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**Statement of Lt. Gen. Frank G. Klotz, USAF (Ret)
Administrator
National Nuclear Security Administration
U.S. Department of Energy
on the
Fiscal Year 2017 President's Budget Request
Before the
Subcommittee on Strategic Forces
Senate Committee on Armed Services**

February 23, 2016

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year (FY) 2017 budget request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). It is a pleasure to be here this afternoon. We value this Committee's strong support for the nuclear security mission, and for the people and institutions that are responsible for executing it.

The President's FY 2017 budget request for NNSA is \$12.9 billion, this is an increase of \$357.5 million or 2.9% over the FY 2016 enacted level. The request is approximately 43% of the DOE's total budget, and 67% of DOE's total 050 budget.

The NNSA has a unique and special responsibility to maintain a safe, secure, and effective nuclear weapons stockpile for as long as nuclear weapons exist; to prevent, counter, and respond to evolving and emerging nuclear proliferation and terrorism threats; to provide nuclear propulsion to our Navy as it protects American and Allied interests around the world; and to support our outstanding NNSA federal workforce. By supporting overall growth, this budget request represents a strong endorsement of NNSA's vital and enduring missions, and is indicative of the Administration's unwavering commitment to a strong national defense.

NNSA's missions are accomplished through the hard work and innovative spirit of a highly talented federal and Management and Operating (M&O) workforce committed to public service. To provide this team the tools they need to carry out their complex and challenging task, both now and in the future, we must continue to modernize our scientific, technical, and engineering capabilities and infrastructure. In doing so, we are mindful of our obligation to continually improve our business practices, and to be responsible stewards of the resources that Congress and the American people have entrusted to us.

The FY 2017 budget request also reflects the close working partnership between NNSA and the Department of Defense (DoD). NNSA works closely with DoD to meet military requirements, support our Nation's nuclear deterrence capabilities and modernize the nuclear security enterprise. I would also note, that as in previous years, DoD is carrying in its FY 2017 budget request separate funding in FY 2018 and beyond that will be reallocated annually to NNSA's Weapons Activities and Naval Reactors.

I want to thank the committee for its support of the FY 2016 budget request and look forward to your continuing support in FY 2017. We have made some tough decisions and tradeoffs to meet both military commitments and nuclear security priorities. Without congressional support, modernization of our nuclear enterprise, implementation of our long-term stockpile sustainment strategy, and sustainment of our nonproliferation and prevention and response capabilities could be at risk. The program we have proposed is highly integrated and interdependent across the four accounts.

Details of the FY 2017 budget request for the NNSA follow:

Weapons Activities Appropriation

For the Weapons Activities account, the FY 2017 budget request is \$9.2 billion, an increase of \$396.2 million, or 4.5% above the FY 2016 enacted levels. This account provides funds for the Defense Programs portfolio, which is responsible for all aspects of the stockpile stewardship, management, and responsiveness programs; the enterprise-wide infrastructure sustainment activities managed by our Office of Safety, Infrastructure, and Operations; NNSA's physical and cybersecurity activities; and the secure transportation of nuclear materials.

Maintaining the Stockpile

Last year, the work of the science-based Stockpile Stewardship Program (SSP) allowed the Secretaries of Energy and Defense to certify to the President for the 20th time that the American nuclear weapons stockpile remains safe, secure, and reliable, without the need for underground explosive nuclear testing. This achievement is made possible each year by essential investments in state-of-the-art diagnostic tools, high performance computing platforms, and modern facilities, which are staffed by NNSA's world-class scientists, engineers, and technicians.

For Directed Stockpile Work (DSW), the FY 2017 budget request is \$3.3 billion, a decrease of \$57.3 million, or 1.7% below the FY 2016 enacted levels. These reductions will not restrict NNSA's ability to annually assess system performance and reliability or maintain the schedule for Life Extension Programs (LEP).

The major LEPs are a fundamental part of this account. The \$222.9 million requested for the W76-1 warhead LEP directly supports the Navy and will keep the LEP on schedule and on budget to complete production in FY 2019. We continue to make good progress on the B61-12 LEP, which will consolidate four variants of the B61 gravity bomb and will improve the safety and security of the oldest weapon system in the U.S. nuclear arsenal. With the \$616.1 million requested, we will remain on schedule to deliver the First Production Unit (FPU) in FY 2020. NNSA is responsible for the refurbishment of the nuclear explosives package and new bomb electronics, while the Air Force will provide the tail kit assembly under a separate acquisition program. When fielded, the B61-12 bomb will support both Air Force strategic long-range

nuclear-capable bombers and dual-capable fighter aircraft, providing extended deterrence to our allies and partners, and allow retirement of the last megaton class weapon in the inventory, the B83 gravity bomb.

In July 2015, we began Phase 6.2 (Feasibility Study and Design Options) for the W80-4 cruise missile warhead LEP. The FY 2016 budget request included \$195 million to accelerate the FPU by two years to FY 2025, a decision made by the Nuclear Weapons Council (NWC) in late 2014. The FY 2015 budget request included \$10 million to start the program. We had initially planned a ramp-up of Phase 6.2 study activities beginning in FY 2016 to support the NWC FPU decision. However, as a result of the FY 2016 continuing resolution, we were unable to begin the planned ramp-up activities until just recently. Furthermore, because of the delay in receiving FY 2016 funding, the program cannot execute the full FY 2016 enacted amount this year. As a result, a significant amount of the program's FY 2016 funding will carry over into FY 2017. Consequently, the FY 2017 budget request is \$25.3 million over the FY 2016 budget request, rather than \$117 million over the FY 2016 budget request, as previously projected. While this delayed start will affect planned technology maturation activities in Phase 6.2A (Design Definition and Cost Study), we still fully expect to meet the planned FPU date in FY 2025 to support the Air Force Long Range Stand Off (LRSO) program.

In FY 2015, the NWC approved additional scope for the W88 Alteration (ALT) 370 to meet an emerging requirement. NNSA is now accelerating the new Conventional High Explosive (CHE) refresh work to match the original ALT schedule. As a result, we are synchronizing the full program to transition seamlessly to the Production Engineering phase in February 2017. In preparation for that phase transition, NNSA will publish a baseline cost report by the end of this fiscal year. This budget request reflects these efforts and includes \$281.1 million in FY 2017 to support the FPU in FY 2020.

Also within DSW, the FY 2017 budget request includes \$1.3 billion for Stockpile Systems and Stockpile Services. These programs sustain the stockpile pursuant to the direction given in the President's Nuclear Weapon Stockpile Plan (NWSP). In doing so, the programs deploy unique skills, equipment, testers, and logistics to enable the daily operations of the nation's nuclear deterrent. Specifically, these programs produce and replace limited life components (LLCs) such as neutron generators and gas transfer systems, conduct maintenance, surveillance, and evaluations to assess weapons reliability, detect and anticipate potential weapons issues such as the recent CHE refresh issue mentioned above, and compile and analyze information during the Annual Assessment process.

The pursuit and application of technological advancements to enhance safety and security while reducing life cycle costs of the stockpile runs through all of these activities. The development of Integrated Surety Architectures enhancing transportation safety and security is an example of these efforts.

Within DSW, the FY 2017 budget request also includes \$577.8 million for the Strategic Materials account to maintain NNSA's ability to produce the nuclear and other materials needed to

support the enduring stockpile. This program includes Uranium Sustainment, Plutonium Sustainment, Tritium Sustainment, Domestic Uranium Enrichment (DUE), lithium and other strategic materials. Funding for Uranium Sustainment will enable enriched uranium operations in Building 9212, a Manhattan Project-era production facility at the Y-12 National Security Complex in Oak Ridge, Tennessee, to end in FY 2025, and allow the bulk of this obsolete building to shut down. The sustainment and modernization of enriched uranium capabilities and the acceleration of Area 5 de-inventory will reduce safety and mission risks in the near term.

Plutonium Sustainment funds replacement and refurbishment of equipment and the critical skills needed to meet the pit production requirements as outlined in the National Defense Authorization Act (NDAA) for Fiscal Year 2015.

Tritium Sustainment ensures the Nation's capability and capacity to provide the tritium necessary to meet national security requirements, either through production at Tennessee Valley Authority nuclear power plants or by recovering and recycling tritium from returned gas transfer systems.

The DUE program continues its efforts to ensure that we have the necessary supplies of enriched uranium for a variety of national security needs.

The FY 2017 budget request also includes \$69 million for Weapons Dismantlement and Disposition, an increase of \$16.9 million, 32.7% above the FY 2016 enacted level, which includes funds to support the President's goal to accelerate the dismantlement rate of previously retired weapons by 20%. This will enable NNSA to dismantle the weapons retired prior to FY 2009 by 2021, rather than the original goal of 2022. It will also result in increased Management and Operating staff at both the Pantex Plant in Amarillo, Texas and the Y-12 National Security Complex.

For Research, Development, Test, and Evaluation (RDT&E), the FY 2017 budget request is \$1.9 billion, an increase of \$36.2 million, 2% above the FY 2016 enacted level. This includes \$663.2 million for the Advanced Simulation and Computing (ASC) Program, an increase of \$31 million for the Advanced Technology Development and Mitigation (ATDM) subprogram that supports high performance computing on the path to exascale, and \$87.1 million for Advanced Manufacturing Development (AMD), a decrease of \$43 million. The decrease reflects a realignment from technology development investments to address higher NNSA priorities. The budget request focuses on continued investment in advanced manufacturing opportunities and improving the manufacturing processes for components that support multiple weapons to maximize the benefits of these investments. Advanced Manufacturing invests in technologies that will reduce the time and cost of current manufacturing methods, replaces obsolete processes, and supports manufacturing developments for future weapon upgrades. Additive Manufacturing, also known as 3-D printing, aids in developing and manufacturing components for stockpile and weapon technology applications. The overall RDT&E request reflects small increases for the Science Program (\$442.0 million, an increase of \$18.9 million) to achieve two

subcritical experiments per year before the end of the FYNSP, and begin alterations to U1a tunnel complex at Nevada to prepare for these experiments: Inertial Confinement Fusion Ignition and High Yield Program (\$523.9 million, an increase of \$11.9 million) and the Engineering Program (\$139.5 million, an increase of \$8.1 million).

The Inertial Confinement Fusion Ignition and High Yield program has spearheaded ongoing improvements in management and operational efficiencies at NNSA's major high energy density (HED) facilities, including the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL) in California and the OMEGA facility at the University of Rochester in New York. In FY 2015, NIF markedly improved its shot-rate efficiency with over 350 key experiments performed (compared to 191 in FY 2014) in support of the SSP. This level of effort represents an 85% increase over the previous year and an 18% increase over its goal for 2015.

NNSA has taken major steps in high performance computing to deliver on its missions and play a leading role to support the President's Executive Order on the National Strategic Computing Initiative (NSCI). In 2015, Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL) received the first hardware delivery for NNSA's next generation high performance computer, Trinity. This computer will initially have eight times more applications performance than the Cielo machine it is replacing. NNSA also continued its CORAL collaboration with LLNL, the DOE Office of Science national laboratories at Oak Ridge and Argonne, IBM, and other vendors. CORAL will help develop next generation computing platforms to dramatically improve our ability to run increasingly complex codes and will be a significant step on the path to exascale computing.

NNSA collaborates with the DOE Office of Science while making these much needed investments in exascale computing. The FY 2017 budget request includes \$95 million from NNSA for the development of capable exascale systems.

Defense Programs also maintains the vitality of the broader National Security Enterprise. An important aspect of this effort is investing in Laboratory-, Site- and Plant-Directed Research and Development (LDRD/PDRD). Independent reviews have consistently affirmed the importance of the program to the long-term vitality of the labs. LDRD/PDRD provides basic research funding to foster innovation and to attract and retain young scientific and technical talent and is critical to the long-term sustainment of our national laboratories. Congressional support is essential to ensuring that we have both the workforce and the new developments necessary to support the nation's security into the future.

Improving Safety, Operations and Infrastructure

NNSA's ability to achieve its mission is dependent upon safe and reliable infrastructure. The age and condition of NNSA's infrastructure will, if not addressed, put the mission, the safety of our workers, the public, and the environment at risk. More than half of NNSA's facilities are over 40 years old while 30% of them date back to the Manhattan Project era. The FY 2017 budget request for Infrastructure and Operations is \$2.7 billion, an increase of \$442.8 million,

19.4% above the FY 2016 enacted level. This funding will help NNSA modernize and upgrade aging infrastructure and address safety and programmatic risks through strategic investments in both general purpose infrastructure and program-specific capabilities that directly support our nuclear weapons and nonproliferation programs.

