



June 14, 2017

# Review of the FY2018 Budget Request for the National Nuclear Security Administration

Subcommittee on Energy and Water Development, Committee on  
Appropriations, United States Senate, One Hundred Fifteenth Congress,  
First Session

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Deputy Administrator for Naval Reactors

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U.S. Department of Energy

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**Chairman Lamar Alexander Opening Statement  
Committee on Appropriations Subcommittee on Energy and Water Development**

**Hearing to Review the Fiscal Year 2018 Budget  
for the National Nuclear Security Administration**

**June 14, 2017**

*(As prepared for delivery)*

First, I would like to thank our witnesses for being here today, and also Senator Feinstein, with whom I have the pleasure to work with again this year to draft the Energy and Water Appropriations bill.

I am very pleased with the fiscal year 2017 Energy and Water Appropriations bill, which provided a record level of funding for the Office of Science and the Corps of Engineers, continued to support supercomputing, maintained the nation's nuclear weapons stockpile, and cutting wasteful spending. I look forward to working with Senator Feinstein on another strong bill this year.

Our witnesses today include:

Lieutenant General Frank Klotz, the Administrator of the National Nuclear Security Administration (NNSA);

Mr. Phil Calbos, Acting Deputy Administrator for Defense Programs;

Mr. David Huizenga, Acting Deputy Administrator for Defense Nuclear Nonproliferation; and

Admiral Frank Caldwell, Deputy Administrator for Naval Reactors.

We're here today to review the administration's fiscal year 2018 budget request for the National Nuclear Security Administration (NNSA), the semi-autonomous agency within the Department of Energy that is responsible for a vital mission—maintaining our nuclear weapons stockpile, reducing the global dangers posed by weapons of mass destruction, and providing the Navy with safe and effective nuclear power.

The president's fiscal year 2018 budget request for the NNSA is \$13.9 billion, an increase of \$993 million (7.7 percent) over the fiscal year 2017 enacted level.

Today, I'd like to focus my remarks and questions on three main areas:

- 1) Keeping critical projects on time and on budget;
- 2) Effectively maintaining our nuclear weapons stockpile; and
- 3) Supporting our nuclear Navy.

## **Keeping Critical Projects on Time and on Budget**

The NNSA is responsible for three of the largest construction projects in the federal government:

- 1) the Uranium Processing Facility in Tennessee;
- 2) the MOX Fuel Fabrication Facility in South Carolina; and
- 3) the Plutonium Facility in New Mexico.

Combined, these projects could cost more than \$20 billion dollars to build, and that doesn't include the costs to operate the facilities. Over the past five years, Senator Feinstein and I have worked hard to keep costs from skyrocketing. We want to make sure hard-earned taxpayer dollars are spent wisely and that these projects are on time and on budget.

Senator Feinstein and I have focused much of our oversight on the Uranium Processing Facility in Tennessee over the past five years. That oversight includes regular meetings with the Department's leadership to discuss the project—particularly how the Department is implementing the recommendations of a Red Team review, completed in 2014, that detailed ways to get the project on track.

Senator Feinstein and I requested that 2014 Red Team review, which was headed by Dr. Thom Mason, the Director of the Oak Ridge National Laboratory. The Red Team recommended ways to get the project back on time and on budget. General Klotz has previously told us that all of the Red Team's recommendations are being followed, and I think that is a big part of the reason that project is moving along nicely.

We have said the project needs to be completed by 2025 at a cost of no more than \$6.5 billion, and the design of the nuclear facilities needs to be 90% before construction of those buildings begins.

I recently visited Y-12 with Secretary Perry, and saw the work being done to build the new Uranium Processing Facility. I understand the designs for the two nuclear buildings will be more than 90% completed by the end of the year, and ready to start construction next year.

The MOX Fuel Fabrication Facility, a major construction project in South Carolina, has also raised several concerns because of growing costs. Senator Feinstein and I asked for a Red Team review of the MOX project in 2015 to get the project back on track.

The Red Team concluded that the MOX project would cost about twice as much each year as an alternative, known as the Dilute and Disposal Alternative. The cost to build the MOX facility is over \$17 billion. Once the MOX facility is built, the cost of the MOX option would be \$800 million to \$1 billion per year. The Dilute and Disposal option will require up to \$500 million to build the processing lines and will cost less than \$400 million per year to operate.

The Red Team also found that the Dilute and Disposal Alternative would get the plutonium out of South Carolina faster than the MOX project.

Your budget request proposes termination of the MOX project and includes \$9 million to build additional facilities for the Dilute and Disposal Alternative. I look forward to hearing more from General Klotz on this today.

Finally, you are in the early stages of the design for a new Plutonium Facility in New Mexico, the third multi-billion dollar project included in the NNSA budget request. I'd like to hear from the witnesses how we have incorporated the lessons learned from the Uranium Processing Facility and the MOX project into the work for the Plutonium Facility to make sure the project can be completed on time and on budget.

