, local, and international government agencies to deal with incidents, including terrorist threats that involve potential use of nuclear materials, based on the TCE for each event. • Provide technical assistance to a Lead Federal Agency to search for or detect illicit radiological or nuclear material. • Continue collection and expert analysis of radiological material signatures through DOE Radiological Triage program. • Sustain Render Safe capabilities for an identified critical mission area in support of Principle Operational Partner. This effort includes predictive capability. • Address threats posed by domestic and foreign terrorists likely to have both the will and means to employ nuclear devices and weapons-usable nuclear materials. • Provide DOE/NNSA technical assistance for the planning, execution, and evaluation of National level exercises, including but not limited to: Marble Challenge, Nuclear Weapons Accident Exercises (NUWAIX), and other Department of Defense-led exercises in which DOE/NNSA is not the lead agency.	• Provide technical assistance to federal, state, tribal, local, and international government agencies to deal with incidents, including terrorist threats that involve potential use of nuclear materials, based on the TCE for each event. • Provide technical assistance to a Lead Federal Agency to search for or detect illicit radiological or nuclear material. • Continue collection and expert analysis of radiological material signatures through DOE Radiological Triage program. • Address threats posed by domestic and foreign terrorists likely to have both the will and means to employ nuclear devices and weapons-usable nuclear materials. • Sustain Render Safe capabilities for an identified critical mission area in support of Principle Operational Partner. This effort includes predictive capability. • Provide DOD/NNSA technical assistance for the planning, execution, and evaluation of National-level exercises including, but not limited to, Marble Challenge and nuclear weapons accident incident exercise (NUWAIX). • Provide DOE/NNSA technical assistance for the planning, execution, and evaluation of National level exercises, including but not limited to: Marble Challenge, Nuclear Weapons Accident Exercises (NUWAIX), and other Department of Defense-led exercises in which DOE/NNSA is not	• Reflects deferred equipment recapitalization in support of the deployable assets in order to support increases in other program areas. • Reflects reduced support for Special Activity Event Rating events (examples of these Events are National Conventions, the Super Bowl, the World Series and the Boston Marathon).

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	the lead agency. **FY 2017-FY 2020** • Provide technical assistance to federal, state, tribal, local, and international government agencies to deal with incidents, including terrorist threats that involve potential use of nuclear materials, based on the TCE for each event. • Provide technical assistance to a Lead Federal Agency to search for or detect illicit radiological or nuclear material. • Continue collection and expert analysis of radiological material signatures through the DOE Radiological Triage program. • Sustain Render Safe capabilities for an identified critical mission area in support of Principal Operational Partner. This effort includes predictive capability. • Lead one evolution of interagency NUWAIX 2020 with participation by DoD, FBI and other Federal agencies. • Address threats posed by domestic and foreign terrorists likely to have both the will and means to employ nuclear devices and weapons-usable nuclear materials.	
Other Assets • Maintain training for the Consequence Management response teams and home teams. Sustain data systems for communications between the field teams and home teams. • Facilitate radiological response and recovery efforts in the event of the intentional or accidental release of radiological or nuclear material. • Inform public health officials on evacuation	**Other Assets** • Maintain training for the Consequence Management response teams and home teams. • Sustain data communications systems for communications between the field teams and home teams. • Facilitate radiological response and recovery efforts in the event of the intentional or accidental release of radiological or nuclear material.	**Other Assets** • Reflects a decrease in Other Assets reducing assistance provided to other federal agencies and state and local jurisdictions. • Reflects a decrease in equipment recapitalization.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
guidance and health effects from the accidental or intentional release of radiological materials. • Work jointly with the Federal coordinating agency, which is usually DHS/FEMA, during any radiological accident or incident. • Coordinate with the EPA/NRC and other elements within DOE, and provide support to the NEST programs to safeguard the public and environment to ensure the successful resolution of an accident or incident. • Serve as the co-lead Federal Agency for a National level Exercise.	• Inform public health officials on evacuation guidance and health effects from the accidental or intentional release of radiological materials. • Work jointly with the Federal coordinating agency, which is usually DHS/FEMA, during any radiological accident or incident. • Coordinate with the EPA/NRC and other elements within DOE, and provide support to the NEST programs to safeguard the public and environment to ensure the successful resolution of an accident or incident. **FY 2017-FY 2020** • Maintain training for the Consequence Management response teams and home teams. Sustain data communications systems for communications between the field teams and home teams. • Facilitate radiological response and recovery efforts in the event of the intentional or accidental release of radiological or nuclear material. • Inform public health officials on evacuation guidance and health effects from the accidental or intentional release of radiological materials. • Work jointly with the Federal coordinating agency, which is usually DHS/FEMA, during any radiological accident or incident. • Coordinate with the EPA/NRC and other elements within DOE, and provide support to the NEST programs to safeguard the public and environment to ensure the successful resolution of an accident or incident. • Serve as the lead Federal Agency for National level Exercise.	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Render Safe Stabilization Operations	**Render Safe Stabilization Operations**	**Render Safe Stabilization Operations**
• Sustain capability for seven Stabilization cities including training and equipment maintenance. • Rollout eighth city and begin training for 9th Stabilization city.	• Roll out ninth city. • Sustain capability for nine Stabilization cities including training and equipment maintenance. **FY 2017-FY 2020** • Sustain capability for nine Stabilization cities including training and equipment maintenance.	• The program will continue to sustain nine Stabilization cities by providing training and equipment for this joint effort with the FBI.

Nuclear Counterterrorism and Incident Response Program
National Technical Nuclear Forensics

Description

The National Technical Nuclear Forensics (NTNF) subprogram maintains the operational capability for the Pre-Detonation Device technical nuclear forensics program and provides operational support to the Post-Detonation and Bulk Special Nuclear Materials (SNM) Analysis technical nuclear forensics programs. The NTNF subprogram is a Homeland Security Council (HSC)/National Security Council (NSC) sponsored policy initiative, which aims to establish missions, institutionalize roles and responsibilities and enable operational support for pre-detonation and post-detonation nuclear forensics and attribution programs. This support includes, but is not limited, to training and exercises, equipment purchases and maintenance, logistics, readiness to deploy pre- and post-detonation response teams, technical integration, and readiness to conduct bulk actinide laboratory analysis.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
National Technical Nuclear Forensics $10,250,000	**National Technical Nuclear Forensics $10,041,000**	**National Technical Nuclear Forensics -$209,000**
• Provide capability and support to the interagency NTNF program. • Reduce International Technical Exchanges with the United Kingdom and the Israel Atomic Energy Commission. • Maintain capability and readiness to respond to pre- and post- detonation events. • Execute a full scale ground collections exercise. • Plan and participate in pre- and post- detonation NTNF exercises. • Suspend P-Tunnel forensic characterization. • Maintain P-Tunnel in support of the Pre-Detonation Device Program. • Reduce work scope for an objective operational capability for the BSAP.	• Provide technical and operational capabilities in support of the US Government interagency NTNF program. • Maintain readiness to respond to pre- and post-detonation events. • Participate in one Ground Collection Task Force field exercises. • Conduct two Disposition and Forensics Evidence Analysis Team (DFEAT) exercises including one "end-to-end" exercise including Device Assessment. • Continue preventative and corrective facility maintenance at P-Tunnel, NNSS for support to the Pre-Detonation Device Program. • Build and maintain an objective operational capability for the Bulk Special Nuclear Materials program (BSAP). • Decrease number and scope of technical integration projects for ground collections. • Lead US support to the US/UK JOWOG 29 Nuclear Forensics User Group. **FY 2017-FY 2020** • Provide technical and operational capabilities in support of the USG interagency NTNF program. • Maintain readiness to respond to pre- and post-detonation nuclear events. • Participate in two Ground Collection Task Force field exercises per year. • Continue support for Post-detonation Device Reconstruction training and exercises.	• Decrease work scope for BSAP trace element analysis, operational research projects for post-detonation ground collection and Nuclear Forensic User Group technical exchange projects under the auspices of JOWOG-29. • Decrease participation from two to one Ground Collection Task Force exercise. • Decrease the number and scope of technical integration projects for ground collections. • Decreases in this subprogram will allow for increases in other areas of the program.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	• Conduct two Disposition and Forensics Evidence Analysis Team (DFEAT) exercises per year. • Continue preventative and corrective facility maintenance at P-Tunnel, NNSS for the Pre-Detonation Device Program. • Continue to build and maintain an objective operational capability for the Bulk Special Nuclear Materials program (BSAP) • Reduce scope for trace element analysis, radiochronometry, surface analysis/morphology. • Maintain a portfolio of technical integration projects for ground collections. • Lead US support to the US/UK JOWOG 29 Nuclear Forensics User Group.	

Nuclear Counterterrorism and Incident Response Program
Emergency Management and Operations Center

Description

The Emergency Management and Operations Center subprogram works to bolster emergency preparedness and response for DOE to sustain the DOE/NNSA mission, maintain readiness, and continue to have a fully implemented and fully integrated Departmental comprehensive emergency management system throughout the nuclear security enterprise. The FY16 Request proposes to merge the Emergency Management Subprogram and the Operations Support Subprogram into one subprogram. The requested merger of these subprograms will show the connection between the Emergency Management and Operations Support activities.

The Emergency Management subprogram serves as the single point of contact for implementing and coordinating emergency management policy, preparedness, and response activities within DOE/NNSA, including supporting and coordinating NNSA field and contractor implementation of emergency management policy.

To build emergency preparedness across DOE/NNSA, the subprogram develops and implements specific programs, plans, and systems to minimize the impacts of emergencies on worker and public health and safety, the environment, and national security. This is accomplished by promulgating appropriate Departmental policies and implementing requirements and guidance; developing and conducting training and other emergency preparedness activities; supporting DOE/NNSA readiness assurance activities and participating in interagency emergency planning and coordination activities.

This subprogram operates the DOE Emergency Operations Centers and the Emergency Communications Network (ECN). The DOE Headquarters Emergency Operations Center provides the core functions of supporting Departmental command, control, communications, Geographic Information System (GIS) data and situational intelligence requirements for all categories of DOE emergency response situations on a 24/7/365 day basis.

The ECN is the Department's communications means to collect, process, and disseminate emergency related information from multiple internal and external sources. The ECN helps DOE/NNSA decision-makers to maintain a common operating picture during the management and support of operational emergencies, energy emergencies, and emergency assistance, including national and international counterterrorism events and COOP related events. The network supports **classified** and **unclassified** voice, video, and data transmissions. The system is expected to grow to over 110 nodes by end of FY 2020, a 266% increase over 2006, and a 23.24% increase over FY 2015. The ECN provides support for the Legacy and COOP missions and the Response/Render Safe, Forensics, and Counterterrorism missions. The expansion has included the installation of nodes into Other Government Agencies and other countries.

