

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2023

WEDNESDAY, MAY 18, 2022

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:04 a.m. in room SD-192, Dirksen Senate Office Building, Hon. Dianne Feinstein (chairwoman) presiding.

Present: Senators Feinstein, Heinrich, Kennedy, and Hagerty.

DEPARTMENT OF ENERGY

NATIONAL NUCLEAR SECURITY ADMINISTRATION

STATEMENT OF HON. JILL HRUBY, UNDER SECRETARY FOR NUCLEAR SECURITY AND ADMINISTRATOR

ACCOMPANIED BY:

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OPENING STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. The Subcommittee on Energy and Water Development will come to order.

Today's hearing is going to review the National Nuclear Security Administration's fiscal year 2023 budget request.

So thank you, Administrator Hruby and your colleagues for joining us today.

The budget request for NNSA (National Nuclear Security Administration) totals \$21.4 billion. That's a \$754.4 million or a 3.6 percent increase over fiscal year 2022. I can say it's an all-time high once again.

The Defense Nuclear Nonproliferation Programs, which successfully reduce nuclear dangers, are essentially held flat. For such accomplished programs, I would expect to see some greater investment but just a few key nonproliferation achievements include the elimination of over 7,230 kilograms of weapons-usable nuclear material from 48 countries, deployment of 930 counter-nuclear smuggling systems across 79 countries, and compilation of the 238 Cesium Irradiator Replacement Project, their removals from U.S. hospitals and universities.

While nonproliferation programs are held flat, the Weapons Activities Account sees a \$566.2 million or 3.5 percent increase. Both are budget allocations and the Nuclear Weapons Complex itself will increasingly struggle to accommodate an over-taxed system. So I expect this Administration to really make thoughtful choices.

I'm concerned about plutonium pit production. NNSA is required to make 80 pits per year by 2030 but acknowledged it would miss that deadline by anywhere from 2 to 5 years.

While NNSA's fiscal year 2023 budget calls for a \$2.4 billion increase for pit production modernization and infrastructure, it's clear that increased funding year after year is not going to solve systemic problems.

So I look forward to hearing you discuss with us how we can confront our nuclear deterrence and budgetary challenges together. I think that's most important and I thank everyone for being here.

The distinguished Ranking Member Kennedy will now have an opening statement and then we will turn to Administrator Hruby to present testimony on behalf of NNSA.

Thank you.

STATEMENT OF SENATOR JOHN KENNEDY

Senator KENNEDY. Thank you, Madam Chair.

Madam Administrator, thank you for being here. Thanks to all of our witnesses.

I can't think of an agency more important than the Nuclear Security Administration, especially now.

This proposed budget is not adequate. It's just not. I know there's a slight increase in funding, but I tell you what's not slight, the risks that the world faces today that have been extraordinarily enhanced in the last 3–4 months.

I mean, anybody with a brain above a single cell organism, which is most Americans, can see what's going on in the world. President Putin is working with President Xi, is working with the Ayatollah in Iran. I think President Xi is the quarterback but the other two players are critical members of the team. I think their goal is to have Russia dominate Central and Eastern Europe. I think their goal is to have China dominate the Indo-Pacific and be allowed to roam free in at least Sub-Saharan Africa and maybe all of Africa and also make moves in South America, and I think their goal is to have the Ayatollah in Iran dominate the Middle East.

Now I view all of this through the lens of the security of the United States of America. I do not want America to have to be the world's policemen, but I don't want Russia and China and the Ayatollah to be the world's policemen either.

This budget, proposed budget eliminates two weapon systems. It underfunds programs vital to our national security. Our distinguished Chair mentioned plutonium pit production. This proposed budget eliminates the tactical submarine-launched cruise missile, not acceptable. It's going to retire the B83 Gravity Bomb. It's got inadequate funding for plutonium pit modernization.

We can do better. American people deserve better, and I'm hoping we can talk about that today. But thank you all for being here and thank you, thank you to our Chair. I'm sitting close to her. I'm

hoping some of that wisdom and experience permeates over this way——

Senator FEINSTEIN. Oh, wow.

Senator KENNEDY [continuing.] And I mean that. I mean that.

I sit on Judiciary and the Senator was Chairman of our Judiciary Committee for a long time and I had the wonderful experience of being there with her for that, too.

So I'm done, Madam Chair.

Senator FEINSTEIN. Thank you.

We will turn over to our witnesses. I think Administrator Hruby.