### **Effectively Maintaining our Nuclear Weapons Stockpile**

Another major part of the NNSA's budget is to maintain our nuclear weapons stockpile, and I want to make sure we are spending taxpayer dollars effectively.

The budget request includes \$1.7 billion to continue the four ongoing life extension programs, which fix or replace components in weapons systems to make sure they're safe and reliable.

On my recent trip to Y-12 with Secretary Perry, I saw work on the W76 Life Extension Program when I toured the Beta 2E facility. That tour made two things clear to me—(1) we have some very dedicated and well trained people working every day to modernize our nuclear weapons stockpile, and (2) we need to continue to replace outdated facilities at Y-12 and other nuclear weapons production sites.

During that tour we talked about the innovative contract you used to drive cost savings by the contractor. My understanding is that you have saved several hundred million dollars since 2014, and some of that funding has been reinvested in the site infrastructure.

I'd like to hear more about that today. I would also like to ask you today whether you will be able to meet your production deadlines on time and on budget for the life extension programs.

This work must be done—and it is vital that it be properly managed.

### **Supporting Our Nuclear Navy**

Naval Reactors is responsible for all aspects of nuclear power for our submarines and aircraft carriers.

Naval Reactors has a lot on their plate right now—they are designing a new reactor core for the next class of submarines, refueling a prototype reactor, and building a new spent fuel processing facility.

Admiral Caldwell and I had an opportunity talk about the new spent fuel processing facility last week. It is a part of the Navy's consolidated interim storage for its used nuclear fuel. Interim storage of used nuclear fuel from commercial power reactors is a topic Senator Feinstein have been working on for a long time.

The Navy's program shows that it can be done safely and effectively, but that does not replace the need for a permanent repository at Yucca Mountain. The Navy's used nuclear fuel will still go to Yucca Mountain once it is built.

I look forward to Admiral Caldwell's comments today on the progress he's making on his important work, and particularly how he stores his used nuclear fuel.

The NNSA needs to complete a lot of important work, and this work is going to require good planning and effective oversight.

I look forward to working with the NNSA as we begin putting together our Energy and Water Appropriations bill for fiscal year 2018, and before I turn to Senator Feinstein, I'd like to take a moment to recognize General Klotz's leadership during such an important time for the NNSA. Over the last three years, we have worked together to modernize our nuclear weapons stockpile and make sure we have the facilities and people we need to keep our weapons safe, secure, and effective. Thank you for your service.

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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 2018 President's Budget Request  
Before the  
Subcommittee on Energy and Water Development  
Senate Committee on Appropriations**

**June 14, 2017**

Chairman Alexander, Ranking Member Feinstein, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year (FY) 2018 budget request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). The Committee's strong support for the nuclear security mission and for the people and organizations that are responsible for executing it is deeply appreciated.

The President's FY 2018 budget request for NNSA is \$13.9 billion, an increase of \$1.0 billion, or 7.8% over the FY 2017 Omnibus level. The request represents approximately 50% of DOE's total budget and 68% of DOE's 050 budget.

NNSA's diverse missions are critical to the national security of the United States: maintaining the safety, security, reliability, and effectiveness of the nuclear weapons stockpile; reducing the threat of nuclear proliferation and nuclear terrorism around the world; and providing nuclear propulsion for the U.S. Navy's fleet of aircraft carriers and submarines. This budget request demonstrates the Administration's strong support for NNSA and is vital to ensuring that U.S. nuclear forces are modern, robust, flexible, resilient, ready, and appropriately tailored to deter 21st-century threats and reassure America's allies.

NNSA's activities are accomplished through the expertise, innovative spirit, and hard work of both its federal and its Management and Operating (M&O) contractor employees. NNSA must continue to support these highly-talented, dedicated men and women as they carry out complex and challenging responsibilities. In particular, it is imperative that NNSA modernize its scientific, technical, and engineering capabilities, as well as its infrastructure, in order to provide a safe, modern, and more efficient workspace for its workforce. In doing so, NNSA is mindful of its obligation to continually improve its business practices and to be responsible stewards of the resources that Congress and the American people have entrusted to the agency.

The FY 2018 budget request also reflects the close working partnership between NNSA, the Department of Defense (DoD), the Department of Homeland Security (DHS), the State Department, the Intelligence Community, and other federal departments and agencies. NNSA works closely with DoD to meet military requirements, support the Nation's nuclear deterrent,

and modernize the nuclear security enterprise. NNSA also collaborates with a range of federal agencies to prevent, counter, and respond to nuclear proliferation and nuclear terrorism.