To support critical programmatic activities, we are making important strides in recapitalizing our aging infrastructure and capabilities. In FY 2015, NNSA funded new and continuing projects to enhance or replace programmatic capabilities and address the risks posed by the aging infrastructure. NNSA's investment in these projects is vital to the revitalization of the NNSA enterprise. The FY 2017 budget request provides funding for more than 70 recapitalization projects. The request will also support general purpose infrastructure and program-specific capabilities through Line Item Construction projects. These projects include, for example, the Uranium Processing Facility (UPF), the Chemistry and Metallurgy Research Replacement (CMRR) project, the U1a Complex Enhancements Project (UCEP) in support of the Enhanced Capabilities for Subcritical Experiments (ECSE) portfolio, the Albuquerque Complex Project to replace the current inadequate facilities, and a project to expand the electrical distribution system at LLNL.

One of the most worrisome of the NNSA infrastructure challenges is the excess facilities that pose risks to our workers, the environment, and the mission. While many of these facilities will ultimately be transferred to the DOE Office of Environmental Management for disposition, NNSA is focusing on reducing the risk where it can. In FY 2015, NNSA successfully demolished our second non-process contaminated building at Y-12 within the past two calendar years. The FY 2017 budget request supports a number of activities to continue to address excess facilities. These activities include the transition of the Kansas City Bannister Federal Complex to the private sector for environmental remediation and redevelopment, risk reduction activities at Alpha-5 and Beta-4 at Y-12 – both of which are highly process-contaminated – and disposition of more uncontaminated facilities across the NNSA enterprise.

Our Secure Transportation Asset (STA) program provides safe, secure movement of nuclear weapons, special nuclear material, and weapon components to meet projected DOE, DoD, and other customer requirements. The FY 2017 budget request of \$282.7 million includes an increase of \$45.6 million, 19.2% above the FY 2016 enacted levels, to continue asset modernization and workforce capability initiatives. These initiatives include: (1) restoration of federal agent strength levels to meet the goal of 370; (2) the Safeguards Transporter (SGT) Risk Reduction Initiatives to manage the SGT beyond its design life; (3) development and testing of the selected alternative for the SGT replacement, the Mobile Guardian Transporter (MGT); and (4) replacement of vehicles and tractors.

The Office of Defense Nuclear Security (DNS) develops and implements sound security programs to protect Special Nuclear Material (SNM), people, information, and facilities throughout the nuclear security enterprise. The FY 2017 budget request is \$670.1 million, a decrease of \$12.8 million, or 1.9% below the FY 2016 the enacted level of \$682.9 million due to one-time dedicated increases in FY 2016. After adjusting for an FY 2016 one-time \$30 million

designated plus up and \$13 million dedicated line item construction amounts for each year, the remaining FY 2017 operating request of \$657.1 million is an increase of \$17.2 million, or 2.7% above the FY 2016 enacted operating level of \$639.9 million. The request manages risk among important competing demands as NNSA continues to face the challenges associated with an aging physical security infrastructure that must be effectively addressed in the coming years. To this end, DNS is conducting a Site Condition Review (SCR) of the physical security systems at all locations to facilitate the development of an enterprise-wide security systems upgrade and refresh strategy. This effort will identify and manage current and future security improvements and upgrades on a 10-year planning cycle and includes determining the condition of critical security equipment and infrastructure. A final report of this effort will provide DOE/NNSA leadership and Congressional stakeholders with consolidated and up-to-date information to enable informed decisions for fiscal planning and programming.

The SCR is being conducted within the context of important organizational improvements and management strategies published in the June 2015 Security Roadmap. The document establishes a clear vision and path forward to correcting identified security issues and promoting sustained performance within the NNSA security program. The Security Roadmap is a multi-year effort that implements key recommendations for improvement identified in past assessments; it includes a total of 57 strategic initiatives covering culture, process, infrastructure, and workforce challenges. As of the end of 2015, DNS has completed six of the initiatives and is currently working on another 20 initiatives. The remaining 31 initiatives are pending formal initiation.

For Information Technology and Cybersecurity, the FY 2017 budget request is \$176.6 million, an increase of \$19 million, or 12.1% above FY 2016 enacted levels. This increase will fund much needed improvement to the Information Technology and Cybersecurity program, including Continuous Diagnostic and Mitigation (CDM), Telecommunications Security, infrastructure upgrades for the Enterprise Secure Computing Network (ESN), Public Key Infrastructure (PKI), Energy Sciences Network (ESnet) program, and an increased Information Technology budget. This cybersecurity program continuously monitors enterprise wireless and security technologies (e.g., identity, credential, and access management) to meet a wide range of security challenges. In FY 2017, NNSA plans to continue the recapitalization of the Enterprise Secure Network, modernize the cybersecurity infrastructure, implement the Identity Control and Access Management project at NNSA Headquarters and site elements, and implement all Committee on National Security Systems and PKI capabilities.

Defense Nuclear Nonproliferation Appropriation

The Defense Nuclear Nonproliferation (DNN), FY 2017 budget request is \$1.8 billion, a decrease of \$132.4 million, 6.8% below the FY 2016 enacted levels. This appropriation covers NNSA's nuclear threat reduction mission. DNN addresses the entire nuclear threat spectrum by helping to prevent the acquisition of nuclear weapons or weapon-usable materials, technologies, and expertise, countering efforts to acquire such weapons, materials, and technologies, and responding to nuclear and radiological incidents. The FY 2017 budget request funds two

mission areas under the DNN appropriation: the Defense Nuclear Nonproliferation Program and the Nuclear Counterterrorism and Incident Response (NCTIR) Program.

Nonproliferation Efforts

NNSA made significant progress in nuclear threat reduction in 2015. Working with foreign partners, the Office of Defense Nuclear Nonproliferation removed approximately 170 kilograms of highly enriched uranium (HEU) and plutonium from several civilian sites; successfully down-blended additional HEU to achieve a cumulative total of 150 metric tons of U.S. excess, weapons-usable HEU (approximately 6,000 nuclear weapons worth of material); recovered more than 100,000 curies of disused or orphaned radioactive material; ensured the United States remains on track to fulfill the commitments made at the 2014 Nuclear Security Summit; and supported the Secretary of Energy's efforts to develop the Joint Comprehensive Plan of Action (JCPOA) by providing scientific expertise and technical options to the United States negotiating team.

The Material Management and Minimization (M³) program provides an integrated approach to addressing the threat posed by nuclear materials through a full cycle of materials management and minimization. The primary objective of the program is to achieve permanent threat reduction by minimizing and, when possible, eliminating weapons-usable nuclear material around the world. The FY 2017 budget request is \$341.1 million, an increase of \$24.5 million, 7.7% above the FY 2016 enacted levels. This funding increase will accelerate reactor conversions in Kazakhstan and in the United States, as well as initiate the critical decision process to support the dilute and dispose program for domestic plutonium disposition.

The Global Material Security (GMS) program works with partner nations to increase the security of vulnerable nuclear and radiological materials and improve their ability to detect, interdict, and investigate illicit trafficking of these materials. The FY 2017 budget request for this program is \$337.1 million, a decrease of \$89.6 million, 21% below the FY 2016 enacted level. This decrease is possible because GMS is completing its work to protect the remaining International Atomic Energy Agency (IAEA) Category I radiological sources in the United States to meet our 2014 Nuclear Security Summit commitment, and because GMS is committed to reducing its prior year carryover balances.

The Nonproliferation and Arms Control (NPAC) program supports the nonproliferation and arms control regimes by developing and implementing programs to strengthen international nuclear safeguards; control the spread of nuclear and dual-use material, equipment, technology and expertise; verify nuclear reductions and compliance with nonproliferation and arms control treaties and agreements; and address other nonproliferation and arms control challenges. The FY 2017 budget request will fund safeguards and export control activities, including efforts specifically in support of JCPOA implementation. This funding also supports statutorily mandated activities such as technical reviews of export licenses and interdiction cases, technical support for the negotiation and implementation of civil nuclear cooperation agreements (123 Agreements), and upgrades to the 10 CFR 810 authorization process. The FY

2017 budget request for this program is \$124.7 million, a decrease of \$5.5 million, 4.2% below the FY 2016 enacted level. This decrease primarily reflects a return to baseline funding following the one-time increase of \$3.5 million by Congress in the FY 2016 budget for improvements in the export control process, as well as cost-savings in export licensing activities achieved through operational efficiencies.

The DNN Research and Development (DNN R&D) program supports innovative 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) nuclear detonations. To meet national and Departmental nuclear security requirements, DNN R&D leverages the unique facilities and scientific skills of DOE, academia, and industry to perform research, including counterterrorism-related R&D. The FY 2017 budget request for this program is \$393.9 million, a \$25.4 million or 6.1% decrease below FY 2016 enacted levels. The decrease in funding reflects projected savings resulting from a reduction in planned activities for arms control-related R&D and a return to the baseline Nuclear Detonation Detection (NDD) program after development of an initial mitigation path for supply chain interruptions.

Nonproliferation Construction consolidates construction costs for DNN projects. Currently, the MOX Fuel Fabrication Facility (MFFF) is the only project in this program; however, the FY 2017 budget request terminates the MOX project. The Department will complete pre-conceptual design for the dilute and dispose approach to establish Critical Decision-0 (CD-0), Approve Mission Need, and begin conceptual design in late FY 2017. The FY 2017 budget request of \$270 million will be used to bring an orderly and safe closure of the MFFF. The scope and costs will be refined in subsequent budget submissions when the termination plan for the MFFF project is approved.

Nuclear Counterterrorism and Emergency Operations

DOE has adopted an enterprise-wide approach to strengthen overall preparedness to respond to a broad spectrum of potential emergencies. These emergencies include natural phenomena, such as adverse weather events or earthquakes, and man-made events, such as accidents or acts of terrorism. To better accomplish this mission, in November 2015, NNSA reorganized the Office of Emergency Operations and the Office of Counterterrorism and Counterproliferation.

Both of these organizations are supported under the Nuclear Counterterrorism and Incident Response (NCTIR) Program. In FY 2016, the NCTIR program transitioned to the DNN account in order to align all NNSA funding to prevent, counter, and respond to nuclear proliferation and terrorism. The FY 2017 budget request includes \$271.9 million to support the NCTIR program, an increase of \$37.5 million, 16% above the FY 2016 enacted level. Within NCTIR, NNSA continues to work domestically and around the world to prepare for and improve our ability to respond to radiological or nuclear incidents.

Our counterterrorism and counterproliferation programs are part of broader U.S. Government efforts assessing the threat of nuclear terrorism and to develop technical countermeasures. The scientific knowledge generated under this program ensures that NNSA's technical expertise

on nuclear threat devices, including improvised nuclear devices (INDs), supports and informs broader U.S. Government nuclear security policy and guides nuclear counterterrorism and counterproliferation efforts, including interagency nuclear forensics and DoD contingency planning.

NNSA's emergency response teams must deploy and respond with the most up to date equipment. The current equipment is aging, increasing maintenance expenses, and has started to impact NNSA's ability to perform its emergency response mission. The Radiological Assistance Program (RAP) remains the nation's premier first-response resource to assess a radiological incident and advise decision-makers on necessary steps to minimize hazards, but its effectiveness is beginning to be compromised by obsolete equipment. To ensure that NNSA is able to execute its radiological emergency response mission, RAP's equipment must be recapitalized regularly. Additionally, NNSA is acquiring state-of-the-art, secure, deployable communications systems that are interoperable with our Federal Bureau of Investigation and DoD mission partners, ensuring decision makers receive real-time technical recommendations to mitigate nuclear terrorist threats.

The Office of Emergency Operations is now aligned to focus on its core Department-wide all-hazards and complex-wide emergency management mission. The FY 2017 budget request for this office is \$34.7 million, an increase of \$9.6 million, or 38% above the FY 2016 enacted level. This will improve the emergency management system through an enterprise-wide approach that effectively increases the Department's all-hazards emergency preparedness and response capability during complex, cascading, or enduring incidents, and more effectively calls upon and leverages the assets, resources, and skills across the DOE complex. The Emergency Operations Center (EOC) will continue to be the 24/7/365 single-point-of-contact for Departmental and interagency notifications regarding situations requiring centralized management such as, national emergencies, heightened international tension, Departmental emergencies, natural disasters, or acts of terrorism. The program also manages the Emergency Communications Network, and Continuity Programs for all of DOE, including NNSA. The Office of Emergency Operations will continue to work within the DOE to develop plans to replace the existing EOC and to improve the Department's capabilities to respond to emergencies.

Naval Reactors Appropriation

Advancing Naval Nuclear Propulsion

NNSA supports the U.S. Navy's ability to protect and defend American interests across the globe. The Naval Reactors Program remains at the forefront of technological developments in naval nuclear propulsion and ensures a commanding edge in warfighting capabilities by advancing new technologies and improvements in naval reactor performance and reliability.