The Emergency Operations Training Academy (EOTA) is an academically recognized training and development center that remains on the cutting edge of technology and innovation. It is the Office of Emergency Operations point of service for training development to enhance the readiness of personnel in the emergency operations community.

The Continuity Program (CP) continues to include responsibility for all of DOE and NNSA and is a HSC/NSC required policy initiative. These programs develop the Headquarters and the field Continuity of Operations and Continuity of Government plans that are updated constantly.

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Emergency Management and Operations Center $20,518,000	**Emergency Management and Operations Center $20,227,000**	**Emergency Management and Operations Center -$291,000**
• Conduct activities to promote consistency of emergency management practices at DOE/NNSA sites and in implementing emergency planning for severe events. • Continue to implement emergency management policy for DOE/NNSA sites. • Continue to update and implement departmental policy and procedures. • Continue to serve as the primary point of training for first responder and render safe activities. • Continue with the delivery of intermediate and advanced-level Incident Command System training courses, in addition to business system improvement. • Continue maintenance and operation of the ECN in order to meet the National Security mission requirements and to support the NNSA Network vision. • Continue supporting National Response, COOP/Legacy, Forensics and Counterterrorism elements. • Address critical deficiencies and correct to achieve full system accreditation. • Complete Corrective Action Plans.	• Conduct activities to promote consistency of emergency management practices at DOE/NNSA sites and in implementing emergency planning for severe events. • Continue to implement emergency management policy for DOE/NNSA sites. • Continue to update and implement departmental policy and procedures. • Emergency Operations Training Academy (EOTA) will continue to serve as the primary point of training for first responder and render safe activities. • Continue with the delivery of intermediate and advanced-level Incident Command System training courses, in addition to business system improvement. • Provide technical assistance to DOE/NNSA Complex to complete actions outlined in DNFSB Recommendation 2014-01. • Continue maintenance and operation of the ECN in order to meet the National Security mission requirements and to support the NNSA Network vision. • Continue the replacement or upgrade of servers; desk top computers and lap top systems; printers; switching units; routers; video teleconferencing units; special purpose servers; a new satellite communications system downlink capability; expanded satellite coverage; additional dedicated satellite	• Reflects proposed merger of the Emergency Management Program and the Operations Support Program and renaming to Emergency Management and Operations Center. • Funding decrease results from efficiencies in Emergency Management Implementation and a non-recurring cost in FY 2015 for the purchase of servers.

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	communications bandwidth; and Internet Protocol Call Manager redundancy for HQ on both the classified and unclassified ECN. • Continue supporting National Response, COOP/Legacy, Forensics and Counterterrorism elements. • Continue to provide critical infrastructure and secure cyber-environment • Provide continued support for ECN equipment deficiency upgrades and maintenance that begins in FY 2015. • Execute directed upgrades to the continuous monitoring capabilities of the classified and unclassified networks • Continue to make improvements as required to meet national cyber security standards • Address critical deficiencies and correct to achieve full system accreditation. • Complete Corrective Action Plans. **FY 2017-FY 2020** • Conduct activities to promote consistency of emergency management practices at DoD/NNSA sites and in implementing emergency planning for severe events. • Continue to implement emergency management policy for DOE/NNSA sites. • Continue to update and implement departmental policy and procedures. • EOTA will continue to serve as the primary point of training for first responder and render safe activities. • Continue with the delivery of intermediate and advanced-level Incident Command System training courses, in addition to business system	

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	improvement. • Provide critical infrastructure and ensure a secure cyber-environment • Continue to plan for directed upgrades to the continuous monitoring capabilities of the classified and unclassified networks • Continue improvements as required to meet national cybersecurity standards. Continue maintenance and operation of the ECN in order to meet the National Security mission requirements and to support the NNSA Network vision. • Address critical deficiencies and corrections to achieve full system accreditation.	

Nuclear Counterterrorism and Incident Response Program
Counterterrorism Response and Capacity Building

Description

The Counterterrorism Response and Capacity Building subprogram is comprised of two activities: International Emergency Management and Cooperation and Counterterrorism Policy and Cooperation. These activities develop and strengthen nuclear incident response and WMD counterterrorism capabilities, domestically and with key international partners. These activities develop and conduct specialized training and exercises, technical assistance projects, and exchanges of best practices in order to build and strengthen comprehensive national and international nuclear threat response awareness and capabilities to address any nuclear or radiological event thereby reducing the nuclear terrorism threat to the United States, our partners, and interests.

International Emergency Management and Cooperation (IEMC): This activity provides technical support, training, equipment, exercises and other development activities with partner nations to improve nuclear incident response capabilities, including: radiological search training and techniques, protocol development, and provision of detection equipment and expertise to address lost radiological or nuclear materials; communications systems, radiation detection and monitoring equipment, and associated training and techniques for detection of and response to radiological and nuclear accidents and incidents; sharing of nuclear preparedness and response best practices; protocols , equipment, and training for the effective early warning and notification of nuclear/radiological incidents or accidents; and support to foreign radiological/nuclear incidents and accidents, as needed.

Current ongoing cooperation involves more than 80 countries and 10 international organizations. The program will continue to liaise with and participate in directly relevant projects sponsored by international organizations, such as the International Atomic Energy Agency (IAEA), European Union (EU) and North Atlantic Treaty Organization (NATO).

Counterterrorism Policy and Cooperation Program: This activity designs, develops, and conducts (in collaboration with other U.S. Government partners): domestic *Silent Thunder* site-specific table-top exercises for Federal, State and local agencies with security and response functions at locations with radiological or nuclear materials; *Eminent Discovery* and other international tabletop exercises for officials with border security, counterterrorism, and nuclear security responsibilities to strengthen regional and foreign nation capabilities to identify and respond to nuclear or radiological terror threats,; and *Counterterrorism Security Dialogues* for regular, interagency bilateral exchanges with advanced civil nuclear states, focused on the shared threat of nuclear terrorism and exchanging policy and practical approaches to counter non-state actor threats to civil nuclear materials and facilities.

Activities and Explanation of Changes

FY 2015 Enacted (Funded in Weapons Activities)	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Counterterrorism Response and Capacity Building $6,095,000	**Counterterrorism Response and Capacity Building $7,256,000**	**Counterterrorism Response and Capacity Building +$1,161,000**
• Reduce program support to develop, design, organize and conduct specialized emergency management training courses and programs to meet the specific emergency management needs of partner nations. • Continue to provide enhanced communication and radiation monitoring equipment, technical assistance and training IAEA and foreign government emergency programs to address nuclear/radiological incidents and accidents including lost radiological sources. • Continue to develop a robust and harmonized international management system implementing specialized emergency response activities, including developing emergency policy, plans and procedures and radiological search, training, protocols and techniques.	• Engage in cooperation with two additional countries in building and strengthening their emergency management system. • Provide program support to develop, design, organize and conduct specialized emergency management training courses and programs to meet the specific emergency management needs of partner nations. • Continue to provide enhanced communication and radiation monitoring equipment, technical assistance and training IAEA and foreign government emergency programs to address nuclear/radiological incidents and accidents including lost radiological sources. • Continue to develop a robust and harmonized international management system implementing specialized emergency response activities, including developing emergency policy, plans and procedures and radiological search, training, protocols and techniques. **FY 2017-FY 2020** • Continue to develop, design, organize and conduct specialized emergency management training courses and programs to meet the specific emergency management needs of partner nations. • Continue to provide enhanced communication and radiation monitoring equipment, technical assistance and training for IAEA and foreign	• Reflects merging of two activities: (1) International Emergency Management and Cooperation (+$5,756,000) and (2) Counterterrorism Policy and Cooperation (+$1,500,000) • Reflects an increase of $1,161,000 for IEMC for enhancing specific partner nation capabilities to effectively respond to nuclear/radiological incidents and accidents. The funds will provide for operational support to include specialized emergency management training, communications and radiation monitoring and detection equipment, exercises, major public event (MPE) assistance and radiological source recovery.

FY 2015 Enacted (Funded in Weapons Activities)	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	government emergency programs to address nuclear/radiological incidents and accidents including lost radiological sources. • Develop a robust and harmonized international management system implementing specialized emergency response activities, including developing emergency policy, plans and procedures and radiological search, training, protocols and techniques.	

Nuclear Counterterrorism and Incident Response Program
Nuclear Counterterrorism (NCT) Assessment Program

Description

The NCT Program serves as the primary U.S. Government source of technical expertise on Improvised Nuclear Devices (INDs) and other terrorist nuclear threats. The Program assesses potential pathways for terrorist groups to design and construct INDs, including the unauthorized use of foreign weapons or components, and supports a broad range of operational render-safe activities, planning for counterterrorism and counterproliferation scenarios by the military and domestic agencies, and national policy initiatives to reduce risk. The NCT Program has developed specialized capabilities within the NNSA nuclear weapons design laboratories and production facilities to provide the necessary analysis, policy support, and contingency planning needed by the USG to counter the threat of a stolen, modified, or improvised nuclear weapon or potentially weaponized nuclear material. Additionally, NCT manages a program to protect exceptionally sensitive IND design information and assesses open source technical information that is potentially helpful to terrorists in order to shape our understanding of potential threats and better inform operations and policy.

The majority of this budget request will support high-precision threat device modeling and experiments, as well as validation of technologies to model disablement actions for field deployment. In FY 2016, NCT will continue a series of major experiments in support of the Joint Disablement Campaign, an effort coordinated with DoD to develop, model, and validate render safe/render unusable tools, techniques, and procedures to be applied by military and civilian teams against INDs.

In support of national policy objectives and in partnership with DoD, NCT will explore innovative approaches for standoff disablement. NCT will gather existing experimental and other data, identify information and modeling gaps, and improve the ability to predict the behavior of nuclear components, focusing on those not historically incorporated in U.S. stockpile weapons.

NCT also supports bilateral Nuclear Threat Reduction Channel collaborations between the U.S. and the United Kingdom and the U.S. and France to ensure a secure and effective exchange of best practices and classified technical information supporting technical responses to nuclear incidents. These activities are coordinated within the US interagency to ensure maximum alignment with agreed-upon joint goals and ongoing programs.