### **Weapons Activities Appropriation**

For the Weapons Activities account, the FY 2018 budget request is \$10.2 billion, an increase of nearly \$1 billion, or 10.8% over the FY 2017 Omnibus level. Programs funded in this account support the Nation's current and future defense posture and its attendant nationwide infrastructure of science, technology, and engineering capabilities. Weapons Activities provide for the maintenance and refurbishment of nuclear weapons to maintain their safety, security, and reliability; investments in scientific, engineering, and manufacturing capabilities to certify the enduring nuclear weapons stockpile; and the fabrication of nuclear weapon components. Weapons Activities also includes investments to make the NNSA nuclear complex more cost effective and more responsive to unanticipated challenges or emerging threats.

### **Maintaining the Stockpile**

This 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 21<sup>st</sup> consecutive year that the U.S. nuclear weapons stockpile remains safe, secure, and reliable without the need for nuclear explosive testing. This remarkable scientific achievement is made possible each year by investments in state-of-the-art diagnostic tools, high performance computing platforms, modern facilities, and most importantly by NNSA's world-class scientists, engineers, and technicians.

For Directed Stockpile Work (DSW), the FY 2018 budget request is \$4.0 billion, an increase of \$669 million, or 20.2% over the FY 2017 Omnibus level.

The major warhead Life Extension Programs (LEPs) are a fundamental part of this account:

- **W76-1 LEP:** The \$224 million requested for the W76-1 LEP directly supports the sea-based leg of the nuclear triad and will keep the LEP on schedule and on budget to complete production in FY 2019.
- **B61-12 LEP:** NNSA continues to make progress on the B61-12 LEP, which will consolidate four variants of the B61 gravity bomb and improve the safety and security of the oldest weapon system in the U.S. nuclear arsenal. In June 2016, NNSA authorized the program to transition into the Production Engineering Phase (Phase 6.4). With the \$788.6 million requested, NNSA will remain on schedule to deliver the First Production Unit (FPU) of the B61-12 in FY 2020. NNSA is responsible for refurbishing the nuclear explosives package and updating the electronics for this weapon, while the Air Force will provide the tail kit assembly under a separate acquisition program. When fielded, the B61-12 gravity bomb will support both Air Force long-range nuclear-capable bombers and dual-

capable fighter aircraft, bolstering central deterrence for the United States while also providing extended deterrence to America's allies and partners.

- **W88 Alteration (Alt) 370 Program:** In February 2017, NNSA began the Production Engineering Phase (Phase 6.4) for the W88 Alt 370 Program, including conventional high explosives refresh activities. The budget request for this program, which also supports the sea-based leg of the nuclear triad, includes \$332 million in FY 2018, an increase of \$51 million, or 18.2% over the FY 2017 Omnibus level, to support the scheduled FPU in FY 2020.
- **W80-4 LEP:** The FY 2018 budget request is \$399 million, an increase of \$179 million, or 81.2% over the FY 2017 Omnibus level. This funding supports a significant increase in program activity through the Design Definition and Cost Study Phase (Phase 6.2A), driving toward a FY 2025 FPU in support of the Air Force's Long Range Stand-Off (LRSO) cruise missile program.

Also within DSW, the FY 2018 budget request includes \$1.5 billion for Stockpile Systems and Stockpile Services. These programs sustain the stockpile in accordance with the Nuclear Weapon Stockpile Plan by producing and replacing limited-life components such as neutron generators and gas transfer systems; conducting maintenance, surveillance, and evaluations to assess weapon reliability; detecting and anticipating potential weapon issues; and compiling and analyzing information during the Annual Assessment process.

NNSA continues to make progress on the Joint Technology Demonstrator (JTD) program, a strategic collaboration between the United States and the United Kingdom under the Mutual Defense Agreement. This program is intended to reduce technological risk and provide relevant data for future program activities. JTD's focus is on technologies and process improvements that can improve weapon affordability and enhance weapon safety and security.

Within DSW, the FY 2018 budget request also includes \$695 million for Strategic Materials. This funding is necessary to maintain NNSA's ability to produce the nuclear and other strategic materials associated with nuclear weapons as well as refurbish and manufacture components made from these materials. The program includes Uranium Sustainment, Plutonium Sustainment, Tritium Sustainment, Domestic Uranium Enrichment (DUE), and other strategic materials, such as lithium.

Funding for Uranium Sustainment will permit operations with enriched uranium 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.

Plutonium Sustainment funds the replacement and refurbishment of equipment and critical skills needed to meet the pit production requirements. Increases are included to fabricate several W87 developmental pits. Investments to replace pit production equipment which has

reached the end of its useful life and install equipment to increase production capacity are also continued.

Tritium Sustainment ensures the Nation's capacity to provide the tritium for national security requirements by irradiating Tritium Producing Burnable Absorber Rods in designated Tennessee Valley Authority nuclear power plants and by recovering and recycling tritium from gas transfer systems returned from the stockpile.