In 2015, Naval Reactors enabled U.S. nuclear powered warships to operate for another year safely and effectively, steaming more than two million miles in support of national security missions. Initial reactor start-up was achieved in the lead reactor plant of pre-commissioning unit (PCU) GERALD R. FORD (CVN 78), the first new design aircraft carrier propulsion plant in 40

years. This historic milestone represents the culmination of almost 20 years of dedicated and sustained effort by Naval Reactors and its field activities, our Department of Energy laboratories, nuclear industrial base suppliers, the Navy design team and the nuclear shipbuilders. This is the first step in fully testing the integrated operations of the propulsion plant, culminating in sea trials this spring. Finally, we continued our reactor plant design and reactor core manufacturing development efforts in support of the new design OHIO-class Replacement reactor plant, including the life-of-ship core.

The Naval Reactors FY 2017 budget request is \$1.42 billion, an increase of \$45 million, 3.2% above the FY 2016 enacted level. In addition to supporting today's operational fleet, the requested funding will enable Naval Reactors to deliver tomorrow's fleet by funding three national priority projects, and recruiting and retaining a highly skilled work force committed to the Navy and the nation. The projects include (1) continuing design of the new reactor plant for the replacement of the OHIO-class SSBN, which will feature a life-of-ship core and electric drive; (2) refueling a Research and Training Reactor in New York to facilitate OHIO-class Replacement reactor development efforts and provide 20 more years of live reactor based training for fleet operators; and (3) building a new spent fuel handling facility in Idaho that will facilitate long term, reliable processing and packaging of spent nuclear fuel from aircraft carriers and submarines.

Naval Reactors has requested funding in FY 2017 to support these projects, and to fund necessary reactor technology development, equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing a small but high-performing technical base, the teams at our four Program sites – the Bettis Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and our spent nuclear fuel facilities in Idaho – we can perform the research and development, analysis, engineering and testing needed to support today's fleet at sea and develop future nuclear-powered warships. Importantly, our labs perform the technical evaluations that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses that ensure nuclear safety and maximize operational flexibility. This technical base supports more than 15,000 nuclear-trained Navy sailors, who safely maintain and operate the 98 nuclear propulsion plants in the fleet 24 hours per day, 365 days per year around the globe. It will also facilitate delivery, as directed by Congress, of our conceptual plan for potential naval application of low enriched uranium.

NNSA Federal Salaries and Expenses Appropriation

The NNSA Federal Salaries and Expenses (FSE) FY 2017 budget request is \$412.8 million, an increase of \$49.1 million, 13.5% above the FY 2016 enacted level. The FY 2017 budget request provides funding for 1,715 full-time equivalents (FTE) and support expenses needed to meet mission requirements. We are actively engaged in hiring to that number in a thoughtful and strategic manner. The FY 2017 budget request will support 1,715 FTEs, an increase of 60 FTEs (25 above the authorized 1,690) above the anticipated number of FTEs in FY 2016, and request an additional 25 for a total of 1,740 FTEs in FY 2018 and the outyears. The exact number of

FTEs will be determined following a detailed staffing review. It also provides for a 1.3% cost of living increase and a 5.5% increase for benefit escalation. In addition, the request provides funding for additional Federal Background Investigations for security clearances and provides additional funding to the Department's Working Capital Fund, primarily for Office of Personnel Management (OPM) credit monitoring and the Department's accounting systems (iMANAGE).

In FY 2017, NNSA will continue its efforts to meet current and future workforce needs by analyzing how evolving missions are affecting job requirements. Reshaping of the workforce over the next several years will be essential, including identifying the right staffing size and skill sets and implementing professional development plans now and in the future. NNSA will also continue to streamline its operations, particularly in travel and support services, to provide a lean and efficient organization.

Management & Performance

To enhance our ability to carry out our mission and execute this budget request, we will continue to focus on improving our project management and cost estimating capabilities. In keeping with the Secretary of Energy's increased focus on Management and Performance, NNSA is committed to managing its operations, contracts and costs in an effective and efficient manner. The NNSA's Office of Acquisition and Project Management (APM) is driving continued improvement in contract and project management practices. APM is leading NNSA's effort to institute rigorous analyses of alternatives, provide clear lines of authority and accountability for federal and contractor program and project management, improve cost and schedule performance, and ensure Federal Project Directors and Contracting Officers with the appropriate skill mix and professional certifications are managing NNSA's work. NNSA participates in the Secretary of Energy's Project Management Risk Committee as a means to institutionalize and share best practices across the Department. NNSA established the Office of Project Assessments, reporting directly to the Principal Deputy Administrator, ensuring senior leadership visibility and accountability throughout the Enterprise for project performance. This office generated \$33 million in cost avoidances as a result of their independent project peer reviews.

Since 2011, NNSA has delivered approximately \$1.4 billion in projects, a portion of NNSA's total project portfolio, \$70 million (or 5%) under original budget. Significant examples in the last year include the Uranium Processing Facility (UPF) Site Readiness Subproject, which delivered \$20 million under budget; Y-12's Nuclear Facility Risk Reduction Project, which delivered \$6 million under budget and 11 months ahead of schedule; and LANL's Transuranic Waste Facility Project, which is on track to complete \$3 million under budget. Using the Department's best practices, the UPF and Chemistry and Metallurgy Research Replacement Facility Projects were restructured into smaller more manageable subprojects, significantly reducing project delivery risk.

NNSA is committed to encouraging competition and increasing the universe of qualified contractors, by streamlining its major acquisition processes. The most significant example was

the competitive award of the Kansas City National Security Campus M&O contract, awarded without protest, saving taxpayers \$150 million and increasing the use of small businesses. As an affirmation of the quality of NNSA's acquisition management team, only four out of 103 competitive procurements were protested, with NNSA winning all protests. Finally, NNSA exceeded its small business goal by over 20%, awarding \$233 million to small business in FY 2015.

NNSA will continue to focus on delivering timely, best-value acquisition solutions for all of our programs and projects. NNSA will use a tailored approach to contract structures and incentives that is appropriate for the unique missions and risks at each site. Our M&O contractors are responsible for disparate activities, ranging from research and development to industrial production. Accordingly, we will work to develop the right incentives for each circumstance and for each of our contracts.

Cost Estimating and Program Evaluation

The Office of Cost Estimating and Program Evaluation (CEPE) continues to develop its capabilities to provide trusted independent cost and resource analysis of NNSA's programs and projects. As detailed in its implementation plan, the number of CEPE federal staff will grow from a target of 15 in FY 2016 to 18 in FY 2017. CEPE will conduct independent cost estimates on the B61-12 LEP and W88 Alt 370 in FY 2016 and the W80-4 LEP in FY 2017. CEPE is also institutionalizing best practices for analysis of alternatives and leads the corporate process to build the NNSA budget.

Conclusion

The NNSA performs vital activities at home and throughout the world in support of the nuclear security mission. Its success in addressing 21st century challenges hinges upon the technology, capabilities, and infrastructure entrusted to the organization.

Again, thank you for the opportunity to appear before you today.

Written Statement of Dr. Monica Regalbuto
Assistant Secretary for Environmental Management
United States Department of Energy
Before the
Subcommittee on Strategic Forces
Committee on Armed Services
United States Senate
February 23, 2016

Good afternoon Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee. I am pleased to be here today to represent the Department of Energy's (DOE) Office of Environmental Management (EM). I would like to provide you with an overview of the EM program, key accomplishments during the past year and what we plan to accomplish under the President's \$6,119,099,000 Fiscal Year (FY) 2017 budget request, which includes \$673,749,000 of proposed mandatory funding.

Overview of the EM Mission

EM supports the Department's Strategic Plan to position the DOE to meet the challenges of the 21st century and the Nation's Manhattan Project and Cold War legacy responsibilities. The Department will leverage past experience, applying best practices and lessons learned; identify, develop, and deploy practical technological solutions derived from scientific research; and look for innovative and sustainable practices that make cleanup more efficient.

The EM program was established in 1989 and is responsible for the cleanup of millions of gallons of liquid radioactive waste, thousands of tons of spent nuclear fuel and special nuclear material, disposition of large volumes of transuranic and mixed/low-level waste, huge quantities of contaminated soil and water, and deactivation and decommissioning of thousands of excess facilities. This environmental cleanup responsibility results from five decades of nuclear weapons development and production and Government-sponsored nuclear energy research and development. It involves some of the most dangerous materials known to mankind. EM has completed cleanup activities at 91 sites in 30 states; EM is responsible for the remaining cleanup at 16 sites in 11 states.

Since 1989, the EM footprint has reduced significantly. For example, the Fernald site in Ohio and the Rocky Flats site in Colorado, both of which once housed large industrial complexes, are now wildlife refuges that are also available for recreational use. At the Idaho National Laboratory, we have decommissioned and demolished more than two million square feet of excess facilities, and removed all EM special nuclear material (e.g., highly enriched uranium) from the state.

There is less than 300 square miles remaining to be cleaned up across the EM complex and progress continues. The remaining cleanup work presents some of the greatest challenges.

EM Cleanup Objectives and Priorities

EM's first priority is worker safety and at our sites across the complex we continue to pursue cleanup objectives with that in mind. Taking many variables into account, such as risk reduction and compliance agreements, EM has generally prioritized its cleanup activities as follows:

- Ensuring that activities are performed safely while providing the necessary security framework;
- Radioactive tank waste stabilization, treatment, and disposal;
- Spent nuclear fuel storage, receipt, and disposition;
- Special nuclear material consolidation, stabilization, and disposition;
- Transuranic and mixed/low-level waste disposition;
- Soil and groundwater remediation; and
- Excess facilities deactivation and decommissioning.

In particular, the FY 2017 budget request will allow EM to:

- Complete activities necessary for resumption of waste emplacement operations at the Waste Isolation Pilot Plant;
- Commence startup testing and commissioning activities at the Salt Waste Processing Facility to support initiation of radioactive operations in 2018; and
- Continue construction on the Waste Treatment and Immobilization Plant to support direct feed of low activity waste by end of 2022.

Most importantly, EM will continue to discharge its responsibilities by conducting cleanup within a "Safe Performance of Work" culture that integrates environmental, safety, and health requirements and controls into all work activities. This ensures protection for the workers, public, and the environment

Key Recent and Near-Term Accomplishments

I would like to take this opportunity to highlight a number of EM's most recent accomplishments. Recently, the 4,000th canister of radioactive glass was poured at the Savannah River Site Defense Waste Processing Facility. Achieving this milestone, along with other processing activities, enabled the closure of the seventh high-level waste storage tank at Savannah River with closure of the eighth tank in progress. At the Moab Site, half of the estimated 16 million tons of uranium mill tailings has been removed and shipped to an engineered disposal cell. At Hanford, we have completed cleanup of the bulk of the River Corridor cleanup, including more than 500 facilities and 1,000 remediation sites. At Oak Ridge, we are continuing design and critical decision reviews for the Outfall 200 Mercury Treatment Facility. The budget request enables EM to continue progress in completing buried waste exhumation at the Idaho site under the Accelerated Retrieval Project.

Highlights of the FY 2017 Budget Request

The FY 2017 budget request for EM includes \$5,382,050,000 for defense environmental cleanup activities. The request will allow EM to maintain a safe and secure posture across the complex, while maximizing our work on compliance activities. The budget request supports the continued construction of two unique and complex tank waste processing plants at the Savannah River Site, South Carolina, and the Office of River Protection, Washington. We are working to ensure these facilities will operate safely and efficiently. These two facilities are projected to treat tens of millions of gallons of radioactive tank waste for disposal.

Among EM's top priorities is the safe re-opening of the Waste Isolation Pilot Plant (WIPP) outside of Carlsbad, New Mexico. EM continues to support recovery from two 2014 incidents at the facility that interrupted the nationwide program for the disposition of transuranic waste resulting from atomic energy activities. Since opening WIPP, EM has sent more than 11,800 shipments of transuranic waste for permanent disposal, safely emplacing nearly 90,000 cubic meters of waste. The FY 2017 budget request will continue corrective actions and safety activities to support WIPP, regulatory and environmental compliance actions, the Central Characterization Project and transportation activities, and the resumption of waste emplacement operations by December 2016.

In FY 2017, cleanup progress will continue to be made across the rest of the complex. At Idaho, the FY 2017 request will support the Integrated Waste Treatment Unit. This facility is planned to treat approximately 900,000 gallons of sodium bearing tank waste. The request also continues exhumations at the Subsurface Disposal Area, treatment of legacy contact-handled and remote-handled transuranic and mixed low-level waste and safe, secure management of spent nuclear fuel.