Activities and Explanation of Changes

FY 2015 Enacted (Funded in Weapons Activities under CTCP) [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
Counterterrorism and Counterproliferation Programs $44,593,000	**Nuclear Counterterrorism Assessment $57,789,000**	**Nuclear Counterterrorism Assessment +13,196,000**
• Sustain threat device modeling and experiments, as well as development and testing of render safe tools. • Continue standoff disablement exploration and computational activities. • Support international collaboration activities through the Nuclear Threat Reduction (NTR) channels to conduct evaluations of nuclear terrorism risks and scenarios, as well as materials attractiveness studies under the US/Japan Nuclear Security Working Group. • Maintain post-detonation device modeling capabilities. • Continue to manage the monitoring, assessment, and response of open source Nuclear Threat Device (NTD) information.	• Increased activities for threat device modeling and experiments, as well as development and testing of render safe tools. • Selected experiments are also planned, meeting key DoD operational needs. • Restart execution of the Tier Threat Modeling Archive-Validation (TTMA-V) project after minor delays in FY2014 and suspension of activities in FY 2015. • Execute a full range of standoff disablement experiments and modeling activities. This project includes a wide array of new experimental and complex modelling efforts designed to advise USG policies through scientific and technical insights on a range of contingency options. • Support international collaboration activities through the NTR channels to conduct evaluations of nuclear terrorism risks and scenarios, as well as materials attractiveness studies, including those under the US/Japan Nuclear Security Working Group. • Maintain post-detonation device modeling capabilities. • Continue to manage the monitoring, assessment, and response of open source NTD information. **FY 2017-FY 2020** • Continue planned activities for threat device	• The FY 2016 request reflects realignment from CTCP to Nuclear Counterterrorism and Incident Response Program. • Reflects increase to support standoff disablement activities**.**

[a] This activity was funded in Counterterrorism and Counterproliferation Programs within the Weapons Activities appropriation in FY 2015.

FY 2015 Enacted (Funded in Weapons Activities under CTCP) [a]	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015
	modeling and experiments, as well as development and testing of render safe tools. • Continue execution of the TTMA-V project. • Continue to execute innovative standoff disablement exploration activities, with accelerated experimentation continuing through FY2018.	

Nuclear Counterterrorism and Incident Response Program Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Emergency Operations Readiness Index - Emergency Operations Readiness Index (EORI) measures the overall organizational readiness to respond to and mitigate radiological or nuclear incidents worldwide. (This index is measured from 1 to 100 with higher numbers meaning better readiness--the first three quarters will be expressed as the readiness at those given points in time whereas the year end will be expressed as the average readiness for the year's four quarters).							
Target	91 EORI	91 EORI	91 EORI	91 EORI	91 EORI	91 EORI	91 EORI
Result	91						
Endpoint Target	Annually, maintain an Emergency Operations Readiness Index of 91 or higher. Note: This measure was tracked under the Weapons Activities appropriation prior to in FY 2016.						
WMD Counterterrorism Expertise - Cumulative number of officials trained in Weapons of Mass Destruction (WMD) Counterterrorism (CT) prevention and response via Office of Counterterrorism Policy and Cooperation exercises.							
Target	10,200 trained personnel	11,000 trained personnel	11,700 trained personnel	12,500 trained personnel	13,300 trained personnel	14,000 trained personnel	14,800 trained personnel
Result	10,200						
Endpoint Target	By the end of FY 2020, train 14,800 officials in Weapons of Mass Destruction (WMD) Counterterrorism (CT) prevention and response. The Office of Counterterrorism Policy and Cooperation's Weapons of Mass Destruction (WMD) Counterterrorism Exercise Program designs, produces, and conducts tailor-made tabletop exercises for domestic public and private sector customers with nuclear or radioactive materials or associated nuclear security responsibilities. Internationally, the program works with key foreign partners to design, develop, and conduct National and regional WMD security and WMD counterterrorism tabletop exercises. Designed to build teamwork and an in-depth understanding of the roles and responsibilities of agencies charged with responding to terrorist-radiological, nuclear, or WMD-related incidents, these exercises bring together Federal/National, State, and local decision-makers and first responders. This metric provides a quantitative (cumulative number of officials trained) measure of this program's impact. Note: This measure was tracked under the Weapons Activities appropriation prior to in FY 2016. Note: The program erroneously reported the FY 2014 target as the FY 2013 target in the FY 2014 Congressional Justification. The correct target for FY 2014 is shown in this table.							

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Tier Threat Modeling Archive - Validation (TTMA-V) - Percent complete toward validating national 3-D predictive modeling capability using four different experimental series designed to produce data needed to reconstruct nuclear threat device emergency disablement scenarios.							
Target	N/A	35% Complete	50% Complete	70% Complete	85% Complete	100% Complete	N/A
Result	N/A						
Endpoint Target	By the end of FY 2019, complete the validation of the national 3-D predictive modeling capability using four different experimental series designed to produce data needed to reconstruct nuclear threat device emergency disablement scenarios. TTMA-V is a cornerstone joint project for the Joint Disablement Campaign that will build confidence in the models used to develop key products throughout the interagency to include assessments, tool development support, and procedure development. Follow-on projects are identified but must wait for the refinements this project will produce. This effort is coordinated with the Defense Threat Reduction Agency. Note: This measure was tracked under the Weapons Activities appropriation prior to in FY 2016. Note: Due to budget constraints in FY 2014 and FY 2015, TTMA-V was not executed; the experimental validation test series was delayed two years. The program plans to submit a change request for the FY 2015 through FY 2020 targets to reflect the funding reduction.						

Nuclear Counterterrorism and Incident Response Program
Capital Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)							
Capital Equipment >$500K (including MIE)	2,843	2,843	0	0	0	0	0
Plant Projects (GPP) (<$10M)	1,836	855	320	320	327	334	+7
Total, Capital Operating Expenses	**4,679**	**3,698**	**320**	**320**	**327**	**334**	**+7**
Capital Equipment > $500K (including MIE)							
Total Non-MIE Capital Equipment (>$500K)	2,843	2,843	0	0	0	0	0
Total, Capital Equipment (including MIE)	**2,843**	**2,843**	**0**	**0**	**0**	**0**	**0**
Plant Projects (GPP and IGPP) (Total Estimated Cost (TEC) <$10M)							
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	**1,836**	**855**	**320**	**320**	**327**	**334**	**+7**
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**1,836**	**855**	**320**	**320**	**327**	**334**	**+7**
Total, Capital Summary	**4,679**	**3,698**	**320**	**320**	**327**	**334**	**+7**

Outyears for Nuclear Counterterrorism and Incident Response Program

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including (Major Items of Equipment (MIE)				
Capital Equipment >$500K (including MIE)	0	0	0	0
Plant Projects (GPP) (<$10M)	341	349	357	+365
Total, Capital Operating Expenses	**341**	**349**	**357**	**+365**
Capital Equipment > $500K (including MIE)				
Total Non-MIE Capital Equipment (>$500K)	0	0	0	0
Total, Capital Equipment (including MIE)	**0**	**0**	**0**	**0**
Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	341	349	357	+365
Total, Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**341**	**349**	**357**	**+365**
Total, Capital Summary	**341**	**349**	**357**	**+365**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Argonne National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	79,499	25,077	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	1,175	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	2,455	2,566
Nonproliferation and International Security			
Nonproliferation and International Security	7,886	7,800	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	347	161	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	2,290
Global Material Security			
Global Material Security	0	0	5,000
Material Management and Minimization			
Material Management and Minimization	0	0	27,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	7,858
Total, Argonne National Laboratory	**88,907**	**35,493**	**44,714**
Brookhaven National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	1,061	849	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	2,290	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	900	941
Nonproliferation and International Security			
Nonproliferation and International Security	5,406	5,900	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	4,752	2,811	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	1,635
Global Material Security			
Global Material Security	0	0	4,500
Material Management and Minimization			
Material Management and Minimization	0	0	1,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	6,011
Total, Brookhaven National Laboratory	**13,509**	**10,460**	**14,087**

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Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Consolidated Business Center			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	150	100	0
Material Management and Minimization			
Material Management and Minimization	0	0	55,080
Total, Consolidated Business Center	**150**	**100**	**55,080**
Idaho National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	77,003	66,820	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	7,932	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	7,465	7,818
Nonproliferation and International Security			
Nonproliferation and International Security	5,176	3,600	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	574	1,378	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	4,582
Global Material Security			
Global Material Security	0	0	10,000
Material Management and Minimization			
Material Management and Minimization	0	0	77,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	2,322
Total, Idaho National Laboratory	**90,685**	**79,263**	**101,722**
Kansas City Plant			
Nonproliferation and International Security			
Nonproliferation and International Security	1,975	2,400	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	18,972
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	2,445
Total, Kansas City Plant	**1,975**	**2,400**	**21,417**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Lawrence Berkeley National Laboratory			
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	5,936	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	9,377	9,811
Nonproliferation and International Security			
Nonproliferation and International Security	455	0	0
Total, Lawrence Berkeley National Laboratory	**6,391**	**9,377**	**9,811**
Lawrence Livermore National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	6,776	2,125	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	37,537	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	36,125	38,139
Nonproliferation and International Security			
Nonproliferation and International Security	18,675	21,590	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	13,435	10,079	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	40,054
Global Material Security			
Global Material Security	0	0	12,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	19,064
Total, Lawrence Livermore National Laboratory	**76,423**	**69,919**	**109,257**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Los Alamos National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	31,804	22,651	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	108,549	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	90,464	97,848
Nonproliferation and International Security			
Nonproliferation and International Security	23,236	22,900	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	21,533	17,329	0
Fissile Materials Disposition			
Fissile Materials Disposition	38,600	25,000	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	41,500
Global Material Security			
Global Material Security	0	0	30,000
Material Management and Minimization			
Material Management and Minimization	0	0	27,987
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	21,152
Total, Los Alamos National Laboratory	**223,722**	**178,344**	**218,487**
Nevada National Security Site			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	4,254	3,875	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	76,453	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	17,718	18,620
Nonproliferation and International Security			
Nonproliferation and International Security	48	0	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	450	0	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	46,048
Total, Nevada National Security Site	**81,205**	**21,593**	**64,668**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
New Brunswick Laboratory			
Nonproliferation and International Security			
Nonproliferation and International Security	549	675	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	30	50	0
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	688
Total, New Brunswick Laboratory	**579**	**725**	**688**
NNSA Albuquerque Complex			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	31,959	35,279	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	37,180	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	52,822	55,271
Nonproliferation and International Security			
Nonproliferation and International Security	3,310	3,500	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	159,079	39,891	0
Fissile Materials Disposition			
Fissile Materials Disposition	1,305	5,900	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	3,667
Global Material Security			
Global Material Security	0	0	100,721
Material Management and Minimization			
Material Management and Minimization	0	0	11,500
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	2,606
Total, NNSA Albuquerque Complex	**232,833**	**137,392**	**173,765**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
NNSA Production Office (NPO)			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	0	17,707	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	3,700	4,076
Nonproliferation and International Security			
Nonproliferation and International Security	0	825	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	0	1,204	0
Fissile Materials Disposition			
Fissile Materials Disposition	0	29,015	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	3,687
Global Material Security			
Global Material Security	0	0	30
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	841
Total, NNSA Production Office (NPO)	**0**	**52,451**	**8,634**
Oak Ridge Institute for Science & Education			
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	13,340
Global Material Security			
Global Material Security	0	0	45,000
Total, Oak Ridge Institute for Science & Education	**0**	**0**	**58,340**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Oak Ridge National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	28,165	16,442	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	23,493	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	23,650	24,740
Nonproliferation and International Security			
Nonproliferation and International Security	19,983	21,750	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	22,122	23,731	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	2,915
Global Material Security			
Global Material Security	0	0	160,000
Material Management and Minimization			
Material Management and Minimization	0	0	7,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	21,006
Total, Oak Ridge National Laboratory	**93,763**	**85,573**	**215,661**
Oak Ridge National Laboratory Site Office			
Fissile Materials Disposition			
Fissile Materials Disposition	833	685	0
Total, Oak Ridge National Laboratory Site Office	**833**	**685**	**0**
Office of Scientific & Technical Information			
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	16	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	18	19
Total, Office of Scientific & Technical Information	**16**	**18**	**19**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Pacific Northwest National Laboratory			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	83,910	63,983	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	27,773	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	23,430	24,775
Nonproliferation and International Security			
Nonproliferation and International Security	20,618	20,300	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	166,662	113,412	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	2,955
Global Material Security			
Global Material Security	0	0	30,000
Material Management and Minimization			
Material Management and Minimization	0	0	14,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	17,576
Total, Pacific Northwest National Laboratory	**298,963**	**221,125**	**89,306**
Pantex Plant			
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	535	0	0
Nonproliferation and International Security			
Nonproliferation and International Security	58	0	0
Total, Pantex Plant	**593**	**0**	**0**
Princeton Plasma Physics Laboratory			
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	200	0
Total, Princeton Plasma Physics Laboratory	**0**	**200**	**0**
Richland Operations Office			
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	1,550
Total, Richland Operations Office	**0**	**0**	**1,550**