The DUE program continues its efforts to ensure that NNSA has the necessary supplies of enriched uranium for a variety of national security needs. Funding increases are included in this year's request to begin down-blending available stocks of unobligated highly enriched uranium (HEU) for use in tritium production, which delays the need date for a DUE capability until at least 2038-2041.

The FY 2018 budget request also includes \$52 million for Weapons Dismantlement and Disposition to allow NNSA to remain on track with the goal of dismantling all weapons retired prior to FY 2009 by the end of FY 2022.

For Research, Development, Test, and Evaluation (RDT&E), the FY 2018 budget request is \$2 billion, an increase of \$186 million or 10.1% over the FY 2017 Omnibus level.

Increases for the Science Program (\$487.5 million, an increase of \$51 million) provide additional funding for the Advanced Sources and Detectors Major Item of Equipment in support of the Enhanced Capabilities for Subcritical Experiments (ECSE) effort.

The Engineering Program (\$193.1 million, an increase of \$61 million) sustains NNSA's trusted microsystems capability and further develops the Stockpile Responsiveness Program (SRP). NNSA is requesting \$40 million in FY 2018 for SRP to identify, sustain, enhance, integrate, and continually exercise the capabilities required to conceptualize, study, design, develop, engineer, certify, produce, and deploy nuclear weapons. These activities are necessary to ensure the U.S. nuclear deterrent remains safe, secure, reliable, credible, and responsive. The funding will support the creation of design study teams to explore responsiveness concepts as well as development of capabilities for accelerating the qualification and production cycle.

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 LLNL in California, the Z-Machine at Sandia National Laboratories in New Mexico, and the OMEGA laser facility at the University of Rochester in New York. In FY 2016, NIF exceeded the goal of 400 data-acquiring shots (417), more than double the number of shots executed in FY 2014 (191) in support of the SSP. The improved shot rates have accelerated progress towards the achievement and application of multi-megajoule fusion yields, investigating material behaviors in conditions presently inaccessible via other experimental techniques, and improving the predictive

capability of NNSA's science and engineering models in high-pressure, high-energy, high-density regimes.

The RDT&E request for FY 2018 includes \$734 million for the Advanced Simulation and Computing (ASC) Program. NNSA is taking major steps in high performance computing (HPC) to deliver on its missions by deploying increasingly powerful computational capabilities to both Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory (LLNL). In the summer of 2017 – Trinity – NNSA's next generation high performance computer, will become fully available for classified use at LANL. This computer will be about 30 times more powerful than the Cielo super computer it is replacing. The Sierra HPC system will be deployed at LLNL starting this year; it is projected to provide four to six times the sustained performance of LLNL's current HPC system, Sequoia.

The RDT&E request also increases NNSA's contribution to the Exascale Computing Initiative (ECI) from \$95 million in FY 2017 to \$161 million in the FY 2018 request. The ECI is a collaboration with DOE's Office of Science to develop the technology needed for exascale-class high performance computing. The increased funding will provide for NNSA-specific application development, and improve software and hardware technologies for exascale computing in order to meet NNSA's needs for future assessments, LEPs, and stockpile stewardship. Specifically, exascale computing will provide capabilities to improve weapon performance simulation tools and techniques; evaluate the safety, security, and effectiveness of the current stockpile; and provide support to certify potential advanced surety features for the future stockpile.

NNSA's Secure Transportation Asset (STA) program provides safe, secure movement of nuclear weapons, special nuclear material (SNM), and weapon components to meet projected DOE, DoD, and other customer requirements. The Office of Secure Transportation (OST) has an elite workforce performing sensitive and demanding work; OST agents are among the most highly trained national security personnel operating within the United States. Since FY 2012, STA has repeatedly been funded below the Administration's budget requests. This trend increases risks and possible production delays to the Mobile Guardian Transporter (MGT) and adversely affects OST's ability to recruit and retain agents. The FY 2018 budget request of \$325.1 million includes an increase of \$76 million or 30.6% over the FY 2017 Omnibus level to continue asset modernization and workforce capability initiatives. These initiatives include: 1) restoration of federal agent strength levels to meet the goal of 370 agents; 2) the Safeguards Transporter (SGT) Risk Reduction Initiatives to manage the SGT beyond its design life; 3) procurement of long-lead parts and materials for the two full scale MGT prototype systems; and 4) deferred facilities maintenance and minor construction projects at multiple sites.

### **Improving Safety, Operations, and Infrastructure**

NNSA's ability to achieve its vital national security missions is dependent upon safe and reliable infrastructure. If not appropriately addressed, the age and condition of NNSA's infrastructure will put NNSA's missions, the safety of its workers, the public, and the environment at risk.