At the Savannah River Site, the FY 2017 request supports continued production of canisters of vitrified high-level waste, and the construction of an additional on-site disposal unit for saltstone, the separated and treated low-activity fraction component of tank waste. Complete construction to support the planned commissioning and start-up of the Salt Waste Processing Facility in 2018. In addition, the request supports the safe and secure operation of the H Canyon/ HB-Line for the purpose of processing aluminum-clad spent nuclear fuel and down-blending EM-owned plutonium, ensuring the availability of space in K- and L-Areas for the future receipt of materials returned under national security summit agreements.

At the Office of River Protection, the FY 2017 request supports continuing construction of the Low-Activity Waste (LAW) Facility, Balance of Facilities, and outfitting of the Analytical Laboratory of the Waste Treatment and Immobilization Plant (WTP), facilities which are the centerpiece of the Department's plan to begin the direct feed of low activity to the LAW facility (DFLAW) as soon as end of 2022. It will also simultaneously support ongoing efforts to resolve the technical issues associated with the WTP Pretreatment Facility and the WTP High-Level Waste Facility. The FY 2017 request is designed to achieve the immobilization of low activity waste as soon as practicable while resolution of technical issues continues. In support of DFLAW, the request includes funds for engineering scale testing and final design of the Low Activity Waste Pretreatment System, which will remove cesium and solids from the tank waste and provide feed directly to the Low Activity Waste Facility.

Ongoing cleanup efforts continue at Richland. The FY 2017 request supports the completion of the Plutonium Finishing Plant Facility transition and certain disposition activities in order to achieve slab-on-grade and completion of a cap over the site. The FY 2017 request also supports continued remediation of the 618-10 Vertical Pipe Units and planning and technology maturation for the remediation of the 324 hot cell facility located over the 300-296 waste site.

At Oak Ridge, the FY 2017 request will maintain EM facilities in a safe, compliant, and secure manner; and support continuing design and critical decision reviews for the Outfall 200 Mercury Treatment Facility at the Y-12 National Security Complex. The processing of contact-handled and remote-handled transuranic waste debris will continue at the Transuranic Waste Processing Center while technology maturation and planning continues for the Sludge Processing Facility Buildout project. Additionally, the budget request supports continued direct disposition of Consolidated Edison Uranium Solidification Project material from Building 3019.

With the most challenging cleanup sites before EM, we understand the importance of technology development in reducing life cycle costs and enhancing our effectiveness. To help address many of the technical challenges involved with high-risk cleanup activities, the FY 2017 request reflects a total investment in technology development of \$33,000,000. The FY 2017 budget supports testing multiple technologies to solidify/stabilize mercury in soil and building materials to minimize the potential of mercury releases to the environment when decontamination and

decommissioning of excess facilities begins at the Oak Ridge site. EM will also invest in characterization of and treatment options for Technetium-99, a key radioactive constituent in tank waste and in soils at sites across the complex; in robotics and semi-autonomous systems required for remote access to nuclear, chemical and other high-hazard facilities that are inaccessible or restricted to human entry; and in the development of test beds for the demonstration of treatment technologies, innovative tooling, and other technical solutions.

Budget Authority and Planned Accomplishments by Site

Office of River Protection, Washington (Dollars in Thousands)

FY 2016 Enacted	FY 2017 Request
\$1,414,000	\$1,499,965

Key Accomplishments Planned for FY 2017

- Maintain scheduled construction activities for the Low Activity Waste Facility, Analytical Laboratory, and Balance of Facilities to support the Direct Feed Low Activity Waste approach
- Initiate single-shell tank retrievals in AX Tank Farm
- Complete retrieval of AY-102 double-shell tank
- Complete Low Activity Waste Pretreatment System (LAWPS) preliminary design to a design maturity of 90%
- Continue resolution of technical issues of Criticality; Hydrogen Gas Vessels; and Erosion/Corrosion at the Pretreatment Facility

Savannah River Site, South Carolina (Dollars in Thousands)

FY 2016 Current	FY 2017 Request
\$1,336,566	\$1,448,000

Key Accomplishments Planned for FY 2017

- Package 100 to 110 canisters of vitrified high-level waste at the Defense Waste Processing Facility
- Operate Actinide Removal Process and Modular Caustic Side Solvent Extraction Unit to process 1.7 million gallons of salt waste

- Support planned construction, commissioning, and start-up activities for the Salt Waste Processing Facility
- Complete construction of Saltstone Disposal Unit #6
- Continue to receive foreign research and domestic research reactor spent nuclear fuel for safe storage and disposition
- Disposition spent nuclear fuel in H-Canyon by processing
- Activities to support implementation plan activities for the Defense Nuclear Facilities Safety Board Recommendation 2012-1 to mitigate and remedy safety issues at 235-F

Carlsbad Field Office, New Mexico (Dollars in Thousands)

FY 2016 Enacted	FY 2017 Request
\$304,838	\$271,000

Key Accomplishments Planned for FY 2017

- Complete activities necessary for resumption of waste emplacement operations at the Waste Isolation Pilot Plant by December 2016
- Continue design and permitting actions for new ventilation shaft and on-site storage projects

Los Alamos National Laboratory, New Mexico (Dollars in Thousands)

FY 2016 Enacted	FY 2017 Request
\$185,000	\$189,000

Key Accomplishments Planned for FY 2017

- Address the nitrate salt bearing transuranic wastes
- Remediation of town site (TA-43) cleanup of solid waste management units from the 1940s and 1950s production sites
- Complete the investigation of hexavalent chromium contamination of the groundwater beneath Mortandad and Sandia Canyons including field and bench-scale testing and plume control interim measures

Idaho National Laboratory, Idaho (Dollars in Thousands)

FY 2016 Enacted	FY 2017 Request
\$396,000	\$362,088 ¹

Key Accomplishments Planned for FY 2017

- Continue treatment of sodium bearing waste in the Integrated Waste Treatment Unit
- Characterize, package, certify, and temporarily store exhumed waste on site pending the resumption of operations at and shipments to the Waste Isolation Pilot Plant
- Complete exhumation of targeted buried waste at the Accelerated Retrieval Project VIII facility
- Continue safe storage of spent (used) nuclear fuel

Oak Ridge Site, Tennessee (Dollars in Thousands)

FY 2016 Current	FY 2017 Request
\$250,878	\$213,219 ²

Key Accomplishments Planned for FY 2017

- Continue planning design and preparation of regulatory documentation and Critical Decision reviews for the Outfall 200 Mercury Treatment Facility
- Continue processing transuranic waste debris at the Transuranic Waste Processing Center
- Continue offsite disposition of select Oak Ridge waste stream

¹ The amount reflects Defense Environmental Cleanup portion, the total Idaho FY17 Request is \$370,088,000.

² The amount reflects Defense Environmental Cleanup portion, the total Oak Ridge FY17 Request is \$391,407,000.

Richland Operations Office, Washington (Dollars in Thousands)

FY 2016 Current	FY 2017 Request
\$988,091	\$797,760 ³

Key Accomplishments Planned for FY 2017

- Complete Plutonium Finishing Plant Facility transition and selected disposition activities pursuant to achieving slab-on-grade including completion of a cap over the site
- Begin project planning for dry storage options for the cesium and strontium capsules currently stored at the Waste Storage Encapsulation Facility
- Planning and technology maturity for the remediation of the highly radioactive waste site 300-296 located beneath the 324 Building
- Continue remediation of the 618-10 Vertical Pipe Units

Nevada National Security Site, Nevada (Dollars in Thousands)

FY 2016 Enacted	FY 2017 Request
\$62,385	\$62,176

Key Accomplishments Planned for FY 2017

- Complete closure activities for 9 soil corrective action sites
- Support safe disposal of approximately 34,000 cubic meters of low-level and mixed low-level radioactive waste

Conclusion

Mr. Chairman, Ranking Member Donnelly, and Members of the Subcommittee, I am honored to be here today representing the over 20,000 men and women that carry out our Office of Environmental Management mission. We are committed to achieving our mission and will continue to apply innovative environmental cleanup strategies to complete work safely, and efficiently, thereby demonstrating value to the American taxpayers. All of this work will, first and foremost, be done safely, within a framework of best business practices. I am pleased to answer any questions you may have.

³ The amount reflects Defense Environmental Cleanup portion, the total Richland FY17 Request is \$800,000,000.

Statement of Admiral James F. Caldwell
Deputy Administrator for Naval Reactors
National Nuclear Security Administration
U.S. Department of Energy
on the
Fiscal Year 2017 President's Budget Request
Before the
Senate Committee on Armed Services
Subcommittee on Strategic Forces

February 23, 2016

A strong Navy is crucial to the security of the United States. Navy warships are deployed around the world every hour of every day to provide a credible “forward presence.” With over 45 percent of the Navy’s major combatants being nuclear powered, including 10 aircraft carriers, 14 ballistic missile submarines, 55 attack submarines, and 4 guided missile submarines – it is vital that these ships are ready when and where our Nation needs them. In addition to supporting these nuclear powered combatants, Naval Reactors has also safely maintained and operated two nuclear powered land-based prototypes – both over 38 years old – to conduct research and development and two Moored Training Ships – both over 51 years old – the oldest operating pressurized water reactors (PWRs) in the world. These land-based prototypes, Moored Training Ships, and Naval Nuclear Power Training Command train over 3000 sailors per year to operate our naval nuclear propulsion plants.

Our ballistic missile submarine force remains on patrol, marking over 60 years of peacekeeping capability through strategic deterrence. The Navy had 34 submarine deployments and 26 strategic deterrent patrols during 2015. In addition, at any given time, there were always at least 56 of 71 submarines deployed or on stand-by to deploy within a few days. Our carriers, USS CARL VINSON (CVN 70) and USS THEODORE ROOSEVELT (CVN 71) completed successful deployments to the Central Command area of responsibility, and the USS RONALD REAGAN (CVN 76) turned over with the USS GEORGE WASHINGTON (CVN 73) to serve as the forward-deployed carrier in Japan.

This past year, we also saw the christening of the attack submarine PCU ILLINOIS (SSN 786) and keel laying for the PCU COLORADO (SSN 788) and PCU INDIANA (SSN 789), our fifteenth and sixteenth VIRGINIA-class submarines. We’ve also added another attack submarine to our force by commissioning USS JOHN WARNER (SSN 785), and began a program that delivers two VIRGINIA-class submarines annually. In 2015, we laid the keel for the second FORD-Class CVN, PCU JOHN F. KENNEDY (CVN 79). We currently have 12 submarines and one next generation aircraft carrier in various phases of construction at our shipyards. Initial reactor start-up was achieved in the lead reactor plant of PCU GERALD R. FORD (CVN 78), the first new design aircraft carrier propulsion plant in 40 years. This historic milestone represents the culmination of almost 20 years of dedicated and sustained effort by Naval Reactors and its field activities, our Department of Energy laboratories, nuclear industrial base suppliers, the Navy design team and the nuclear shipbuilders. This is the first step in fully

testing the integrated operations of the propulsion plant, culminating in sea trials this spring. Finally, we continued our reactor plant design and reactor core manufacturing development efforts to support of the new design OHIO-class Replacement reactor plant, including the life-of-ship core.

The firm support of this subcommittee last year enabled safe operation of the fleet, Naval Reactors mandatory oversight, and continued progress on key projects. Naval Reactors' budget request for Fiscal Year (FY) 2017 will continue this work. The funding request is for \$1.420 billion, an increase of \$45 million (3 percent) over the FY 2016 enacted funding level. In addition to supporting today's operational fleet, the requested funding will enable Naval Reactors to deliver tomorrow's fleet by funding three national priority projects and recruiting and retaining a highly skilled work force committed to the Navy and the nation. The projects are:

- Continuing to design the new reactor plant for the replacement of the OHIO-class ballistic missile submarine, which will feature a life-of-ship core and electric drive;
- Refueling a Research and Training Reactor in New York, to facilitate OHIO-class Replacement reactor development efforts and provide 20 more years of live reactor based training for the fleet operators; and
- Building a new spent fuel handling facility in Idaho that will facilitate long term, reliable processing and packaging of spent nuclear fuel from aircraft carriers and submarines.

Naval Reactors has requested funding in FY 2017 to support these projects, and to fund necessary reactor technology development, equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing a small but high-performing technical base, the teams at our four Program sites – the Bettis Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and our spent nuclear fuel facilities in Idaho – we can perform the research and development, analysis, engineering and testing needed to support today's fleet at sea and develop future nuclear-powered warships. Importantly, our labs perform the technical evaluations that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses that ensure nuclear safety and maximize operational flexibility. This technical base supports more than 15,000 nuclear-trained Navy sailors, who safely maintain and operate the 97 nuclear propulsion plants in the fleet 24 hours per day, 365 days per year around the globe. It will also facilitate delivery, as directed by Congress, of our conceptual plan for potential naval application of low enriched uranium.