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Funding By Appropriation By Site
($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Sandia National Laboratories			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	44,440	30,104	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	90,884	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	84,672	92,065
Nonproliferation and International Security			
Nonproliferation and International Security	10,095	10,700	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	17,522	10,505	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	35,458
Global Material Security			
Global Material Security	0	0	20,500
Material Management and Minimization			
Material Management and Minimization	0	0	1,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	6,316
Total, Sandia National Laboratories	**162,941**	**135,981**	**155,339**
Savannah River National Laboratory			
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	7,405	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	7,436	7,788
Total, Savannah River National Laboratory	**7,405**	**7,436**	**7,788**
Savannah River Operations Office			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	450	879	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	260	336	0
Fissile Materials Disposition			
Fissile Materials Disposition	439,241	335,000	0
Global Material Security			
Global Material Security	0	0	5,000
Material Management and Minimization			
Material Management and Minimization	0	0	9,000
Nonproliferation Construction			
Nonproliferation Construction	0	0	335,000
Total, Savannah River Operations Office	**439,951**	**336,215**	**349,000**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Savannah River Site			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	24,258	13,091	0
Nonproliferation and International Security			
Nonproliferation and International Security	5,384	5,500	0
Fissile Materials Disposition			
Fissile Materials Disposition	0	2,400	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	3,154
Material Management and Minimization			
Material Management and Minimization	0	0	81,017
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	5,603
Nonproliferation Construction			
Nonproliferation Construction	0	0	10,000
Total, Savannah River Site	**29,642**	**20,991**	**99,774**
Savannah River Site Office			
Fissile Materials Disposition			
Fissile Materials Disposition	56,618	30,000	0
Total, Savannah River Site Office	**56,618**	**30,000**	**0**

Department Of Energy

FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Washington Headquarters			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	6,360	26,770	0
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	31,725	0	0
Defense Nuclear Nonproliferation R&D			
Defense Nuclear Nonproliferation R&D	0	32,969	34,856
Nonproliferation and International Security			
Nonproliferation and International Security	11,929	13,919	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	4,829	50,024	0
Fissile Materials Disposition			
Fissile Materials Disposition	17,253	2,000	0
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	12,522
Legacy Contractor Pensions			
Legacy Contractor Pensions	116,556	102,909	94,617
Global Material Security			
Global Material Security	0	0	4,000
Nonproliferation and Arms Control			
Nonproliferation and Arms Control	0	0	13,215
Total, Washington Headquarters	**188,652**	**228,591**	**159,210**
Waste Isolation Pilot Plant			
Nuclear Counterterrorism and Incident Response			
Nuclear Counterterrorism Incident Response	0	0	61
Total, Waste Isolation Pilot Plant	**0**	**0**	**61**
Y-12 National Security Complex			
Global Threat Reduction Initiative			
Global Threat Reduction Initiative	24,509	0	0
Nonproliferation and International Security			
Nonproliferation and International Security	698	0	0
International Material Protection and Cooperation			
International Material Protection and Cooperation	3,496	0	0
Fissile Materials Disposition			
Fissile Materials Disposition	31,390	0	0
Total, Y-12 National Security Complex	**60,093**	**0**	**0**

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FY 2016 Congressional Budget

Funding By Appropriation By Site

($K)

Defense Nuclear Nonproliferation	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Y-12 Site Office			
Nonproliferation and Verification R&D			
Nonproliferation and Verification R&D	2,242	0	0
Fissile Materials Disposition			
Fissile Materials Disposition	60	0	0
Total, Y-12 Site Office	**2,302**	**0**	**0**
Total, Defense Nuclear Nonproliferation	**2,158,151**	**1,664,332**	**1,958,378**

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, [$1,238,500,000] *$1,375,496,000*, to remain available until expended: Provided, that [$41,500,000] *$45,000,000* shall be available until September 30, [2016] *2017* for program direction [: Provided further, That $4,500,000 from unobligated balances available from prior year appropriations provided under this heading is hereby rescinded: Provided further, That no amounts may be rescinded from amounts that were designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or the Balanced Budget and Emergency Deficit Control Act of 1985].

Explanation of Changes

Change from the language proposed in FY 2015 consists of a change to the requested funding amount and time availability of program direction funding.

Public Law Authorizations

- P.L. 83-703, Atomic Energy Act of 1954"
- "Executive Order 12344 (42 U.S.C. 7158), "Naval Nuclear Propulsion Program"
- P.L. 106-65, National Nuclear Security Administration Act, as amended
- P.L. 113-291, National Defense Authorization Act for Fiscal Year 2015

Naval Reactors

	(Dollars in Thousands)			
	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Naval Reactors	1,095,000	1,101,500	1,238,500	1,375,496
Rescission of Prior Year Balances	0	0	-4,660	0
Total Naval Reactors, Net of Rescissions	**1,095,000**	**1,101,500**	**1,233,840**	**1,375,496**

Overview

The Naval Reactors (NR) appropriation includes funding for activities that respond directly to the National Security Strategy of the United States, and are central to the Department of Energy's pursuit of its Strategic Plan goal of Nuclear Security, playing a critical role in meeting DOE's Strategic Objective 7 to provide safe and effective integrated nuclear propulsion systems for the U.S. Navy. Specifically, NR is responsible for all U.S. Navy nuclear propulsion work, beginning with reactor plant technology development and design, continuing through reactor plant operation and maintenance, and ending with reactor plant disposal. The program ensures the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers (constituting over 45 percent of the Navy's major combatants) and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements.

Naval Reactors' mission includes ensuring the safety of reactors and associated naval nuclear propulsion plants, and control of radiation and radioactivity associated with naval nuclear propulsion activities, including prescribing and enforcing standards and regulations for these areas, as they affect the environment and the safety and health of workers, operators, and the general public. Naval Reactors maintains oversight in areas such as security, nuclear safeguards and transportation, radiological controls, public information, procurement, logistics, and fiscal management.

As part of the National Nuclear Security Administration (NNSA), Naval Reactors 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.

Highlights and Major Changes in the FY 2016 Budget Request

Naval Reactors' request of $1,375,496,000 in fiscal year 2016 is for continued achievement of its core objective of ensuring the safe and reliable operation of the Nation's nuclear fleet.

The Consolidated and Further Continuing Appropriations Act, 2015 provided major construction project funding for the Spent Fuel Handling Recapitalization Project (SFHP) and stipulated that the appropriated Major Construction Project funding include Other Project Costs. This guidance has been applied to the FY 2016 SFHP request. Additionally, prior to CD-2 approval for the SFHP, an independent cost estimate will be performed by the Department of Defense Office of Cost Assessment and Program Evaluation or another capable independent organization external to DOE.

Major Outyear Priorities and Assumptions

The outyear funding (FY 2017 through FY 2020) for Naval Reactors is $6,459,575,000. Outyear funding supports Naval Reactors' core mission of providing proper maintenance and safety oversight, and addressing emergent operational issues and technology obsolescence for all 97 operating reactor plants. This includes 73 submarines, 10 aircraft carriers, and 4 research, development, and training platforms (including the land-based prototypes). Outyear funding also supports Naval Reactors' continued achievement of ongoing new plant design projects, as well as continued achievement of its legacy responsibilities, such as ensuring proper management of naval spent nuclear fuel, prudent recapitalization of aging facilities, and cleanup of environmental liabilities.

Department of Energy (DOE) Working Capital Fund (WCF) Support

The Naval Reactors appropriation projected contribution to the DOE WCF for FY 2016 is $3,614,000. This funding covers certain shared enterprise activities including managing enterprise-wide systems and data, telecommunications and supporting the integrated acquisition environment.

Contractor Pensions
In FY 2016, for the Bettis and Knolls Laboratories, Naval Reactors' planned DOE-funded qualified contractor pension contribution is $80,465,000 and non-qualified contractor pension contribution is $885,293.

Rickover Fellowship Program
NR manages the fellowship to attract and develop technical leaders in the areas of reactor technology and design as it pertains to naval nuclear propulsion. NR anticipates spending $1,032,196 in FY 2016 to support this program.