More than half of NNSA's facilities are over 40 years old, and roughly 30% date back to the Manhattan Project era. The FY 2018 budget request for Infrastructure and Operations is \$2.8 billion, a decrease of \$5 million, or 0.2% below the FY 2017 Omnibus level. The request actually represents an increase of \$195 million (7.5%) after adjusting for the one-time \$200 million Bannister Federal Complex project funded in FY 2017. This funding will help modernize and upgrade antiquated infrastructure and address safety and program risks through strategic investments in general purpose infrastructure and capabilities that directly support NNSA's nuclear weapons and nonproliferation programs.

In August 2016, NNSA broke ground on the Administrative Support Complex at the Pantex nuclear weapons assembly and dismantlement facility in Amarillo, Texas. The site's M&O contractor entered into a lease agreement for a new office building that a private developer is building using third-party financing. This project will allow roughly 1,000 employees to move out of dilapidated, 1950s-era buildings into a modern, energy efficient workspace. It will also eliminate approximately \$20 million in deferred maintenance at the Pantex site and enhance recruitment and retention by improving the quality of the work environment. The project will be completed and staff will move into the new facility, by spring 2018.

The FY 2018 budget request further reduces deferred maintenance and supports the execution of new recapitalization projects to improve the condition and extend the design life of structures, capabilities, and systems to meet program demands; decrease overall operating costs; and reduce safety, security, environmental, and program risk. The request also supports general purpose infrastructure and program-specific capabilities through Line Item Construction projects. These projects include the Uranium Processing Facility (UPF) at Y-12, the Chemistry and Metallurgy Research Replacement (CMRR) project at LANL, and the Albuquerque Complex Project.

One of the most worrisome of the NNSA infrastructure challenges is the excess facilities that pose risks to NNSA's workers, the environment, and the nuclear security mission. As of the end of FY 2016, NNSA had 417 excess facilities, 79 of which were identified as high-risk excess facilities, including 58 at the Kansas City Bannister Federal Complex. Many of these facilities will ultimately be transferred to the DOE Office of Environmental Management (EM) for disposition, and the EM FY 2018 budget requests \$225 million to address high-risk excess facilities at Y-12 and LLNL. In the interim, NNSA is focusing on reducing the risk where it can. The FY 2018 budget request supports a number of activities related to excess facilities. NNSA benefitted enormously from funding provided by Congress in FY 2017 for the disposition of the Bannister Federal Complex in Kansas City. The disposition project is on track, with final pre-transfer activities occurring now.

The Office of Defense Nuclear Security (DNS) develops and implements security programs to protect sensitive nuclear material (SNM), people, information, and facilities throughout the nuclear security enterprise. The FY 2018 budget request is \$687.0 million, an increase of \$1.5 million, or 0.2% over the FY 2017 Omnibus level that included funding to address immediate infrastructure needs at Pantex and Y-12. The request manages risk among important

competing demands as NNSA continues to face the challenges associated with physical security infrastructure that must be effectively addressed in the coming years. NNSA is finalizing a 10-Year Plan to Recapitalize Physical Security Systems Infrastructure, also known as the 10-Year Plan, which identifies and prioritizes the replacement and refresh of physical security infrastructure across the nuclear security enterprise. Of note, the request includes preliminary planning and conceptual design funds for future projects, as outlined in the 10-Year Plan, to sustain and recapitalize the Perimeter Intrusion Detection and Assessment System (PIDAS) at the Pantex Plant and Y-12.

Information Technology and Cybersecurity enable every facet of the NNSA mission. The FY 2018 budget request is \$186.7 million, an increase of \$10 million, or 5.7% over the FY 2017 Omnibus level. This increase will fund much needed improvement to the Information Technology and Cybersecurity program, including Continuous Diagnostic and Mitigation, Telecommunications Security, infrastructure upgrades for the Enterprise Secure Computing Network (ESN), Public Key Infrastructure (PKI), Energy Sciences Network program, and an increased information technology budget. The cybersecurity program continuously monitors enterprise wireless and security technologies to meet a wide range of security challenges. In FY 2018, NNSA plans to continue the recapitalization of the ESN, 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. The requested funding increase will allow NNSA to continue working toward a comprehensive information technology and cybersecurity program to deliver critical information assets securely.

### **Defense Nuclear Nonproliferation Appropriation**

The FY 2018 budget request for the Defense Nuclear Nonproliferation (DNN) account is \$1.8 billion, a level consistent with the FY 2017 Omnibus level. This appropriation covers NNSA's critical and far-reaching nuclear threat reduction activities. 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 them; and responding to possible nuclear and radiological incidents. The FY 2018 budget request funds two program mission areas under the DNN account: the Defense Nuclear Nonproliferation Program and the Nuclear Counterterrorism and Incident Response (NCTIR) Program.