The requested increase in funding is also required to support the planned ramp up of design efforts for the new reactor plant for the OHIO-class SSBN Replacement – the Navy's number one acquisition priority. Providing unparalleled stealth, endurance, and mobility, our ballistic missile submarine force has delivered more than 60 years of continuous at-sea deterrence, and continues to be the most survivable leg of the nuclear triad. OHIO-class Replacement SSBN activity this year includes reactor plant design and component development to support procurement of long lead components starting in FY 2019. Progress in these areas in FY 2017 maintains schedule alignment with the Navy as the program moves forward to construction start in FY 2021 while retiring technical risk and targeting cost reduction.

Related to OHIO-class Replacement and the Program's training needs, the FY 2017 budget request will support the land-based prototype refueling overhaul at the Kesselring Site in upstate New York. In FY 2017, Naval Reactors will continue the core manufacturing work needed for the refueling overhaul, which will also enable timely construction of the life-of-ship core for OHIO-class Replacement. Further, plant service-life engineering design will be completed in FY 2017 to ensure that the land-based prototype overhaul, performed concurrently with refueling, supports 20 additional years of research, development and training.

The Naval Reactors FY 2017 budget request also contains funds to continue the Spent Fuel Handling Recapitalization Project. After many years of funding reductions, Naval Reactors greatly appreciates Congressional support for this much needed project in FY 2016, where we received the full request of \$86M. Congressional support in 2016 enabled progress, design, and planning for site preparations and long lead material procurements in FY 2017. We will use the \$100M requested in FY 2017 to finalize key facility and equipment requirements and advance facility design to support establishing the Performance Baseline in FY 2018 and the start of construction in FY 2019. Continued Congressional support will help ensure that the facility in Idaho is ready to receive spent nuclear fuel from the fleet in FY 2025. Because the new facility's capabilities are required to support aircraft carrier refuelings and defuelings, any delay to the project schedule would require procurement of additional shipping containers to temporarily store naval spent nuclear fuel at a cost of approximately \$150M for each year the project is delayed.

At the requested funding level, Naval Reactors can safely maintain and oversee the nuclear-powered fleet. Naval Reactors can also continue to advance the OHIO-class Replacement and Land-based Prototype Refueling Overhaul, continue progress on the Spent Fuel Handling Recapitalization Project, and meet our environmental responsibilities.

Naval Reactors is committed to executing our projects on time and on budget, and continuing the search for the safest and most cost effective way to support the nuclear fleet. I respectfully urge your support for aligning funding allocations with the FY 2017 budget request.



Testimony

Before the Subcommittee on Strategic Forces, Committee on Armed Services, U.S. Senate

For Release on Delivery
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DEPARTMENT OF
ENERGY

Observations on Efforts by
NNSA and the Office of
Environmental
Management to Manage
and Oversee the Nuclear
Security Enterprise

Statement of David C. Trimble, Director
Natural Resources and Environment

GAO Highlights

Highlights of [GAO-16-422T](#), a testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, U.S. Senate

Why GAO Did This Study

DOE's NNSA is responsible for managing the nuclear weapon stockpile and supporting nuclear nonproliferation efforts. NNSA executes its missions at eight sites that make up the nuclear security enterprise. DOE's EM's mission includes decontaminating and decommissioning facilities that are contaminated from decades of nuclear weapons production and nuclear energy research.

DOE has made progress, but GAO continues to identify challenges across the nuclear security enterprise, including with major projects' cost and schedule delays. With NNSA and EM proposing to spend tens of billions of dollars to modernize the nuclear security enterprise, it is important to ensure that scarce resources are spent in an effective and efficient manner.

This testimony discusses DOE's (1) ongoing challenges in nuclear security modernization, (2) growing cost of environmental liabilities, and (3) nonproliferation accomplishments and long-term planning challenges. GAO's statement is based mainly on information from 11 prior GAO reports issued from February 2015 to February 2016, as well as on ongoing work on (1) DOE's plans to develop a high-level waste repository and (2) environmental liabilities. That work included reviewing agency documents and interviewing agency officials.

GAO is not making any new recommendations. DOE continues to act on the numerous recommendations GAO has made in these areas. GAO will continue to monitor DOE's implementation of these recommendations.

View [GAO-16-422T](#). For more information, contact David C. Trimble at (202) 512-3841 or trimbled@gao.gov

February 23, 2016

DEPARTMENT OF ENERGY

Observations on Efforts by NNSA and the Office of Environmental Management to Manage and Oversee the Nuclear Security Enterprise

What GAO Found

The Department of Energy's (DOE) National Nuclear Security Administration (NNSA)—a separately organized agency within DOE—continues to face several ongoing challenges in modernizing the nuclear security enterprise, including challenges in managing life extension programs (LEP), contracts and major projects, and the alignment of plans with future budgets. As GAO reported in August 2015, NNSA estimates that it will need more than \$290 billion over the next 25 years to support its modernization plans. These plans include the execution of seven LEPs that entail refurbishing or replacing nuclear weapons' aging components. In February 2016, GAO found some improved and positive management approaches were being used on the ongoing B61-12 LEP but also noted that the cost and schedule of the LEP have been subject to significant changes since its inception. Another challenge for DOE's modernization plans is effectively managing contracts and major projects to replace aging nuclear facilities. DOE has taken some actions to improve its contract and project management but continues to face cost and schedule delays, and this remains a high-risk area. Further, in May 2015, GAO found that NNSA did not have a comprehensive policy or procedures for implementing its framework for overseeing its contractors and for evaluating their performance. Moreover, NNSA's ability to execute its modernization plans is also complicated by questions regarding the alignment of its plans with future budgets and by outstanding and new needs for funding, such as supporting a new repository for defense high-level waste.

In 2015, DOE's Office of Environmental Management (EM) estimated that cleanup of former weapons production sites would generally take until 2075 and cost \$240 billion. In March 2015, GAO found that that this estimate does not include all costs—for example, the costs for some contaminated facilities that have not yet been transferred to EM, which DOE acknowledges could cost billions to clean up. GAO's preliminary observations from ongoing work also indicate that the estimated cost of the remaining environmental cleanup has been growing, even while EM has been spending billions on cleanup. For example, from fiscal years 2011 to 2015, EM spent a total of about \$23 billion, while EM's estimate of its remaining environmental liability rose by \$77 billion. Over the past 2 decades, GAO and others have pointed out the need for DOE to take a complex-wide, risk-based approach to its long-term cleanup strategy, which could reduce costs while also maximizing risk-reduction in a more timely way. For example, a 2015 review requested by EM found that DOE needed a more systematic effort to assess and rank risks within and among sites, to remedy the highest priority risks through the most efficient means.

NNSA implements nuclear nonproliferation programs worldwide. GAO found in September 2015 that NNSA had made progress in securing nuclear materials worldwide but that it missed some goals, such as for providing physical protection upgrades at buildings containing nuclear materials. In addition, NNSA began an initiative in 2010 to identify and assess future nuclear and radiological proliferation threats and related trends over the next 5 to 10 years. In an October 2015 report, GAO found limitations in the methods NNSA used in this initiative, such as not conducting its peer review consistent with established standards.

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee:

Thank you for the opportunity to discuss our recent work on some of the pressing ongoing management challenges that the Department of Energy's (DOE) National Nuclear Security Administration (NNSA)—a separately organized agency within DOE—and Office of Environmental Management (EM) continue to face.¹ NNSA is responsible for managing the nation's nuclear security missions: ensuring a safe, secure, and reliable nuclear deterrent; achieving designated reductions in the nuclear weapons stockpile; and supporting the nation's nuclear nonproliferation efforts. These missions are largely executed at eight sites that comprise the nuclear security enterprise. The sites include national laboratories, production plants, and a test site, which are owned by the U.S. government but managed and operated by contractors. According to NNSA documents, NNSA's funding to support its mission and related activities has increased from \$9.6 billion in fiscal year 2009 to \$11.4 billion in fiscal year 2015²—approximately 42 percent of DOE's total fiscal year 2015 budget. EM is responsible for decontaminating and decommissioning facilities and sites that are contaminated from decades of nuclear weapons production and nuclear energy research. EM currently has responsibilities at 16 sites across the United States. Since its inception in 1989, EM has spent over \$150 billion on cleanup efforts, including multiple activities to retrieve, characterize, treat, package, store, transport, and dispose of waste.

Since the end of the Cold War, key portions of the nuclear security enterprise's weapons production infrastructure have aged and become outdated, prompting congressional and executive branch decision makers to call on DOE to develop plans to modernize the infrastructure.³ The

¹NNSA was created under Title 32 of the National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106-65, § 3201 et seq.

²NNSA's budget did not increase in fiscal year 2013 compared with the previous year because of sequestration, which decreased NNSA's fiscal year 2013 budget by \$917 million.

³The end of the Cold War caused a dramatic shift in how the nation maintains nuclear weapons. Instead of designing, testing, and producing new nuclear weapons, the strategy shifted to maintaining the existing nuclear weapons stockpile indefinitely. Life extension programs increase, through refurbishment, the operational lives of weapons in the nuclear stockpile by 20 to 30 years and certify these weapons' military performance requirements without conducting underground nuclear testing.

Department of Defense's (DOD) 2010 Nuclear Posture Review identified long-term modernization goals and requirements, including sustaining a safe, secure, and effective nuclear arsenal through increasing investments to rebuild and modernize the nation's nuclear infrastructure, some of which dates back to the 1940s.⁴ In fiscal year 2011, the administration pledged over \$88 billion to NNSA over 10 years for operations and modernization, including the refurbishment of weapons in the current stockpile and the construction of facilities to support these refurbishments. In addition, the President's 2015 National Security Strategy states that the United States must invest the resources necessary to maintain a safe, secure, and effective nuclear deterrent as long as nuclear weapons exist.⁵

To meet modernization goals for the nuclear security enterprise, NNSA replaces or renovates research, development, and production facilities; refurbishes weapons in the stockpile to extend their operational lives; and performs simulations and laboratory experiments to ensure existing nuclear weapons remain safe and reliable. NNSA's Stockpile Stewardship and Management Plan, which is updated annually, provides information on modernization and operations plans and budget estimates over the next 25 years. The plan is NNSA's formal means for communicating to Congress the status of certain activities and its long-range plans and budget estimates for sustaining the stockpile and modernizing the nuclear security enterprise. The plan also discusses the current and projected composition and condition of the nuclear weapons stockpile.

NNSA is also involved in efforts to counter the proliferation of nuclear weapons. NNSA implements a range of nonproliferation programs under its Office of Defense Nuclear Nonproliferation (DNN). These programs include efforts to secure, consolidate, and dispose of weapons-usable nuclear materials and radiological sources;⁶ reduce the risks of nuclear

⁴Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: Apr. 6, 2010). The 2010 Nuclear Posture Review establishes the nation's nuclear weapons requirements and policy.

⁵The President is required to submit a national security strategy annually to Congress. 50 U.S.C. § 3043 (2015).

⁶Weapons-usable nuclear materials are highly enriched uranium, uranium-233, and any plutonium containing less than 80 percent of the isotope plutonium-238. Such materials are also often referred to as fissile materials or strategic special nuclear materials.

smuggling; enhance international export controls and International Atomic Energy Agency nuclear safeguards;⁷ and support research and development of new nonproliferation technologies.

As NNSA works to modernize the nuclear security enterprise, EM must address the legacy of 70 years of nuclear weapons production and energy research by the department and its predecessor agencies. These activities generated large amounts of radioactive waste, spent nuclear fuel, excess plutonium and uranium, and contaminated soil and groundwater. They also resulted in thousands of contaminated facilities, including land, buildings, and other structures and their systems and equipment.

NNSA and EM are also responsible for managing the design and construction of major projects (those with an estimated cost of \$750 million or more). Reports we have issued over the past several years,⁸ have highlighted various challenges that NNSA and EM face in carrying out their mission-related responsibilities, including challenges in contract and project management that relate to NNSA's modernization efforts. These challenges contribute to our continuing inclusion of NNSA's and EM's management of major contracts and projects on our list of agencies and program areas that are at high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement or that are most in need of

⁷The International Atomic Energy Agency is an independent international organization based in Vienna, Austria, that is affiliated with the United Nations and has the dual mission of promoting the peaceful uses of nuclear energy and verifying that nuclear material subject to safeguards is not diverted to weapons development efforts or other proscribed purposes. Safeguards allow the agency to independently verify that nuclear material and other specified items are not diverted by, among other things, inspecting all facilities and locations containing nuclear material declared by countries to verify its peaceful use.