Naval Reactors
Funding by Congressional Control[a]

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Naval Reactors					
Naval Reactors Operations and Infrastructure	356,300	362,800	390,000	445,196	+55,196
Naval Reactors Development	414,298	414,298	411,180	444,400	+33,220
S8G Prototype Refueling	144,400	144,400	126,400	133,000	+6,600
Ohio -Class Replacement Reactor Systems Development	126,400	126,400	156,100	186,800	+30,700
Program Direction	43,212	43,212	41,500	45,000	+3,500
Construction	24,373	24,373	113,320	121,100	+7,780
Subtotal, Naval Reactors	**1,108,983**	**1,115,483**	**1,238,500**	**1,375,496**	**+136,996**
Use of Prior Year Balances	-13,983	-13,983	0	0	0
Rescission of Prior Year Balances	0	0	-4,660	0	**+4,660**
Total, Naval Reactors Net of Rescissions	**1,095,000**	**1,101,500**	**1,233,840**	**1,375,496**	**+141,656**

Outyears for Naval Reactors Funding

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Naval Reactors				
Naval Reactors Operations and Infrastructure	454,320	469,951	535,587	546,917
Naval Reactors Development	441,700	466,600	498,200	518,100
S8G Prototype Refueling	124,000	190,000	250,000	215,000
Ohio -Class Replacement Reactor Systems Development	213,700	156,700	138,000	75,500
Program Direction	51,300	53,800	56,400	59,200
Construction	150,100	130,700	300,200	363,600
Subtotal, Naval Reactors	**1,435,120**	**1,467,751**	**1,778,387**	**1,778,317**
Use of Prior Year Balances	0	0	0	0
Rescission of Prior Year Balances	0	0	0	0
Total, Naval Reactors, Net of	**1,435,120**	**1,467,751**	**1,778,387**	**1,778,317**

[a] The annual total includes an allocation to NNSA from the Department of Defense's five year budget plan. The amount included for Naval Reactors is $469,503,000 in FY 2017, $393,440,000 in FY 2018, and $402,204,000 in FY 2019, and $409,008,000 in FY 2020.

Naval Reactors
Funding

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Naval Reactors					
Naval Reactors Operations and Infrastructure					
Research Reactor Facility Operations & Maintenance	85,449	85,449	119,279	138,670	+19,391
Laboratory Facility Regulation, Compliance, & Protection	83,140	83,140	87,200	93,046	+5,846
Nuclear Spent Fuel Management	132,136	132,136	111,100	133,767	+22,667
Radiological/Environmental Remediation & Demolition	55,575	55,575	48,721	59,168	+10,447
Capital Equipment	0	6,500	0	2,845	+2,845
General Plant Projects	0	0	23,700	17,700	-6,000
Total, Naval Reactors Operations and Infrastructure	**356,300**	**362,800**	**390,000**	**445,196**	**+55,196**
Naval Reactors Development					
Ship Construction & Maintenance Support	67,913	67,913	62,200	44,753	-17,447
Nuclear Reactor Technology	99,469	99,469	109,580	131,161	+21,581
Reactor Systems & Component Technology	180,416	180,416	162,700	185,271	+22,571
Advanced Test Reactor Operations	66,500	66,500	68,000	67,200	-800
Capital Equipment	0	0	8,700	16,015	+7,315
Total, Naval Reactors Development	**414,298**	**414,298**	**411,180**	**444,400**	**+33,220**
S8G Prototype Refueling	137,550	137,550	114,300	122,770	+8,470
Capital Equipment (MIE)	6,850	6,850	12,100	3,630	-8,470
General Plant Project (GPP)	0	0	0	6,600	+6,600
Total, S8G Prototype Refueling	**144,400**	**144,400**	**126,400**	**133,000**	**+6,600**
***Ohio* -Class Replacement Reactor Systems Development**	**126,400**	**126,400**	**156,100**	**186,800**	**+30,700**
Program Direction	**43,212**	**43,212**	**41,500**	**45,000**	**+3,500**
Construction	**24,373**	**24,373**	**113,320**	**121,100**	**+7,780**
Subtotal, Naval Reactors	**1,108,983**	**1,115,483**	**1,238,500**	**1,375,496**	**+136,996**
Use of Prior Year Balances	-13,983	-13,983	0	0	0
Rescission of Prior Year Balances	0	0	-4,660	0	+4,660
Total Naval Reactors, Net of Rescissions	**1,095,000**	**1,101,500**	**1,233,840**	**1,375,496**	**+141,656**

Outyears for Naval Reactors
Funding

	(Dollars in Thousands)			
Naval Reactors	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Naval Reactors Operations and Infrastructure				
Research Reactor Facility Operations & Maintenance	152,273	141,397	143,091	189,045
Laboratory Facility Regulation, Compliance, & Protection	91,155	93,717	95,823	99,106
Nuclear Spent Fuel Management	129,721	142,773	161,091	162,049
Radiological/Environmental Remediation & Demolition	55,871	61,164	81,382	71,817
Capital Equipment	2,600	4,500	2,000	2,000
General Plant Projects	22,700	26,400	52,200	22,900
Total, Naval Reactors Operations and Infrastructure	**454,320**	**469,951**	**535,587**	**546,917**
Naval Reactors Development				
Ship Construction & Maintenance Support	38,218	39,836	40,974	38,787
Nuclear Reactor Technology	136,611	149,758	162,131	162,919
Reactor Systems & Component Technology	187,671	194,706	210,395	219,894
Advanced Test Reactor Operations	68,600	70,000	71,400	72,900
Capital Equipment	10,600	12,300	13,300	23,600
Total, Naval Reactors Development	**441,700**	**466,600**	**498,200**	**518,100**
S8G Prototype Refueling	123,820	189,210	250,000	215,000
Capital Equipment (MIE)	180	790	0	0
General Plant Project (GPP)	0	0	0	0
Total, S8G Prototype Refueling	**124,000**	**190,000**	**250,000**	**215,000**
***Ohio*-Class Replacement Reactor Systems Development**	**213,700**	**156,700**	**138,000**	**75,500**
Program Direction	**51,300**	**53,800**	**56,400**	**59,200**
Construction	**150,100**	**130,700**	**300,200**	**363,600**
Total, Naval Reactors	**1,435,120**	**1,467,751**	**1,778,387**	**1,778,317**

Naval Reactors
Explanation of Major Changes
(Dollars in Thousands)

	FY 2016 vs FY 2015[a]
Naval Reactors Operations and Infrastructure: This funding increase (14%) will support critical prototype maintenance during planned S8G prototype availability period, facility and systems maintenance, and regulatory requirements across the Program's four DOE sites.	**+55,196**
Naval Reactors Development: This increase (8%) is primarily due to the purchase of an FY 2016 High Performance Computer and additional reactor core material development and radioactive test and evaluation efforts.	**+33,220**
S8G Prototype Refueling: This request increases (5%) as major development efforts and designs complete and efforts transition to supporting production and performing analysis needed to support future operation and project execution.	**+6,600**
***Ohio*-Class Replacement Reactor Systems Development:** Reflects an increase (20%) to support reactor plant system and long lead time component development and production plans. This increase is consistent with the project's planned funding profile.	**+30,700**
Program Direction: This increase (8%) is due to general inflationary increases and provides sufficient funding for the Program to execute its mission in light of the Consolidated and Further Continuing Appropriations Act, 2015.	**+3,500**
Construction: This increase (7%) is driven by the Spent Fuel Handling Recapitalization Project.	**+7,780**
Total, Naval Reactors	**+136,996**

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

Naval Reactors Performance Measures

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY2019	FY 2020
A1B Reactor Plant Design – Cumulative percentage of completion on the next-generation aircraft carrier reactor plant design.							
Target	99% complete	100% complete	N/A	N/A	N/A	N/A	N/A
Result	99.6						
Endpoint Target	By the end of FY 2015, complete 100% of the design of the reactor plant for the next-generation aircraft carrier.						
S1B Reactor Plant Design – Cumulative percentage of work complete on the *Ohio*-Class Replacement submarine reactor plant design.							
Target	22% complete	32% complete	43% complete	55% complete	65% complete	74% complete	80% complete
Result	25.7						
Endpoint Target	By the end of FY 2027, complete 100% of the *Ohio*-Class Replacement submarine reactor plant design.						

Note: In FY 2013, DoD delayed construction start for the lead ship by two years (from FY 2019 to FY 2021) and reactor plant advanced procurement from FY 2017 to FY 2019.

Naval Reactors
Program Direction

Description

Due to the essential nature of nuclear reactor work, Naval Reactors provides centrally controlled, technical management of all program operations. Federal employees directly oversee and set policies and procedures for developing new reactor plants, operating existing reactor 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.

Naval Reactors' Federal employees are typically recruited from a community of highly-trained military engineers who have completed a rigorous five-year on-the-job training program unique to Naval Reactors. This training program has groomed engineers with skill sets far beyond that of nuclear engineers found in the commercial and Federal sectors.

Travel funds are used to perform oversight activities of facilities located worldwide that require comprehensive audits and in-person visits to ensure compliance and safety. Additionally, Naval Reactors Representative positions at the field sites (to include locations in the United Kingdom, Japan, Hawaii, and the continental U.S.) rotate periodically due to retirements, attrition, and succession planning.

Other Related Expenses includes the maintenance of Naval Reactors' IT hardware, engineering software, and related licenses supporting mission-essential technical work. Additionally, these funds will support planned upgrades and maintenance of video teleconferencing equipment, security investigations of Federal personnel, and training requirements.

Highlights and Major Changes in the FY 2016 Budget Request

The Naval Reactors Program Direction budget reflects general inflationary increase for personnel and pay related costs. Despite recent and planned retirements that have resulted in a loss of NR's engineering experience, in FY 2016 NR will continue to reshape the workforce to manage knowledge transfer to ensure the accomplishment of the NR mission.

FY 2017-FY 2020 Key Milestones

NR plans to actively manage knowledge transfer.