### **Nonproliferation Efforts**

Working with international partners, the Office of Defense Nuclear Nonproliferation removes or eliminates vulnerable nuclear material; improves global nuclear security through multilateral and bilateral technical exchanges and training workshops; helps prevent the illicit trafficking of nuclear and radiological materials; secures domestic and international civilian buildings containing high-priority radiological material; provides technical reviews of U.S. export license applications; conducts export control training sessions for U.S. enforcement agencies and international partners; strengthens the IAEA's ability to detect and deter nuclear proliferation;

advances U.S. capabilities to monitor arms control treaties and detect foreign nuclear programs; and maintains organizational readiness to respond to and mitigate radiological or nuclear incidents worldwide.

The Material Management and Minimization (M<sup>3</sup>) program provides an integrated approach to addressing the risk posed by nuclear materials. The FY 2018 budget request is \$332.1 million, an increase of \$44 million or, 15.2% over the FY 2017 Omnibus level. The request supports the conversion or shut-down of research reactors and isotope production facilities that use HEU; acceleration of new, non-HEU-based molybdenum-99 production facilities in the United States; the removal and disposal of WUNM; and the completion of the lifecycle cost estimate and schedule for the dilute and dispose option for 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 2018 budget request for this program is \$337.1 million, a decrease of \$30 million, or 8.2% below the FY 2017 Omnibus level.

The Nonproliferation and Arms Control (NPAC) program develops and implements 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 challenges. The FY 2018 budget request for this program is \$129.7 million, an increase of \$5 million, or 4.0% over the FY 2017 Omnibus level. This increase serves to improve the deployment readiness of U.S. nuclear disablement and dismantlement verification teams and to enhance export control dual-use license and interdiction technical reviews.

The DNN Research and Development (DNN R&D) program supports innovative unilateral and multilateral technical capabilities to detect, identify, and characterize foreign nuclear weapons programs, illicit diversion of SNM, and nuclear detonations worldwide. The FY 2018 budget request for this program is \$446.1 million, a decrease of \$23.7 million, or 5.0% below the FY 2017 Omnibus level. The decrease in funding reflects a shift of \$53 million from R&D back to M<sup>3</sup> for the U.S. High Performance Research Reactors Program and is offset by an increase of \$29 million for planned R&D activities.

Nonproliferation Construction consolidates construction costs for DNN projects. The FY 2018 budget request is \$279 million, a decrease of \$56 million, or 16.7% below the FY 2017 Omnibus level. The Administration proposes to terminate the Mixed Oxide Fuel Fabrication (MFFF) project and to pursue the dilute and dispose option to fulfill the United States' commitment to dispose of 34 metric tons of plutonium. If supported by Congress, \$270 million would be used to achieve 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. In addition, \$9 million is provided for the Surplus Plutonium Disposition project to support the dilute and dispose strategy.

## **Nuclear Counterterrorism and Counterproliferation**

In FY 2016, the NCTIR Program transitioned to the DNN account from the Weapons Activities account to align all NNSA funding to prevent, counter, and respond to nuclear proliferation and nuclear terrorism under the same appropriations account. The FY 2018 budget request includes \$277.4 million to support the NCTIR Program, an increase of \$5 million, or 2.0% over the FY 2017 Omnibus level. Within NCTIR, NNSA continues to work domestically and internationally to prepare for and improve the Nation's ability to respond to radiological or nuclear incidents.

NNSA's counterterrorism and counterproliferation programs are part of broader U.S. Government efforts to assess the threat of nuclear terrorism and develop technical countermeasures. The scientific knowledge generated under this program ensures NNSA's technical expertise on potential nuclear threat devices, including improvised nuclear devices (INDs), supports and informs U.S. nuclear security policy, and guides nuclear counterterrorism and counterproliferation efforts, including interagency nuclear forensics and contingency planning.

NNSA emergency response teams' current equipment is aging, resulting in increasing maintenance expenses and imposing increased risks to 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 the necessary steps to minimize hazards. To ensure that NNSA is able to execute its radiological emergency response mission, RAP's equipment must be recapitalized regularly. NNSA is acquiring state-of-the-art, secure, deployable communications systems that are interoperable with Federal Bureau of Investigation and DoD mission partners, ensuring that decision makers receive real-time technical recommendations to mitigate nuclear terrorist threats.

NNSA recently concluded an Analysis of Alternatives (AoA) on the Aerial Measuring System (AMS) aircraft. The AMS fleet consists of three B200 fixed-wing aircraft with an average age of 33 years and two Bell 412 helicopters with an average age of 24 years. The current aircraft are experiencing reduced mission availability due to increasing unscheduled downtime and maintenance. The AoA determined that NNSA recapitalization of the aging aircraft fleet is necessary in order to provide rapid aerial radiological exposure and contamination information to Federal, State, and local officials following an accident or incident in order to protect the public and first responder's health and safety. NNSA anticipates proposing a two-year replacement schedule starting in FY 2019.