⁸See for example GAO, *National Nuclear Security Administration: Observations on Management Challenges and Steps Taken to Address Them*, [GAO-15-532T](#) (Washington, D.C.: Apr. 15, 2015); *Department of Energy: Observations on DOE's Management Challenges and Steps Taken to Address Them*, [GAO-13-767T](#) (Washington, D.C.: July 24, 2013); *Modernizing the Nuclear Security Enterprise: Observations on DOE's and NNSA's Efforts to Enhance Oversight of Security, Safety, and Project and Contract Management*, [GAO-13-482T](#) (Washington, D.C.: Mar. 13, 2013); and *Modernizing the Nuclear Security Enterprise: Observations on the National Nuclear Security Administration's Oversight of Safety, Security, and Project Management*, [GAO-12-912T](#) (Washington, D.C.: Sept. 12, 2012). A list of recent GAO products assessing EM's and NNSA's management challenges is included at the end of this testimony.

transformation.⁹ In our 2015 high-risk update, we found that DOE continued to demonstrate a strong commitment and top leadership support to improve contract and project management in EM and NNSA—a key criterion for removing agencies and program areas from our high-risk list.¹⁰ However, we also found that the department had not made progress on the other four criteria for removal: organizational capacity, corrective action planning, monitoring effectiveness, and demonstrating progress. Our high-risk update also noted that NNSA and EM struggled to stay within cost and schedule estimates for most of their major projects.

My testimony today discusses (1) ongoing challenges facing DOE's nuclear security modernization efforts, (2) EM's growing cost of environmental liabilities, and (3) NNSA's nonproliferation accomplishments and long-term planning challenges. My statement is based mainly on information from 11 GAO reports issued from February 2015 to February 2016.¹¹ Also included are preliminary observations from

⁹In our 2013 high-risk update, to acknowledge progress DOE, including NNSA, has made in managing nonmajor projects (i.e., those costing less than \$750 million), we narrowed the focus of DOE's high-risk designation to major contracts and projects (i.e., those costing \$750 million or greater) but noted that we would continue to monitor nonmajor projects to ensure that progress in this area continues. See GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: Feb. 14, 2013).

¹⁰GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015).

¹¹GAO, *Nuclear Weapons: NNSA Has a New Approach to Managing the B61-12 Life Extension, but a Constrained Schedule and Other Risks Remain*, [GAO-16-218](#), (Washington, D.C.: Feb. 4, 2016); *Nuclear Weapons Sustainment: Improvements Made to Budget Estimates Report, but Opportunities Remain to Further Enhance Transparency*, [GAO-16-23](#) (Washington, D.C.: Dec. 10, 2015); *Nuclear Nonproliferation: NNSA's Threat Assessment Process Could Be Improved*, [GAO-16-118](#) (Washington, D.C.: Oct. 30, 2015); *Nuclear Nonproliferation: DOE Made Progress to Secure Vulnerable Nuclear Materials Worldwide, but Opportunities Exist to Improve Its Efforts*, [GAO-15-799](#) (Washington, D.C.: Sept. 23, 2015); *Modernizing the Nuclear Security Enterprise: NNSA Increased Its Budget Estimates, but Estimates for Key Stockpile and Infrastructure Programs Need Improvement*, [GAO-15-499](#) (Washington, D.C.: Aug. 6, 2015); *DOE Project Management: NNSA Should Ensure Equal Consideration of Alternatives for Lithium Production*, [GAO-15-525](#) (Washington, D.C.: July 13, 2015); *National Nuclear Security Administration: Actions Needed to Clarify Use of Contractor Assurance Systems for Oversight and Performance Evaluation*, [GAO-15-216](#) (Washington, D.C.: May 22, 2015); *Hanford Waste Treatment: DOE Needs to Evaluate Alternatives to Recently Proposed Projects and Address Technical and Management Challenges*, [GAO-15-354](#) (Washington, D.C.: May 7, 2015); [GAO-15-532T](#); *DOE Facilities: Better Prioritization and Lifecycle Cost Analysis Would Improve Disposition Planning*, [GAO-15-272](#) (Washington, D.C.: Mar. 19, 2015); and *Nuclear Waste: DOE Needs to Improve Cost Estimates for Transuranic Waste Projects at Los Alamos*, [GAO-15-182](#) (Washington, D.C.: Feb. 18, 2015).

our ongoing work on DOE's plans to develop a defense high-level waste repository and on nuclear waste environmental liabilities. Detailed information about the scope and methodology used to conduct our prior work can be found in each of our issued reports. We also updated information from our prior work when possible. For our ongoing work on DOE's plans to develop a high-level waste repository, we are reviewing agency documents and interviewing officials to describe DOE's analysis, and we are conducting content analyses using previous GAO reports and interviewing officials from DOE, the Nuclear Regulatory Commission, and other organizations about this approach. For our ongoing work on nuclear waste environmental liabilities, we are reviewing agency documents and interviewing agency officials to examine key elements of DOE's environmental liabilities estimate and factors contributing to growth of this estimate. In addition, we are reviewing agency documents, as well as our prior reports and those of others describing DOE's long-term waste cleanup strategy to describe how DOE prioritizes the human health and environmental risks. We are also reviewing DOE's audited financial statements for fiscal years 2011 to 2015. To assess the reliability of the data in those statements, we compared the environmental liability data in the financial statements to other published cost estimates for EM's cleanup program and interviewed officials in DOE's Office of the Chief Financial Officer and officials with the independent audit organization that annually audits DOE's financial statements. The work upon which this testimony is based was conducted or is being performed in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Ongoing Challenges Facing Nuclear Security Modernization Efforts

DOE faces several challenges in modernizing the nuclear security enterprise, including challenges in managing life extension programs (LEP), managing major projects, and budgetary challenges facing modernization efforts. NNSA's modernization plans call for undertaking seven LEPs and alterations¹² to refurbish or replace nuclear weapons' aging components for warheads and bombs over the next 25 years. Essential to the execution of these LEPs will be the timely completion of major projects on which they may depend, such as projects to replace aging facilities supporting their plutonium and uranium needs. These challenges are magnified by budgetary uncertainties related to the alignment of modernization plans with budget estimates and to outstanding and new needs for budgetary resources. Such needs include addressing deferred maintenance in facilities on which mission success depends, recapitalizing security infrastructure, and supporting a new repository for defense high-level waste, which will place additional demands on the defense budget.

Managing LEPs

Effective management of each planned LEP is essential to keep the modernization schedule on track.¹³ To ensure the continued safety, reliability, and performance of the aging nuclear stockpile, NNSA and DOD undertake LEPs and other efforts to refurbish or replace nuclear weapons' aging components. As we reported in August 2015, NNSA estimated that it will need more than \$290 billion over the next 25 years to support modernization of the nuclear security enterprise.¹⁴ Carrying out these LEPs is complex and difficult, and our past work has found that NNSA and DOD have had difficulty effectively managing these programs.

- In March 2009, we found that, in LEPs for the W76 warhead and legacy B61 bombs, NNSA and DOD established unrealistic schedules, did not establish consistent cost baselines, and did not

¹²A nuclear weapon alteration is a material change regarding assembly, maintenance, or storage that does not alter the weapon's operational capability.

¹³According to the fiscal year 2016 Stockpile Stewardship and Management Plan, NNSA is currently conducting four LEPs or other refurbishments (W76-1, B61-12, W88 alteration 370, W80-4). Over the next 25 years NNSA is planning three additional LEPs (IW-1, -2, -3).

¹⁴[GAO-15-499](#).

effectively manage technical risks.¹⁵ These problems resulted in delays, additional expenditures, difficulties tracking the cost of the W76 program, and a B61 refurbishment that did not meet all of NNSA's and DOD's technical objectives. NNSA agreed with our recommendation to, among other actions, develop and use consistent budget assumptions and criteria for the baseline to track costs over time, and the agency has taken steps toward improvement in this area, which we continue to monitor.

- In a May 2011 report on the B61 LEP, we found that NNSA and DOD had not prepared a long-term risk management plan to help avoid operational gaps and ensure that the United States would be able to maintain the capability to support its NATO commitments if the LEP were delayed or canceled.¹⁶ DOD and NNSA agreed with our recommendations to develop an operational risk management plan for the LEP, identifying the measures required to ensure that the United States is able to maintain its commitments to NATO with no gaps in operational capability. In September 2011, the Air Force, in coordination with NNSA, issued an initial plan for mitigating the risk of program delay, which the Air Force is currently updating.

More recently, in a February 2016 report, we reviewed the status of the B61-12 LEP.¹⁷ With thousands of individual components, the B61-12 LEP is the most complicated and expensive LEP undertaken since DOE initiated stockpile life extension activities in January 1996. Our report noted some improved and positive management approaches being used in the B61-12 LEP but also noted that the cost and schedule of the LEP have been subject to significant changes since the LEP's inception. Since May 2011, NNSA's and the Air Force's total cost estimate for the LEP increased from an initial estimate of about \$4 billion to about \$8.9 billion as of September 2015, and the first production date moved from 2017 to 2020. Much of the work under this LEP remains to be executed, with the largest share of program spending yet to come; as of September 2015, about \$1.6 billion had been spent on the LEP. We also found that, as the

¹⁵GAO, *Nuclear Weapons: NNSA and DOD Need to More Effectively Manage the Stockpile Life Extension Program*, [GAO-09-385](#) (Washington, D.C.: Mar. 2, 2009).

¹⁶GAO, *Nuclear Weapons: DOD and NNSA Need to Better Manage Scope of Future Refurbishments and Risks to Maintaining U.S. Commitments to NATO*, [GAO-11-387](#) (Washington, D.C.: May 2, 2011).

¹⁷[GAO-16-218](#).

B61-12 LEP moves forward, a significant challenge may be a constrained development and production schedule that the joint DOE and DOD Nuclear Weapons Council characterized as having “little, if any, margin left” to deal with potential program risks. We also found that factors constraining the schedule of the LEP include the aging of components in current versions of the B61, delays in starting the B61-12 LEP because of a lengthy design study, the effects of sequestration, and the need to complete the B61-12 LEP so that NNSA can begin other planned LEPs. We have previously made recommendations in this area and will continue to monitor these issues as we assess the LEP in its later stages.

Managing Contracts and Major Projects

Another significant challenge for DOE’s modernization plans for the nuclear security enterprise is effectively managing contracts including those for the design and construction of major projects that are intended to replace large components of the aging nuclear security infrastructure. Regarding contracts, about 90 percent of DOE’s budget is spent on contracts, and effective management of these contracts and associated contractors is essential for DOE to achieve its complex and challenging missions. In May 2015, we found that NNSA had not fully established policies or guidance for using information from contractor assurance systems to conduct oversight of management and operations contractors. These systems are designed by contractors to assure their own performance and can be leveraged by NNSA for oversight purposes and thereby improve efficiency.¹⁸ In the absence of a headquarters policy, we found that NNSA field offices had established their own procedures, but these procedures were not always complete and differed among field offices. We also found that NNSA had discontinued a process for validating oversight approaches without replacing it with another approach. In addition, we found that NNSA had not determined if it had sufficient qualified staff to implement its framework for using information from the contractor assurance systems. We recommended, among other things, that NNSA develop guidance on using information from contractor assurance systems to oversee and evaluate management and operations contractors, and study staffing needs. In NNSA’s response to our report, the agency agreed with our recommendations and outlined planned actions to address these recommendations, as well as timelines for completion.

¹⁸[GAO-15-216](#).

Regarding major projects, our past reports have found that NNSA has struggled to manage these projects within their initial cost and schedule estimates.¹⁹ In April 2015, we reported to this subcommittee that DOE had taken a number of actions to address its contract and project management challenges in NNSA and EM.²⁰ The most recent actions have included the issuance of memorandums from the Secretary of Energy in December 2014 and June 2015. These memorandums put into effect several important recommendations to improve contract and project management made in a report by the Contract and Project Management Working Group that was established by the Secretary in 2013.²¹ The December 2014 memorandum directed that several recommendations made by the Working Group be implemented immediately, including that program offices conduct analyses of project alternatives independent of the contractor responsible for the proposed project. The memo also established a project management risk committee to provide department-wide project management risk assessment and expert advice on projects with a cost of \$100 million or greater. The June 2015 memorandum implemented several more recommendations from the working group. For example, it directed program offices to develop project cost and schedule estimates consistent with methods and best practices identified in GAO's Cost and Schedule Guides, and to conduct analyses of the root causes underlying project cost overruns, schedule delays, and performance shortcomings.