Program Direction
Funding[a]

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Naval Reactors					
Headquarters					
Salaries and Benefits	20,697	20,697	20,950	21,719	+769
Travel	1,000	1,000	100	1,012	+912
Other Related Expenses	3,000	3,000	1,980	3,129	+1,149
Total, Headquarters	**24,697**	**24,697**	**23,030**	**25,860**	**+2,830**
Naval Reactors Laboratory Field Office					
Salaries and Benefits	16,615	16,615	16,950	16,748	-202
Travel	700	700	650	736	+86
Other Related Expenses	1,200	1,200	870	1,656	+786
Total, Naval Reactors Laboratory Field Office	**18,515**	**18,515**	**18,470**	**19,140**	**+670**
Total Program Direction					
Salaries and Benefits	37,312	37,312	37,900	38,467	+567
Travel	1,700	1,700	750	1,748	+998
Other Related Expenses	4,200	4,200	2,850	4,785	+1,935
Total, Program Direction	**43,212**	**43,212**	**41,500**	**45,000**	**+3,500**
Federal FTEs	**238**	**238**	**238**	**246**	**+8**

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

Other Related Expenses

(Dollars in Thousands)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Other Related Expenses					
Transportation	730	730	450	810	+360
Communications, Utilities and Miscellaneous Charges	340	340	220	377	+157
Other Services from Federal Sources	740	740	610	828	+218
Advisory and Assistance Services	300	300	220	331	+111
Operation and Maintenance of Facilities	210	210	160	239	+79
Operation and Maintenance of Equipment	520	520	440	672	+232
Supplies and Materials	200	200	200	248	+48
Equipment	1,160	1,160	550	1,280	+730
Total, Other Related Expenses	**4,200**	**4,200**	**2,850**	**4,785**	**+1,935**

Outyears Program Direction for Naval Reactors

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Naval Reactors				
Headquarters				
Salaries and Benefits	24,600	25,500	26,700	27,800
Travel	1,100	1,100	1,200	1,200
Other Related Expenses	3,800	4,600	5,000	5,500
Total, Headquarters	**29,500**	**31,200**	**32,900**	**34,500**
Naval Reactors Laboratory Field Office				
Salaries and Benefits	19,000	19,800	20,600	21,500
Travel	900	900	900	1,000
Other Related Expenses	1,900	1,900	2,000	2,200
Total, Naval Reactors Laboratory Field Office	**21,800**	**22,600**	**23,500**	**24,700**
Total Program Direction				
Salaries and Benefits	43,600	45,300	47,300	49,300
Travel	2,000	2,000	2,100	2,200
Other Related Expenses	5,700	6,500	7,000	7,700
Total, Program Direction	**51,300**	**53,800**	**56,400**	**59,200**
Federal FTEs	**246**	**246**	**246**	**246**

Outyears Other Related Expenses for Naval Reactors

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Other Related Expenses				
Transportation	910	970	1,020	1,190
Communications, Utilities and Miscellaneous Charges	430	470	500	530
Other Services from Federal Sources	950	1,030	1,060	1,120
Advisory and Assistance Services	380	420	460	480
Operation and Maintenance of Facilities	280	330	370	390
Operation and Maintenance of Equipment	860	1,050	1,160	1,250
Supplies and Materials	300	350	390	500
Equipment	1,590	1,880	2,040	2,240
Total, Other Related Expenses	**5,700**	**6,500**	**7,000**	**7,700**

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs FY 2015[a]
Salaries and Benefits $37,900,000	**Salaries and Benefits $38,467,000**	**Salaries and Benefits +$567,000**
• Federal salaries and benefits for employees that directly oversee and set policies and procedures for developing new reactor plants, operating existing reactor plants, facilities supporting these plants, contractors, and the Bettis and Knolls Atomic Power Laboratories.	• Federal salaries and benefits for employees that directly oversee and set policies and procedures for developing new reactor plants, operating existing reactor plants, facilities supporting these plants, contractors, and the Bettis and Knolls Atomic Power Laboratories.	• Reflects general inflationary increase for personnel and pay related costs.
Travel $750,000	**Travel $1,748,000**	**Travel +$998,000**
• Perform oversight activities of facilities located worldwide that require comprehensive audits and in-person visits to ensure compliance and safety. • Rotation of Naval Reactors Representatives at the field sites (U.K., Japan, Hawaii, and the continental U.S.) due to retirement, attrition, and succession planning.	• Perform oversight activities of facilities located worldwide that require comprehensive audits and in-person visits to ensure compliance and safety. • Rotation of Naval Reactors Representatives at the field sites (U.K., Japan, Hawaii, and the continental U.S.) due to retirement, attrition, and succession planning.	• Travel funding in FY 2015 was restricted due to Program Direction funding reduction.
Other Related Expenses $2,850,000	**Other Related Expenses $4,785,000**	**Other Related Expenses +$1,935,000**
• Maintenance of Naval Reactors' IT hardware, engineering software, and related licenses supporting mission essential technical work. • Support planned upgrades and maintenance of video teleconferencing equipment, security investigation of Federal personnel, and training requirements.	• Maintenance of Naval Reactors' IT hardware, engineering software, and related licenses supporting mission essential technical work. • Support planned upgrades and maintenance of video teleconferencing equipment, security investigation of Federal personnel, and training requirements.	• Reflects increase to support IT and maintenance operations.

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

Naval Reactors
Capital Summary[a]

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
Capital Operating Expenses Summary (including Major Items of Equipment (MIE))							
Capital Equipment >$500K (including MIE)	68,000	4,100	6,850	13,350	20,800	22,490	+1,690
General Plant Projects (GPP) (<$10M)	0	0	0	0	23,700	24,300	+600
Total, Capital Operating Expenses	**68,000**	**4,100**	**6,850**	**13,350**	**44,500**	**46,790**	**+2,290**
Capital Equipment > $500K (including MIE)							
Naval Reactors Operations and Infrastructure	0	0	0	0	0	845	+845
High Performance Computer (FY 2014 Buy)	6,500	0	0	6,500	0	0	0
Laboratory Network Upgrade	7,000	0	0	0	0	2,000	+2,000
Naval Reactors Development	0	0	0	0	8,700	5,015	-3,685
High Performance Computer (FY 2016 Buy)	11,000	0	0	0	0	11,000	+11,000
Land-based Prototype Ringer Crane Replacement	11,000	0	0	0	11,000	0	-11,000
Land-based Prototype Rod Control Equipment	11,800	1,300	3,700	3,700	0	1,800	+1,800
Land-Based Prototype Instrumentation and Control	20,700	2,800	3,150	3,150	1,100	1,830	+730
Total, Capital Equipment (including MIE)	**68,000**	**4,100**	**6,850**	**13,350**	**20,800**	**22,490**	**+1,690**
General Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)							
Total General Plant Projects (GPP) (Total Estimated Cost (TEC) >$5M)	0	0	0	0	19,916	15,600	-4,316
Total General Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	0	0	0	0	3,784	8,700	+4,916
Total, General Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**0**	**0**	**0**	**0**	**23,700**	**24,300**	**+600**
Total, Capital Summary	**68,000**	**4,100**	**6,850**	**13,350**	**44,500**	**46,790**	**+2,290**

[a] Funding changes from FY 2015 to FY 2016 are described in terms of the FY 2015 Enacted level exclusive of rescissions.

Outyears for Naval Reactors

(Dollars in Thousands)

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request
Capital Operating Expenses Summary (including Major Items of Equipment (MIE))				
Capital Equipment >$500K (including MIE)	13,380	17,590	15,300	25,600
General Plant Projects (GPP) (<$10M)	22,700	26,400	52,200	22,900
Total, Capital Operating Expenses	**36,080**	**43,990**	**67,500**	**48,500**
Capital Equipment > $500K (including MIE)				
Naval Reactors Operations and Infrastructure	600	2,500	0	0
Laboratory Network Upgrade	2,000	2,000	0	0
NRF Network Upgrade	0	0	2,000	2,000
Naval Reactors Development	7,600	1,300	8,800	5,400
High Performance Computers (FY 2018 Buy)	0	11,000	0	0
High Performance Computers (FY 2020 Buy)	0	0	0	11,000
Laser Electron Atom Probe	3,000	0	0	0
RML Shielded Microprobe Replacement	0	0	4,500	0
RML High Radiation Scanning Electron Microscope Replacement	0	0	0	5,000
Analytical Electrical Microscope	0	0	0	2,200
Land-Based Prototype Instrumentation and Control	180	790	0	0
Total, Capital Equipment (including MIE)	**13,380**	**17,590**	**15,300**	**25,600**
General Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)				
Total General Plant Projects (GPP) (Total Estimated Cost (TEC) >$5M)	5,523	5,323	265	6,480
Total General Plant Projects (GPP) (Total Estimated Cost (TEC) <$5M)	17,177	21,077	51,935	16,420
Total, General Plant Projects (GPP) (Total Estimated Cost (TEC) <$10M)	**22,700**	**26,400**	**52,200**	**22,900**
Total, Capital Summary	**36,080**	**43,990**	**67,500**	**48,500**

Naval Reactors
Construction Projects Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
08-D-190, Expended Core Facility M-290 Receiving/Discharge Station, NRF							
Total Estimated Cost (TEC)	92,765	91,065	1,700	1,700	400	0	-400
Other Project Cost (OPC)	4,423	3,485	0	0	260	0	-260
TPC, 08-D-190, Security Upgrades, KAPL	**97,188**	**94,550**	**1,700**	**1,700**	**660**	**0**	**-660**
10-D-903, Security Upgrades, KAPL							
TEC	22,891	2,091	0	0	7,400	500	-6,900
OPC	2,189	600	0	0	0	200	+200
TPC, 10-D-903, Security Upgrades, KAPL	**25,080**	**2,691**	**0**	**0**	**7,400**	**700**	**-6,700**
13-D-904, KS Radiological Work and Storage Building							
TEC	20,700	0	600	600	20,100	0	-20,100
OPC	1,000	300	100	100	100	400	+300
TPC, 13-D-904, KS Radiological Work and Storage Buliding	**21,700**	**300**	**700**	**700**	**20,200**	**400**	**-19,800**
13-D-905, Remote-Handled Low-Level Waste Disposal Project							
TEC	35,493	0	21,073	21,073	14,420	0	-14,420
OPC	7,970	1,310	1,075	1,075	570	3,640	+3,070
TPC, 13-D-905, Remote-Handled Low-Level Waste Disposal Project	**43,463**	**1,310**	**22,148**	**22,148**	**14,990**	**3,640**	**-11,350**
14-D-901, Spent Fuel Handling Recapitalization Project							
TEC	1,450,900	0	0	0	NA	NA	NA
OPC	195,600	96,900	24,600	24,600	NA	NA	NA
TPC, 14-D-901, Spent Fuel Handling Recapitalization Project[a]	**1,646,500**	**96,900**	**24,600**	**24,600**	**70,000**	**86,000**	**+16,000**

[a] The Consolidated and Further Continuing Appropriations Act, 2015 provides funding for Other Project Costs (OPC) within project funds beginning in FY 2015. All prior year funding was OPC.