## **Naval Reactors Appropriation**

### **Advancing Naval Nuclear Propulsion**

NNSA provides nuclear propulsion for the U.S. Navy's nuclear-powered fleet, which is critical to the security of the United States and its allies as well as the security of global sea lanes. The

Naval Reactors Program remains at the forefront of technological developments in naval nuclear propulsion. This preeminence derives from advancing new technologies and improvements in naval reactor performance, ensuring a commanding edge in warfighting capabilities.

The Naval Reactors FY 2018 budget request is \$1.48 billion, an increase of \$60 million, or 4.2% above the FY 2017 Omnibus 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 workforce. The projects include: 1) continuing design and development of the reactor plant for the *COLUMBIA*-Class submarine, which will feature a life-of-ship core and electric drive; 2) refueling a Research and Training Reactor in New York to facilitate *COLUMBIA*-Class 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 2018 to support these projects and 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 Bettis Atomic Power Laboratory in Pittsburgh, Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and the spent nuclear fuel facilities in Idaho 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, the laboratories 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.

### **NNSA Federal Salaries and Expenses Appropriation**

The NNSA Federal Salaries and Expenses (FSE) FY 2018 budget request is \$418.6 million, an increase of \$31.5 million, or 8.1% over the FY 2017 Omnibus level. The FY 2018 budget request provides funding for 1,715 full-time equivalents (FTE), which includes a 1.9% cost of living increase, a 5.5% increase for benefit escalation, and other support expenses needed to meet mission requirements. NNSA is actively engaged in hiring to reach that number in a thoughtful and strategic manner. The FY 2018 budget request for 1,715 FTEs is an increase of 25 above the authorized 1,690. Since 2010, NNSA's program funding has increased 28%, while staffing has decreased 17%. In FY 2018, NNSA will continue efforts to meet current and future workforce needs by analyzing job requirements to meet evolving missions, including completion of a study by the Office of Personnel Management in support of the Reform of Government Initiative. Initial results from four program offices and one field office indicate the need for a 20% increase in federal staff.

## **Management & Performance**

Since 2011, NNSA has delivered approximately \$1.4 billion in projects, a significant portion of NNSA's total project portfolio, 8% under original budget. This past February, the High Explosive Pressing Facility at Pantex achieved CD-4 and was completed \$25 million under the approved baseline. NNSA is committed to encouraging competition and increasing the universe of qualified contractors by streamlining its major acquisition processes. NNSA will continue to focus on delivering timely, best-value acquisition solutions for all of its programs and projects, using a tailored approach to contract structures and incentives that is appropriate for the special missions and risks at each site. NNSA's Office of Acquisition and Project Management (APM) is leading continued improvement in contract and project management practices and NNSA's effort to institute rigorous analyses of alternatives; provide clear lines of authority and accountability for program and project managers; 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.

## **Conclusion**

NNSA's diverse missions are crucial to the security of the United States, the defense of its allies and partners, and global stability writ large. The U.S. nuclear deterrent has been the cornerstone of America's national security since the beginning of the nuclear age, and NNSA has unique responsibilities to ensure its continued safety, security, reliability, and effectiveness. Likewise, NNSA's nuclear nonproliferation and nuclear counterterrorism activities are essential to promoting the peaceful use of nuclear energy and preventing malicious use of nuclear and radiological materials around the world. Finally, NNSA's support to the U.S. Navy allows the United States to defend its interests abroad and protect the world's commercial shipping lanes. Each of these critical missions depends upon NNSA's capabilities, facilities, infrastructure, and world-class workforce.

Statement of Admiral James F. Caldwell  
Deputy Administrator for Naval Reactors  
National Nuclear Security Administration  
U.S. Department of Energy  
on the  
Fiscal Year 2018 President's Budget Request  
Before the  
Senate Committee on Appropriations  
Subcommittee on Energy and Water Development

June 14, 2017

Since USS NAUTILUS (SSN 571) first signaled "*Underway on nuclear power*" in 1955, our nuclear powered ships have made extraordinary contributions to our national defense. From the start of the Cold War to today's multi-threat environment, our nuclear navy ensures continued dominance of American seapower. Over 45 percent of the Navy's major combatants are nuclear powered (10 aircraft carriers, 14 ballistic missile submarines, 57 attack submarines, and 4 guided missile submarines) capitalizing on the mobility, flexibility, and endurance of nuclear power that enables the Navy to meet its global mission.