We support the actions taken by the Secretary, but as reported in our 2015 high-risk update, we remain concerned that the department still may not truly understand the underlying causes of its contract and project management problems. As we testified in April 2015, the recommendations made in the Working Group report and the actions

¹⁹In addition, although we removed nonmajor projects from our high-risk list in 2013, we continue to monitor these projects to ensure that progress in this area continues and is sustained. We recently evaluated progress with the Lithium Production Facility at NNSA's Y-12 complex and the Transuranic Waste Facility at NNSA's Los Alamos National Laboratories. See [GAO-15-525](#) and [GAO-15-182](#).

²⁰[GAO-15-532T](#).

²¹U.S. Department of Energy, *Improving Project Management: Report of the Contract and Project Management Working Group* (Washington, D.C.: November 2014). The working group is chaired by a senior advisor to the Secretary and includes a group of senior project management leaders, including from NNSA and EM. The purpose of the working group is to improve project management execution.

taken by DOE in response to these recommendations represent the third such cycle since 2008, and the recommendations include some issues that the department had declared it previously mitigated, such as difficulties with front-end planning and project funding.²²

Our recent work indicates that implementation of and adherence to departmental requirements is essential if the department's most recent corrective actions are to succeed, as shown in the examples below:

- In July 2015, we found that NNSA had not followed established departmental policy that requires analyzing a mission need independent of a particular solution.²³ Specifically we found that, when considering how it might replace an aging lithium production facility, NNSA included a description of alternatives for addressing its mission need, such as building a new facility or outsourcing lithium processing, but that it also expressed a preference for a particular solution—specifically, a new facility. We concluded that by having completed a mission need statement that is not fully independent of a particular solution and having prepared cost and schedule estimate ranges for only one of the seven alternatives, NNSA could potentially undermine its ability to choose the best alternative that satisfies the mission need. We recommended that NNSA objectively consider all alternatives, without preference for a particular solution, as it proceeds with its analysis of alternatives process. NNSA neither agreed nor disagreed with our recommendation; however, it disagreed with our conclusion. We continue to believe our conclusion is fair and well supported.
- In February 2015, we found that the cost estimates associated with NNSA's Transuranic Waste Facility only partially followed best practices.²⁴ Among other things, we found that NNSA did not follow best practices in developing the cost estimate for the facility's operations and maintenance costs because, among other things, the agency did not sufficiently document its approach for developing the

²²GAO-15-532T.

²³GAO-15-525.

²⁴GAO-15-182. The term transuranic means those elements with an atomic number greater than that of uranium. Transuranic waste generally includes radioactive waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years.

estimate and did not use an inflation rate in its calculations. We recommended that NNSA update the facility's cost estimate to allow better management of the project's life-cycle costs going forward. DOE generally agreed with our recommendations.

In addition, certain major projects that we have examined in past and ongoing work continue to experience cost and schedule delays. For example:

- NNSA proposed in its fiscal year 2017 congressional budget request to terminate its Mixed Oxide (MOX) Fuel Fabrication Facility,²⁵ which has been under construction since 2007, and for which NNSA has already spent approximately \$4.6 billion on design and construction. NNSA's request stated that its MOX fuel approach to dispose of 34 tons of weapons-grade plutonium will be significantly more expensive than anticipated and will require approximately \$800 million to \$1 billion annually for decades. Instead, NNSA proposes to focus on a new alternative to dilute and dispose of the surplus plutonium and dispose of the material in a geologic repository. According to DOE officials, they are currently conducting pre-conceptual design work for this dilute and dispose option, evaluating whether a portion or all of this material could be disposed of in DOE's geologic repository, the Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico; and examining alternative options for disposal. We have ongoing work examining the extent to which WIPP has the capacity to dispose of this quantity of plutonium.
- EM does not have updated information on the cost and schedule delays for key portions of the Waste Treatment and Immobilization Plant (WTP) at Hanford, Washington. This is the largest construction project at DOE, and it continues to face delays and cost increases. In May 2015, we noted that in 2006,²⁶ EM increased the project cost baseline to \$12.3 billion and extended completion to 2019. We also reported that this project will not meet its cost and schedule baselines. In addition, we found that DOE is limited in its ability to measure cost and schedule performance. In January 2016, DOE stated that it would not be able to develop new cost and schedule baselines for at least 3

²⁵The facility was to produce MOX fuel (i.e., a mix of plutonium and uranium oxides) for nuclear reactors.

²⁶[GAO-15-354](#).

years for key portions of the WTP. In May 2015, we found that DOE's costs for the WTP will likely increase by billions.²⁷ DOE also proposed adding 17 years to the completion date in its proposal to modify the consent decree in its dispute with the state of Washington.²⁸

We have ongoing work to evaluate DOE's contract and project management practices. Specifically, we have ongoing reviews examining major projects including the WTP, as well as the Chemistry and Metallurgy Research Replacement project at NNSA's Los Alamos National Laboratories in New Mexico, and the Uranium Processing Facility at NNSA's Y-12 complex in Oak Ridge, Tennessee. In addition, we have ongoing reviews examining DOE's use of management and operating contracts, and NNSA's qualifications for program managers.

Budgetary Challenges Facing Modernization Efforts

NNSA's ability to execute its modernization plans is also complicated by questions about the alignment of its plans with future budgets and competing demands for budgetary funding. Our work has identified instances where NNSA's long-term budget estimates to support its modernization plans and the President's budget request were not in alignment. We have also identified outstanding and new demands for resources, such as the need to address deferred maintenance in facilities on which mission success depend; to recapitalize security infrastructure; and to support a new repository for defense high-level waste, which may place additional demands on the defense budget.

²⁷As we reported in May 2015, on September 30, 2014, the WTP contractor submitted a contract modification proposal to DOE's Office of River Protection that includes revised cost estimates to complete portions of the WTP. According to the proposal, the cost for this work is about \$3.7 billion, including the contractor's fee, which is in addition to the \$151 million to \$2 billion the contractor estimated it may need to address risks facing the Low Activity Waste facility. This proposal does not include the costs for the Pretreatment and High-level Waste facilities, on which construction has been stalled for several years. According to DOE headquarters officials, these costs are estimates developed by the contractor that have not been validated or accepted by DOE.

²⁸On October 25, 2010, a federal district court approved a consent decree as part of the settlement of a lawsuit that the state filed against DOE. This consent decree imposed an enforceable schedule for cleaning up waste from Hanford's underground tanks. DOE agreed in this consent decree to achieve "initial plant operations" of the WTP no later than December 31, 2022. *Washington v. Chu*, Civ. No. 08-05085 (E.D. Wash), entered October 25, 2010. DOE has proposed in court to change that deadline to December 31, 2039.

Budgetary Alignment with Program Plans

In a December 2015 report,²⁹ we assessed budget estimates for sustaining and modernizing the nuclear stockpile and nuclear security enterprise over the next 10 years that were contained in a joint DOD-DOE report.³⁰ We found that DOE's overall budget estimates for fiscal years 2021 through 2025—the 5 years beyond the Future-Years Nuclear Security Program (NNSA's 5-year funding plan)—totaled \$56.4 billion, \$4.2 billion more than the estimates identified in the joint report as the President's budget figures. This apparent nonalignment between these estimates has raised questions about the alignment of NNSA's modernization funding needs based on program plans with potential future budgets.

In our August 2015 and December 2015 reports, we also found some nonalignment over a 10-year period (fiscal years 2016 to 2025) between the program cost estimates and budget estimates for a number of LEPs.³¹ We concluded in both reports that this misalignment, if left uncorrected, could result in a potential funding shortfall for those programs in some years. NNSA agreed with our recommendation from August 2015 to be more transparent about differences between program and budget cost estimates and noted that it would include such information in its fiscal year 2017 planning documents. We have ongoing work on this issue.

Outstanding and New Demands for Budgetary Resources

Our work has found that outstanding and new needs for budgetary resources—such as the outstanding needs to address deferred maintenance and recapitalize security infrastructure as well as the new need to support a separate repository for defense high-level waste—may place additional demands on the defense budget. As we found in August 2015, NNSA's infrastructure budget estimates are not adequate to address the agency's reported \$3.6 billion deferred maintenance backlog, and the backlog will continue to grow.³² We found that one reason the

²⁹[GAO-16-23](#).

³⁰These estimates were included in the fiscal year 2016 DOD-DOE joint report. DOD and DOE are required to submit to certain congressional committees a report—referred to as the “section 1043” report or the “DOD-DOE joint report”—on among other things, the plan for the nuclear weapons stockpile and its delivery systems and 10-year budget estimates for modernization.

³¹[GAO-15-499](#) and [GAO-16-23](#). Our reviews examined the following LEPs: W76-1, the B61-12, the W88 Alteration 370, the W80-4, the Interoperable Warhead-1, and the Interoperable Warhead-2.

³²[GAO-15-499](#).

backlog will continue to grow is that the 2015 budget estimates to address the problem fell below DOE infrastructure investment benchmarks for maintaining and recapitalizing existing facilities. We reported that NNSA is investing in systems and processes to improve data available for program planning and budget estimating to address deferred maintenance and that NNSA expects improved estimates to contribute to the President's budget request in fiscal year 2017. In addition to a large backlog of deferred maintenance, NNSA faces other infrastructure challenges that are not included in NNSA's long-range plans. For instance, NNSA's fiscal year 2017 budget request notes that more than \$2 billion may be needed over a 15-year period to address aging and obsolete security infrastructure.³³ Congress directed the creation of a Security Improvements Program to address the backlog of needed security infrastructure upgrades, and provided \$30 million in fiscal year 2016 to begin that process. According to NNSA's fiscal year 2017 budget request, NNSA will use the fiscal year 2016 funding to meet immediate requirements, while developing a funding plan and list of prioritized upgrade projects to address security infrastructure and Perimeter Intrusion Detection and Assessment System upgrades in future years.

Further, a recent policy change may place additional demands on the defense budget. In March 2015, DOE released a report supporting the need for a separate defense high-level radioactive waste repository, which would hold waste from atomic energy defense activities. In addition to this repository, defense spent nuclear fuel along with commercial spent nuclear fuel would be placed in separate comingled repository. Until 2010, DOE had been proceeding with a plan to use a single repository at Yucca Mountain, Nevada, that comingled defense and commercial waste. We have ongoing work examining what is known about the projected cost and schedule of DOE's new plan. According to DOE's analysis, developing two repositories is generally more expensive than one. According to DOE, the upper end of DOE's cost estimate range for the two repository option is \$33 billion higher than the upper end of their cost estimate range for a single comingled repository option.³⁴ Further, DOE

³³DOE, *Department of Energy: FY 2017 Congressional Budget Request for the National Nuclear Security Administration*, vol. 1 (Washington, D.C.: Feb. 2016).

³⁴DOE's analysis from the March 2015 plan shows the cost of a two-repository option as being \$38 billion to \$129 billion, while the cost of a single comingled repository option is shown as \$29 billion to \$96 billion.

documents indicate that these estimates do not include the full cost of the program. For example, the estimates do not include the cost of packaging and transporting the waste. DOE's previous cost estimate for packaging and transportation at Yucca Mountain exceeded \$20 billion. According to DOE officials, these costs may be offset to some degree by future benefits, such as efficiencies in site selection that could shorten the amount of time it takes the department to choose a site for the comingled repository, but such benefits cannot be quantified at this time. Our preliminary observations show that the additional costs for a two-repository approach could place additional demands on future defense budgets. Under DOE's new plan for two repositories, defense appropriations are to cover the entire cost of the defense high-level radioactive waste repository. In addition, according to DOE documents, the defense appropriation share for a comingled repository could be up to 20 percent of its cost, but according to DOE officials the share will likely be lower than 20 percent.