Naval Reactors
Construction Projects Summary

(Dollars in Thousands)

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs FY 2015
14-D-902, KL Materials Characterization Laboratory							
TEC	31,000	0	1,000	1,000	0	30,000	+30,000
OPC	7,282	830	700	1,400	2,100	1,120	-980
TPC, 14-D-902, KL Materials Characterization Laboratory	**38,282**	**830**	**1,700**	**2,400**	**2,100**	**31,120**	**+29,020**
15-D-902, KS Engineroom Team Trainer Facility							
TEC	36,400	0	0	0	0	3,100	+3,100
OPC	2,220	200	0	0	700	1,020	+320
TPC, 15-D-902, KS Engineroom Team Trainer Facility	**38,620**	**200**	**0**	**0**	**700**	**4,120**	**+3,420**
15-D-903, KL Fire System Upgrade							
TEC	16,200	0	0	0	600	600	0
OPC	1,200	150	300	450	0	0	0
TPC, 15-D-903, KL Fire System Upgrade	**17,400**	**150**	**300**	**450**	**600**	**600**	**0**
15-D-904, NRF Overpack Storage Expansion 3							
TEC	15,700	0	0	0	400	900	+500
OPC	400	0	250	250	0	0	0
TPC, 15-D-904, NRF Overpack Storage Expansion 3	**16,100**	**0**	**250**	**250**	**400**	**900**	**+500**
Total All Construction Projects							
TEC	1,722,049	93,156	24,373	24,373	43,320	35,100	-8,220
OPC	222,284	103,775	27,025	27,875	3,730	6,380	+2,650
TPC, All Construction Projects	**1,944,333**	**196,931**	**51,398**	**52,248**	**117,050**	**127,480**	**+10,430**

Outyears to Completion for Naval Reactors

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
17-D-xxx, BL Fire System Upgrade					
TEC	1,400	0	13,200	0	0
OPC	50	150	250	100	0
TPC, 17-D-xxx, BL Fire System Upgrade	**1,450**	**150**	**13,450**	**100**	**0**
17-D-xxx, KL Fuel Development Laboratory					
TEC	1,000	0	0	23,700	0
OPC	0	0	300	0	1,200
TPC, 17-D-xxx, KL Fuel Development Laboratory	**1,000**	**0**	**300**	**23,700**	**1,200**
17-D-xxx, KS Overhead Piping West Side					
TEC	800	0	0	20,900	0
OPC	422	0	0	400	800
TPC, 17-D-xxx, KS Overhead Piping West Side	**1,222**	**0**	**0**	**21,300**	**800**
15-D-902, KS Engineroom Team Trainer Facility					
TEC	33,300	0	0	0	0
OPC	300	0	0	0	0
TPC, 15-D-902, KS Engineroom Team Trainer Facility	**33,600**	**0**	**0**	**0**	**0**
15-D-903, KL Fire System Upgrade					
TEC	0	15,000	0	0	0
OPC	0	600	0	0	0
TPC, 15-D-903, KL Fire System Upgrade	**0**	**15,600**	**0**	**0**	**0**
15-D-904, NRF Overpack Storage Expansion 3					
TEC	700	13,700	0	0	0
OPC	0	0	150	0	0
TPC, 15-D-904, NRF Overpack Storage Expansion 3	**700**	**13,700**	**150**	**0**	**0**

Outyears to Completion for Naval Reactors

	FY 2017 Request	FY 2018 Request	FY 2019 Request	FY 2020 Request	Outyears to Completion
14-D-901, Spent Fuel Handling Recapitalization Project					
TEC	NA	NA	NA	NA	NA
OPC	NA	NA	NA	NA	NA
TPC, 14-D-901, Spent Fuel Handling Recapitalization Projecta	**100,000**	**102,000**	**287,000**	**319,000**	**561,000**
14-D-902, KL Materials Characterization Laboratory					
TEC	0	0	0	0	0
OPC	150	1,500	182	0	0
TPC, 14-D-902, KL Materials Characterization Laboratory	**150**	**1,500**	**182**	**0**	**0**
13-D-904, KS Radiological Work and Storage Building	0	0	0	0	0
TEC	100	0	0	0	0
OPC	**100**	**0**	**0**	**0**	**0**
TPC, 13-D-904, KS Radiological Work and Storage Buliding					
13-D-905, Remote-Handled Low-Level Waste Disposal Project	0	0	0	0	0
TEC	1,375	0	0	0	0
OPC	**1,375**	**0**	**0**	**0**	**0**
TPC, 13-D-905, Remote-Handled Low-Level Waste Disposal Project					
10-D-903, Security Upgrades, KAPL					
TEC	12,900	0	0	0	0
OPC	361	350	678	0	0
TPC, 10-D-903, Security Upgrades, KAPL	**13,261**	**350**	**678**	**0**	**0**
Total All Construction Projects					
TEC	50,100	28,700	13,200	44,600	0
OPC	2,758	2,600	1,560	500	2,000
TPC, All Construction Projects	**152,858**	**133,300**	**301,760**	**364,100**	**563,000**

Department Of Energy
FY 2016 Congressional Budget
Funding By Appropriation By Site
($K)

Naval Reactors	FY 2014 Current	FY 2015 Enacted	FY 2016 Request
Bettis Atomic Power Laboratory			
Naval Reactors Program			
Naval Reactors Program	412,500	471,700	485,765
Total, Bettis Atomic Power Laboratory	**412,500**	**471,700**	**485,765**
Idaho National Laboratory			
Naval Reactors Program			
Naval Reactors Program	133,673	132,120	149,265
Total, Idaho National Laboratory	**133,673**	**132,120**	**149,265**
Knolls Atomic Power Laboratory			
Naval Reactors Program			
Naval Reactors Program	449,500	508,300	604,266
Total, Knolls Atomic Power Laboratory	**449,500**	**508,300**	**604,266**
Naval Research Laboratory			
Program Direction			
Program Direction	18,515	18,470	19,140
Total, Naval Research Laboratory	**18,515**	**18,470**	**19,140**
Washington Headquarters			
Naval Reactors Program			
Naval Reactors Program	76,598	84,880	91,200
Program Direction			
Program Direction	24,697	23,030	25,860
Total, Washington Headquarters	**101,295**	**107,910**	**117,060**
Total, Naval Reactors	**1,115,483**	**1,238,500**	**1,375,496**

GENERAL PROVISIONS – DEPARTMENT OF ENERGY
(INCLUDING TRANSFER [AND RESCISSIONS] OF FUNDS)

SEC. 301. (a) No appropriation, funds, or authority made available by this title for the Department of Energy shall be used to initiate or resume any program, project, or activity or to prepare or initiate Requests For Proposals or similar arrangements (including Requests for Quotations, Requests for Information, and Funding Opportunity Announcements) for a program, project, or activity if the program, project, or activity has not been funded by Congress.

(b)(1) Unless the Secretary of Energy notifies the Committees on Appropriations of the House of Representatives and the Senate at least 3 full business days in advance, none of the funds made available in this title may be used to—

(A) make a grant allocation or discretionary grant award totaling $1,000,000 or more;

(B) make a discretionary contract award or Other Transaction Agreement totaling $1,000,000 or more, including a contract covered by the Federal Acquisition Regulation;

(C) issue a letter of intent to make an allocation, award, or Agreement in excess of the limits in subparagraph (A) or (B); or

(D) announce publicly the intention to make an allocation, award, or Agreement in excess of the limits in subparagraph (A) or (B).

(2) The Secretary of Energy shall submit to the Committees on Appropriations of the House of Representatives and the Senate within 15 days of the conclusion of each quarter a report detailing each grant allocation or discretionary grant award totaling less than $1,000,000 provided during the previous quarter.

(3) The notification required by paragraph (1) and the report required by paragraph (2) shall include the recipient of the award, the amount of the award, the fiscal year for which the funds for the award were appropriated, the account and program, project, or activity from which the funds are being drawn, the title of the award, and a brief description of the activity for which the award is made.

(c) The Department of Energy may not, with respect to any program, project, or activity that uses budget authority made available in this title under the heading "Department of Energy—Energy Programs", enter into a multiyear contract, award a multiyear grant, or enter into a multiyear cooperative agreement unless—

(1) the contract, grant, or cooperative agreement is funded for the full period of performance as anticipated at the time of award; or

(2) the contract, grant, or cooperative agreement includes a clause conditioning the Federal Government's obligation on the availability of future year budget authority and the Secretary notifies the Committees on Appropriations of the House of Representatives and the Senate at least 3 days in advance.

(d) Except as provided in subsections (e), (f), and (g), the amounts made available by this title shall be expended as authorized by law for the programs, projects, and activities specified in the "Final Bill" column in the "Department of Energy" table included under the heading "Title III—Department of Energy" in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act).

(e) The amounts made available by this title may be reprogrammed for any program, project, or activity, and the Department shall notify the Committees on Appropriations of the House of Representatives and the Senate at least 30 days prior to the use of any proposed reprogramming which would cause any program, project, or activity funding level to increase or decrease by more than $5,000,000 or 10 percent, whichever is less, during the time period covered by this Act.

(f) None of the funds provided in this title shall be available for obligation or expenditure through a reprogramming of funds that—

(1) creates, initiates, or eliminates a program, project, or activity;

(2) increases funds or personnel for any program, project, or activity for which funds are denied or restricted by this Act; or

(3) reduces funds that are directed to be used for a specific program, project, or activity by this Act.

(g)(1) The Secretary of Energy may waive any requirement or restriction in this section that applies to the use of funds made available for the Department of Energy if compliance with such requirement or restriction would pose a substantial risk to human health, the environment, welfare, or national security.

(2) The Secretary of Energy shall notify the Committees on Appropriations of the House of Representatives and the Senate of any waiver under paragraph (1) as soon as practicable, but not later than 3 days after the date of the activity to which a requirement or restriction would otherwise have applied. Such notice shall include an explanation of the substantial risk under paragraph (1) that permitted such waiver.

SEC. 302. The unexpended balances of prior appropriations provided for activities in this Act may be available to the same appropriation accounts for such activities established pursuant to this title. Available balances 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. 303. 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 **[**2015**]***2016* until the enactment of the Intelligence Authorization Act for fiscal year **[**2015**]***2016*.

SEC. 304. None of the funds made available in this title shall be used for the construction of facilities classified as high-hazard nuclear facilities under 10 CFR Part 830 unless independent oversight is conducted by the Office of **[**Independent**]** Enterprise Assessments to ensure the project is in compliance with nuclear safety requirements.

SEC. 305. None of the funds made available in this title may be used to approve critical decision-2 or critical decision-3 under Department of Energy Order 413.3B, or any successive departmental guidance, for construction projects where the total project cost exceeds $100,000,000, until a separate independent cost estimate has been developed for the project for that critical decision.

[SEC. 306. (a) SECRETARIAL DETERMINATIONS.—In this fiscal year, and in each subsequent fiscal year, any determination (including a determination made prior to the date of enactment of this Act) by the Secretary of Energy under section 3112(d)(2)(B) of the USEC Privatization Act (110 Stat. 1321–335), as amended, shall be valid for not more than 2 calendar years subsequent to such determination.