Over the past year, the Navy, with Naval Reactors support, deployed 33 submarines and conducted 32 strategic deterrent patrols. In addition, at any given time, there were always at least 56 of 75 submarines deployed or ready to deploy within a few days. Our carriers, USS JOHN C. STENNIS (CVN 74), USS HARRY S. TRUMAN (CVN 75), and USS DWIGHT D. EISENHOWER (CVN 79), completed successful deployments, and the USS RONALD REAGAN (CVN 76) stood ready as the forward-deployed carrier in Japan. We also saw the christening of the attack submarines PCU COLORADO (SSN 788) and PCU INDIANA (SSN 789), our fifteenth and sixteenth VIRGINIA class submarines. We have also added another attack submarine to our force by commissioning USS ILLINOIS (SSN 786), and the Navy's newest submarine USS WASHINGTON (SSN 787) was delivered. And last, as a testament to the ability of our design and technical base, USS HELENA (SSN 725) made submarine history by being the first submarine to travel 1 million nautical miles on a single reactor core.

Recently, I participated in sea-trials on the first FORD Class Aircraft Carrier, the GERALD R. FORD (CVN 78) which was delivered on May 31. This ship has the first new design aircraft carrier propulsion plant in 40 years, and I'm happy to report that in terms of propulsion capability, FORD met the high speed of our NIMITZ-Class ships and delivered major increases in electrical power and core energy with half the manning in the reactor department. While we have worked through several challenges testing and operating the first-of-class propulsion and electrical generation and distribution system on the ship, the fact that these problems were safely and efficiently resolved is a testament to the technical skills and hard work of the nuclear shipbuilding design and industrial base, as well as the skilled Sailors operating this equipment. 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.

In addition to supporting these nuclear powered combatants, Naval Reactors has safely maintained and operated two nuclear powered land-based prototypes – both over 39 years old – to conduct research, development, and training, as well as two Moored Training Ships – both over 53 years old – the oldest operating pressurized water reactors in the world. These operational reactors provide highly qualified operators to the nuclear fleet, and today our nuclear fleet is fully manned.

The strong 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) 2018 is \$1.48 billion, an increase of 60 million dollars, or 4 percent, over the FY 2017 enacted funding level. In addition to supporting today's operational fleet, the requested funding will enable Naval Reactors to deliver tomorrow's fleet by continuing funding for three national priority projects and recruiting and retaining a unique, highly skilled work force committed to the Navy and the nation. The projects are:

- Continuing to design the new propulsion plant for the COLUMBIA-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 COLUMBIA-class 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.

We are at our peak in design efforts supporting the new propulsion plant for the COLUMBIA-class SSBN - 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 it continues to be the most survivable leg of the nuclear triad. COLUMBIA-class SSBN activity this year includes reactor plant design and component development to support procurement of long lead reactor plant components in FY 2019. The funding requested ensures we maintain progress with this plan and alignment with the Navy as the program moves toward construction start in FY 2021.

Supporting both the COLUMBIA-class effort and the Program's training needs, the FY 2018 budget request supports the land-based prototype refueling overhaul at the Kesselring Site in upstate New York. In FY 2018, Naval Reactors continues the core manufacturing work needed for the refueling overhaul, which retires manufacturing risk for the life-of-ship core for COLUMBIA-class. Further, plant service-life engineering design will be largely completed in FY 2018 to ensure that the land-based prototype overhaul, performed concurrently with refueling, supports 20 additional years of Naval Reactors' commitment to research, development, and training in upstate New York.

The Naval Reactors FY 2018 Budget Request also contains funds to continue the Spent Fuel Handling Recapitalization Project. Congressional support in FY 2016 and FY 2017 for this much needed project has enabled progress on site preparations, long lead material procurements

starting this fiscal year, and approval of the National Environmental Policy Act Environmental Impact Statement Record of Decision. In addition to starting site preparation and long lead material procurements, we are using the \$100 million received in FY 2017 to finalize key facility and equipment requirements and advance facility design to support establishing the Performance Baseline and authorizing the start of construction in FY 2018. Continued Congressional support will ensure that the facility in Idaho is ready to receive spent nuclear fuel from aircraft carriers in FY 2024 and be fully operational by 2025.

In addition to our three main priority projects, Naval Reactors also maintains a high-performing technical base to execute nuclear reactor technology research and development that guarantees our Navy remains technologically ahead of adversaries, as well as the necessary equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing an efficient and effective technical base, the teams of talented and dedicated people at our four Program sites – the Bettis Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and the Naval Reactors Facility in Idaho – can perform the research and development, analysis, engineering, and testing needed to support today’s fleet at sea and develop more capable nuclear-powered warships. Our labs perform the technical evaluations that enable Naval Reactors to thoroughly assess approximately 4,000 emergent issues annually and deliver timely responses that ensure nuclear safety and maximize operational flexibility. This technical base supports more than 17,500 nuclear-trained Navy sailors, who safely maintain and operate the 101 nuclear propulsion plants in the fleet 24 hours per day, 365 days per year around the globe.

At the requested funding level, Naval Reactors can safely maintain and oversee the nuclear-powered fleet. Naval Reactors is committed to executing our projects on time and on budget, and continuing the drive 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 2018 Budget Request.