Growing Costs of Environmental Liabilities

EM is responsible for the large and complex mission of cleaning up the nuclear security complex, and the cost of addressing this environmental liability is significant. Based on our preliminary observations from ongoing work, of the total environmental liability held by the federal government, DOE is responsible for the majority, or \$340 billion.³⁵ Of this amount, EM's cleanup of former weapons production sites is by far the largest piece. In 2015, EM estimated that cleanup of former weapons production and nuclear energy research sites would generally take until 2075 and could cost as much as \$240 billion (in current dollars).³⁶ Some of our recent work indicates that this \$240 billion figure is likely understated, in part because there are additional future cleanup costs in other portions of DOE liabilities that will likely shift to EM. For example, we found in March 2015 that EM's portion of the environmental liability estimate does not include the cost to clean up NNSA's excess facilities that have not yet been transferred to EM, which DOE acknowledges could cost billions.³⁷

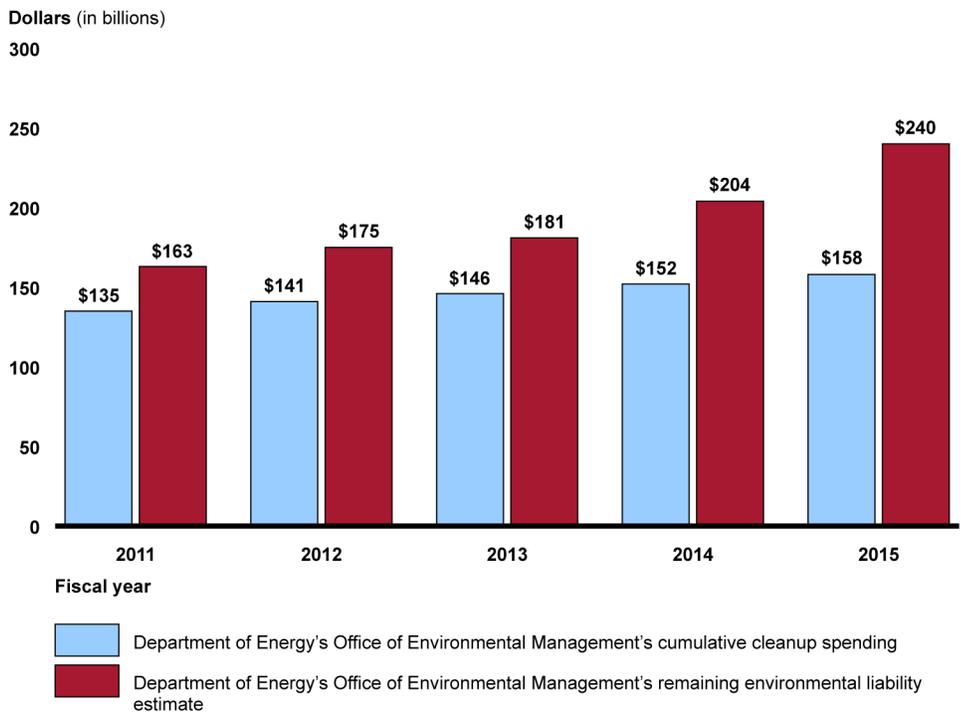
³⁵As of this testimony, the most current federal government environmental liability estimate of \$370 billion was for 2014.

³⁶DOE, *FY 2016 Congressional Budget Request*, DOE/CF-0111 (Washington, D.C.: Feb. 2015). DOE, *Fiscal Year 2015: Agency Financial Report*, DOE/CF-0144 (Washington, D.C.: Nov. 16, 2015).

³⁷[GAO-15-272](#).

Our preliminary observations based on our ongoing work indicate that the remaining environmental cleanup estimate has been growing since fiscal year 2011, even as EM has continued to spend money on cleanup work. For example, our preliminary analysis of EM audited financial statements indicates that EM spent \$23 billion from fiscal years 2011 through 2015—with the cumulative total spent by EM rising from \$135 billion to \$158 billion—for environmental cleanup work at its EM sites (see fig. 1). During this same time, EM’s estimate to complete the cleanup work (remaining environmental liability estimate) rose by \$77 billion—from \$163 billion to \$240 billion. In its fiscal year 2015 financial statement, DOE attributes recent increases to (1) inflation adjustments to reflect constant dollars for the current year; (2) improved and updated estimates for the same scope of work, including changes resulting from deferral or acceleration of work; (3) revisions in technical approach or scope; and (4) regulatory changes.

Figure 1: DOE’s Office of Environmental Management’s Cumulative Spending on Cleanup and Remaining Environmental Liability Estimates from Fiscal Years 2011 to 2015



Source: GAO analysis of Department of Energy financial statement data. | GAO-16-422T

Over the past 2 decades, we and others have pointed out the need for DOE to take a complex-wide, risk-based approach to its long-term cleanup strategy, which could reduce costs while also maximizing risk-reduction in a more timely way. For example, in 1995, we reported that DOE's cleanup strategy had been shaped by site-specific environmental agreements whose priorities and requirements had not always been consistent with technical or fiscal realities and that, under budgetary constraints, the use of many separately negotiated agreements was not well suited to setting priorities among sites and may result in the selection of cleanup approaches that are costlier than needed to address risks.³⁸ Most recently, in 2015, a review by the Omnibus Risk Review Committee found that DOE needed a more systematic effort to assess and rank risks within and among sites, including through headquarters guidance to sites, and to allocate federal taxpayer monies to remedy the highest-priority risks through the most efficient means to help secure more effective use of available resources and greater overall protection.³⁹ The report noted that DOE has not achieved the best risk-reducing use of available resources. According to the report, inconsistent regulatory approaches across cleanup sites, selection of cleanup remedies that are not tailored to risks, and certain requirements in federal facility agreements and consent decrees cause disproportionate resources to be directed at lower-priority risks.

We have ongoing work looking at (1) DOE's long-term cleanup strategy, (2) what is known about the potential cost and time frames to address DOE's environmental liabilities, (3) what factors DOE considers when prioritizing cleanup activities across its sites, and (4) how DOE's long-term cleanup strategy addresses the various risks that long-term cleanup activities encounter.

³⁸GAO, *Department of Energy: National Priorities Needed for Meeting Environmental Agreements*, [GAO/RCED-95-1](#) (Washington, D.C.: Mar. 3, 1995).

³⁹Omnibus Risk Review Committee, *A Review of the Use of Risk-Informed Management in the Cleanup Program for Former Defense Nuclear Sites* (Washington, D.C.: August 2015). EM requested the Consortium for Risk Evaluation with Stakeholder Participation, an independent multidisciplinary consortium of universities led by Vanderbilt University, to organize a review in response to congressional direction accompanying the Consolidated Appropriations Act, 2014. To carry out the reviews, the consortium constituted a committee of eight nationally distinguished individuals with diverse experience in risk analysis; public health and safety; nuclear safety; risk management; and environmental law, regulation, and public policy.

Nonproliferation Accomplishments and Long-Term Planning Challenges

We have found that NNSA has made progress securing nuclear materials around the world but that it faces challenges in meeting some future nuclear security goals. In addition, we have found limitations in some of NNSA's long-term planning efforts for DNN programs, particularly in its effort to assess proliferation threats and trends over the next 5 to 10 years and their implications for the future of DNN programs.

In September 2015, we reported that NNSA had made progress in securing nuclear materials around the world, particularly in achieving goals under the President's 2009 initiative to secure all vulnerable nuclear materials within 4 years.⁴⁰ Specifically, we found that from April 2009 through December 2013, NNSA exceeded its goal for removing or disposing of highly enriched uranium (HEU) or plutonium, and it exceeded its goal of downblending HEU.⁴¹ However, we found that NNSA missed its goals for other activities under the initiative, including for providing physical protection upgrades at buildings containing nuclear materials and for converting foreign reactors to use more proliferation-resistant low-enriched uranium. In addition, we identified several challenges that may hamper NNSA's ability to meet future nuclear material security goals. For instance, we found that NNSA had neither completed a prioritization list of nuclear materials, including recently identified HEU of U.S.-origin, for return to the United States or disposition, nor established a time frame for doing so. We also found that NNSA and other agencies had not visited key foreign sites to determine whether the U.S.-origin nuclear material on-site was protected according to international physical security guidelines. We recommended that NNSA complete its prioritization of nuclear materials at foreign locations and that NNSA and other agencies visit sites containing key quantities of U.S nuclear materials that have not been visited in at least 5 years. NNSA agreed with our recommendations and reported to us in December 2015 that it had completed a revised list, prioritizing the removal or disposition of civilian nuclear material inventories.

⁴⁰ [GAO-15-799](#).

⁴¹ HEU is uranium enriched in the isotope uranium-235 to 20 percent or greater. Downblending is a process that involves mixing HEU with either depleted or natural uranium, or low-enriched uranium, to produce a new product that has a lower concentration of uranium-235.

We have also reported on other limitations related to NNSA's long-term nonproliferation planning. Notably, in response to the changing nonproliferation environment, NNSA began an initiative in 2010, known as the "Over the Horizon" (OTH) initiative, to identify and assess future nuclear and radiological proliferation threats and related trends over the next 5 to 10 years—beyond NNSA's 5-year budget planning horizon—and to consider the implications for the future of DNN programs. The establishment of the OTH initiative was intended to institutionalize long-term DNN planning, and the information produced by the initiative would, among other things, support DNN program planning and organization decisions.

In an October 2015 report, we found that NNSA used a variety of established methods in its OTH initiative to assess potential proliferation threats, but the implementation of these methods had several limitations.⁴² For example, NNSA officials used the established method of subjecting OTH results to peer review. However, we found that the peer review was not conducted in a way consistent with established standards, for instance, by documenting the results of the peer review. The limitations we identified raised concerns about the quality of the analyses produced and about the usefulness of the OTH initiative, as it had been implemented so far, as a DNN planning tool. Additionally, it was unclear how information generated by the OTH initiative informed recent organizational changes and planning decisions in the DNN office. For instance, we found that the extent to which the OTH initiative informed the January 2015 DNN reorganization, which consolidated five DNN program offices into four offices, was unclear because NNSA officials could not provide documentation or examples of links between OTH findings and elements of the reorganization. In addition, we found that it was unclear how the OTH initiative informed the development of a March 2015 strategic plan for NNSA's programs—including DNN programs—to prevent, counter, and respond to future nuclear proliferation and terrorism threats because of conflicting information about the role of the initiative in the plan's development. We did not make recommendations on these matters because NNSA officials told us that a new strategic planning function was being created that will oversee the OTH process and manage integration of OTH and other long-range studies into future

⁴²[GAO-16-118](#).

versions of the NNSA strategic plan. We will continue to monitor NNSA's actions in this area.

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff members have any questions about this testimony, please contact me at (202) 512-3841 or trimbled@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are Nathan Anderson, Dan Feehan, Jonathan Gill, and William Hoehn (Assistant Directors); David Bennett; Mark Braza; Antoinette Capaccio; Lee Carroll; Rob Grace; Bridget Grimes; Cristian Ion; Richard Johnson; Nancy Kintner-Meyer, Jeff Larson; Cynthia Norris; Chris Pacheco; Leslie Pollock; Dan Royer; Robert Sanchez; and Kiki Theodoropoulos.

Appendix: Selected GAO Products

The following is a selection of GAO's recent work assessing the National Nuclear Security Administration's and the Office of Environmental Management's management efforts:

Nuclear Weapons: NNSA Has a New Approach to Managing the B61-12 Life Extension, but a Constrained Schedule and Other Risks Remain. [GAO-16-218](#). Washington, D.C.: Feb. 4, 2016.

Nuclear Weapons Sustainment: Improvements Made to Budget Estimates Report, but Opportunities Remain to Further Enhance Transparency. [GAO-16-23](#). Washington, D.C.: Dec. 10, 2015.

Nuclear Nonproliferation: NNSA's Threat Assessment Process Could Be Improved. [GAO-16-118](#). Washington, D.C.: Oct. 30, 2015.

Nuclear Nonproliferation: DOE Made Progress to Secure Vulnerable Nuclear Materials Worldwide, but Opportunities Exist to Improve Its Efforts. [GAO-15-799](#). Washington, D.C.: Sept. 23, 2015.

Modernizing the Nuclear Security Enterprise: NNSA Increased Its Budget Estimates, but Estimates for Key Stockpile and Infrastructure Programs Need Improvement. [GAO-15-499](#). Washington, D.C.: Aug. 6, 2015.

DOE Project Management: NNSA Should Ensure Equal Consideration of Alternatives for Lithium Production. [GAO-15-525](#). Washington, D.C.: July 13, 2015.

National Nuclear Security Administration: Actions Needed to Clarify Use of Contractor Assurance Systems for Oversight and Performance Evaluation. [GAO-15-216](#). Washington, D.C.: May 22, 2015.

Hanford Waste Treatment: DOE Needs to Evaluate Alternatives to Recently Proposed Projects and Address Technical and Management Challenges. [GAO-15-354](#). Washington, D.C.: May 7, 2015.

National Nuclear Security Administration: Observations on Management Challenges and Steps Taken to Address Them. [GAO-15-532T](#). Washington, D.C.: April 15, 2015.

DOE Facilities: Better Prioritization and Lifecycle Cost Analysis Would Improve Disposition Planning. [GAO-15-272](#). Washington, D.C.: Mar. 19, 2015.

Nuclear Waste: DOE Needs to Improve Cost Estimates for Transuranic Waste Projects at Los Alamos. [GAO-15-182](#). Washington, D.C.: Feb. 18, 2015.

High-Risk Series: An Update. [GAO-15-290](#). Washington, D.C.: Feb. 11, 2015.

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