(b) CONGRESSIONAL NOTIFICATION.—In this fiscal year, and in each subsequent fiscal year, not less than 30 days prior to the provision of uranium in any form the Secretary of Energy shall notify the Committees on Appropriations of the House of Representatives and the Senate of the following—

(1) the provisions of law (including regulations) authorizing the provision of uranium;

(2) the amount of uranium to be provided;

(3) an estimate by the Secretary of Energy of the gross fair market value of the uranium on the expected date of the provision of the uranium;

(4) the expected date of the provision of the uranium;

(5) the recipient of the uranium;

(6) the value the Secretary of Energy expects to receive in exchange for the uranium, including any adjustments to the gross fair market value of the uranium; and

(7) whether the uranium to be provided is encumbered by any restriction on use under an international agreement or otherwise.**]**

SEC. **[**307**]***306*. Notwithstanding section 301(c) of this Act, none of the funds made available under the heading "Department of Energy—Energy Programs—Science" may be used for a multiyear contract, grant, cooperative agreement, or Other Transaction Agreement of $1,000,000 or less unless the contract, grant, cooperative agreement, or Other Transaction Agreement is funded for the full period of performance as anticipated at the time of award.

[SEC. 308. In fiscal year 2015 and subsequent fiscal years, the Secretary of Energy shall submit to the congressional defense committees (as defined in U.S.C. 101(a)(16)) a report, on each major warhead refurbishment program that reaches the Phase 6.3 milestone, that provides an analysis of alternatives. Such report shall include—

(1) a full description of alternatives considered prior to the award of Phase 6.3;
(2) a comparison of the costs and benefits of each of those alternatives, to include an analysis of trade-offs among cost, schedule, and performance objectives against each alternative considered;
(3) identification of the cost and risk of critical technology elements associated with each alternative, including technology maturity, integration risk, manufacturing feasibility, and demonstration needs;
(4) identification of the cost and risk of additional capital asset and infrastructure capabilities required to support production and certification of each alternative;
(5) a comparative analysis of the risks, costs, and scheduling needs for any military requirement intended to enhance warhead safety, security, or maintainability, including any requirement to consolidate and/or integrate warhead systems or mods as compared to at least one other feasible refurbishment alternative the Nuclear Weapons Council considers appropriate; and
(6) a life-cycle cost estimate for the alternative selected that details the overall cost, scope, and schedule planning assumptions.**]**

[SEC. 309. (a) Unobligated balances available from prior year appropriations are hereby rescinded from the following accounts of the Department of Energy in the specified amounts:
(1) "Energy Programs—Energy Efficiency and Renewable Energy", $9,740,000.
(2) "Energy Programs—Electricity Delivery and Energy Reliability", $331,000.
(3) "Energy Programs—Nuclear Energy", $121,000.
(4) "Energy Programs—Fossil Energy Research and Development", $10,413,000.
(5) "Energy Programs—Science", $3,262,000.
(6) "Energy Programs—Advanced Research Projects Agency—Energy", $18,000.
(7) "Energy Programs—Departmental Administration", $928,000.
(8) "Atomic Energy Defense Activities—National Nuclear Security Administration— Weapons Activities", $6,298,000.
(9) "Atomic Energy Defense Activities—National Nuclear Security Administration— Defense Nuclear Nonproliferation", $1,390,000.
(10) "Atomic Energy Defense Activities—National Nuclear Security Administration— Naval Reactors", $160,000.
(11) "Atomic Energy Defense Activities—National Nuclear Security Administration—Office of the Administrator", $413,000.
(12) "Environmental and Other Defense Activities—Defense Environmental Cleanup", $9,983,000.
(13) "Environmental and Other Defense Activities—Other Defense Activities", $551,000.
(14) "Power Marketing Administrations—Construction, Rehabilitation, Operation and Maintenance, Western Area Power Administration", $1,632,000.
(b) No amounts may be rescinded by this section from amounts that were designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or the Balanced Budget and Emergency Deficit Control Act of 1985. **]**

[SEC. 310. (a) None of the funds made available in this or any prior Act under the heading "Defense Nuclear Nonproliferation" may be made available to enter into new contracts with, or new agreements for Federal assistance to, the Russian Federation.
(b) The Secretary of Energy may waive the prohibition in subsection (a) if the Secretary determines that such activity is in the national security interests of the United States. This waiver authority may not be delegated.
(c) A waiver under subsection (b) shall not be effective until 15 days after the date on which the Secretary submits to the Committees on Appropriations of the House of Representatives and the Senate, in classified form if necessary, a report on the justification for the waiver. **]**

[SEC. 311. Of the funds authorized by the Secretary of Energy for laboratory directed research and development, no individual program, project, or activity funded by this or any subsequent Act making appropriations for Energy and Water Development for any fiscal year may be charged more than the statutory maximum authorized for such activities: *Provided*, That this section shall take effect not earlier than October 1, 2015.**]**

[SEC. 312. (a) DOMESTIC URANIUM ENRICHMENT.—None of the funds appropriated by this or any other Act or that may be available to the Department of Energy may be used for the construction of centrifuges for the production of enriched uranium for national security needs in fiscal year 2015.

(b) The Department shall provide a report to the Committees on Appropriations of the House of Representatives and the Senate not later than April 30, 2015 that includes:

(1) an accounting of the current and future availability of low-enriched uranium, highly-enriched uranium, and tritium to meet defense needs; and

(2) a cost-benefit analysis of each of the options available to supply enriched uranium for defense purposes, including a preliminary cost and schedule estimate to build a national security train. **]**

[SEC. 313. None of the funds made available in this Act may be used—

(1) to implement or enforce section 430.32(x) of title 10, Code of Federal Regulations; or

(2) to implement or enforce the standards established by the tables contained in section 325(i)(1)(B) of the Energy Policy and Conservation Act (42 U.S.C. 6295(i)(1)(B)) with respect to BPAR incandescent reflector lamps, BR incandescent reflector lamps, and ER incandescent reflector lamps. **]**

[SEC. 314. None of the funds made available by this Act may be used in contravention of section 3112(d)(2)(B) of the USEC Privatization Act (42 U.S.C. 2297h-10(d)(2)(B)) and all public notice and comment requirements under chapter 6 of title 5, United States Code, that are applicable to carrying out such section.**]**

[SEC. 315. (a) NOTIFICATION OF STRATEGIC PETROLEUM RESERVE DRAWDOWN.—None of the funds made available by this Act or any prior Act, or funds made available in the SPR Petroleum Account, may be used to conduct a drawdown (including a test drawdown) and sale or exchange of petroleum products from the Strategic Petroleum Reserve unless the Secretary of Energy provides notice, in accordance with subsection (b), of such exchange, or drawdown (including a test drawdown) to the Committees on Appropriations of the House of Representatives and the Senate.

(b) (1) CONTENT OF NOTIFICATION.—The notification required under subsection (a) shall include at a minimum—

(A) The justification for the drawdown or exchange, including—

(i) a specific description of any obligation under international energy agreements; and

(ii) in the case of a test drawdown, the specific aspects of the Strategic Petroleum Reserve to be tested;

(B) the provisions of law (including regulations) authorizing the drawdown or exchange;

(C) the number of barrels of petroleum products proposed to be withdrawn or exchanged;

(D) the location of the Strategic Petroleum Reserve site or sites from which the petroleum products are proposed to be withdrawn;

(E) a good faith estimate of the expected proceeds from the sale of the petroleum products;

(F) an estimate of the total inventories of petroleum products in the Strategic Petroleum Reserve after the anticipated drawdown;

(G) a detailed plan for disposition of the proceeds after deposit into the SPR Petroleum Account; and

(H) a plan for refilling the Strategic Petroleum Reserve, including whether the acquisition will be of the same or a different petroleum product.

(2) TIMING OF NOTIFICATION.—The Secretary shall provide the notification required under subsection (a)—

(A) in the case of an exchange or a drawdown, as soon as practicable after the exchange or drawdown has occurred; and

(B) in the case of a test drawdown, not later than 30 days prior to a test drawdown.

(c) POST-SALE NOTIFICATION.—In addition to reporting requirements under other provisions of law, the Secretary shall, upon the execution of all contract awards associated with a competitive sale of petroleum products, notify the Committees on Appropriations of the House of Representatives and the Senate of the actual value of the proceeds from the sale.

(d) (1) NEW REGIONAL RESERVES.—The Secretary may not establish any new regional petroleum product reserve—

(A) unless funding for the proposed regional petroleum product reserve is explicitly requested in advance in an annual budget submission and approved by the Congress in an appropriations Act; or

(B) until 90 days after notification of, and approval by, the Committees on Appropriations of the House of Representatives and the Senate.

(2) The budget request or notification shall include—

(A) the justification for the new reserve;

(B) a cost estimate for the establishment, operation, and maintenance of the reserve, including funding sources;

(C) a detailed plan for operation of the reserve, including the conditions upon which the products may be released;

(D) the location of the reserve; and

(E) the estimate of the total inventory of the reserve.

(e) REPORT ON REFINED PETROLEUM PRODUCTS.—Not later than 180 days after the enactment of this Act, the Secretary shall submit to the Committees on Appropriations of the House of Representatives and the Senate a detailed plan for operation of the refined petroleum products reserve, including funding sources and the conditions upon which refined petroleum products may be released.

(f) REPORT ON STRATEGIC PETROLEUM RESERVE EXPANSION.—

(1) The Secretary, through the Office of Energy Policy and Systems Analysis, shall submit to the Committees on Appropriations of the House of Representatives and the Senate not later than 180 days after enactment of this Act the report required in Public Law 111–8 (123 Stat. 617) regarding the expansion of the Strategic Petroleum Reserve.

(2) The report required in paragraph (1) shall include an analysis of the impacts of Northeast Regional Refined Petroleum Product Reserve on the domestic petroleum market. **]** *(Energy and Water Development and Related Agencies Appropriations Act, 2015.)*

TITLE V – GENERAL PROVISIONS

SEC. 501. None of the funds appropriated by this Act may be used in any way, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913.

[SEC. 502. (a) None of the funds made available in title III of this Act may be transferred to any department, agency, or instrumentality of the United States Government, except pursuant to a transfer made by or transfer authority provided in this Act or any other appropriations Act for any fiscal year, transfer authority referenced in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act), or any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality.

(b) None of the funds made available for any department, agency, or instrumentality of the United States Government may be transferred to accounts funded in title III of this Act, except pursuant to a transfer made by or transfer authority provided in this Act or any other appropriations Act for any fiscal year, transfer authority referenced in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act), or any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality.

(c) The head of any relevant department or agency funded in this Act utilizing any transfer authority shall submit to the Committees on Appropriations of the House of Representatives and the Senate a semiannual report detailing the transfer authorities, except for any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality, used in the previous 6 months and in the year-to-date. This report shall include the amounts transferred and the purposes for which they were transferred, and shall not replace or modify existing notification requirements for each authority.**]**

SEC. **[**503**]***502*. None of the funds made available by this Act may be used in contravention of Executive Order No. 12898 of February 11, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). (*Energy and Water Development Related Agencies Appropriations Act, 2015*).