SUMMARY STATEMENT OF HON. JILL HRUBY

Ms. HRUBY. Thank you. Thank you, Chairwoman Feinstein, Ranking Member Kennedy, and Members of the Subcommittee for the opportunity to present the President's fiscal year 2023 budget request for the Department of Energy's National Nuclear Security Administration.

We're grateful for the committee's enduring bipartisan support.

Chairwoman Feinstein, a written statement has been provided to the subcommittee and I respectfully request that it be submitted for the record.

Senator FEINSTEIN. So ordered.

Ms. HRUBY. NNSA's fiscal year 2023 budget request, as mentioned, is \$21.4 billion. This request is consistent with our expanded mission and the increasing pace of program deliverables as described in the 2022 Nuclear Posture Review.

In today's geopolitical environment, this budget reflects a responsive and responsible path forward.

The weapons activities request is \$16.5 billion, supporting five warhead modernization program, significant infrastructure recapitalization, and science-based stockpile stewardship.

NNSA is currently engaged in the simultaneous execution of our largest weapon modernization program effort in decades and an overhaul of our aging infrastructure. This approach carries risk but we are positioned to succeed and we are making progress.

The W88 Alt 370 and the B61-12 have achieved first production and are on track to meet DoD (Department of Defense) deliverables. The W80-4, the W87-1, and the W93 are in various phases of design and will enter production in the 2020s and 2030s. When complete, these programs, coupled with the DoD platform modernization, will update all three legs of the Nuclear Triad.

On the infrastructure front, the Uranium Processing Facility is fully enclosed with a projection completion date of 2026 and the 90 percent designs are underway for our future pit production facilities at Los Alamos and Savannah River.

Additionally, our innovative approaches on non-nuclear construction have demonstrated shortened schedule and reduced costs. We intend to build on these successes going forward.

Our scientific achievements in stockpile understanding continue and we intend to build on decades of success. This budget continues funding for the enhanced capabilities for subcritical experiments, inertial confinement fusion, exascale computing, and other key capabilities.

The Defense Nuclear Nonproliferation budget request of \$2.3 billion demonstrates the Administration's commitment to reducing global nuclear threats and is an essential complement to the weapons activities.

Through judicious use of prior year funding, we have a stable budget that enables targeted increases in high-priority projects. We continue to believe that it is easier to prevent a threat than to roll one back and that technical cooperation on nonproliferation, counterterrorism, and counter-proliferation with global allies and partners enhances our national security.

Such preemptive action and cooperation have been especially important in response to the invasion of Ukraine. In 2012, NNSA removed over 234 kilograms of highly-enriched uranium from Ukraine. Clearly the risks on the ground are lower today as a result.

More recently, NNSA personnel have been engaged in monitoring Ukraine's nuclear facilities and are in close contact with Ukrainian, regional, and IAEA (International Atomic Energy Agency) officials. As a result, we are providing validated data to assist U.S. decision-makers.

NNSA is increasing our support of nuclear power as a clean energy source to combat climate change. We are expanding our efforts in safeguards and security by design for advanced reactors and are working to supply high-assay low-enriched uranium to support the development of advanced reactors in partnership with DOE (Department of Energy) Nuclear Energy.

The Naval Reactors budget request of \$2.1 billion will support our nuclear-powered fleet. Progress on Columbia Class submarine propulsion, ongoing construction of the Spent Fuel Handling Facility, and expanded research and development are all key factors in retaining our qualitative advantage and naval capability for the current and future fleet.

Finally, we recognize that our people are the backbone of our enterprise. NNSA's Federal salaries and expenses budget request of \$496 million will be used to recruit, retain, and support 1,958 Federal employees.

Today, NNSA faces mission requirements as difficult as any in its history. With your continued support, we will deliver.

Thank you and I look forward to your questions.

[The statements follow:]

PREPARED STATEMENT OF HON. JILL HRUBY

Chairman Feinstein, Ranking Member Kennedy, and Members of the Subcommittee, thank you for the opportunity to present the President's fiscal year 2023 budget for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA greatly appreciates the Committee's bipartisan support for our nuclear security mission and for the talented and dedicated workforce responsible for carrying it out every day.

The Department meets its enduring national security mission by maintaining and modernizing the nuclear weapons stockpile so that it is always safe, secure, reliable, and effective; by reducing global nuclear threats; and by providing the U.S. Navy's nuclear-powered submarines and aircraft carriers with militarily effective propulsion systems. NNSA remains uniquely qualified to fulfill these tasks on behalf of the American people and in support of our allies and partners.

The NNSA fiscal year 2023 budget request is informed by the 2022 Nuclear Posture Review and reflects today's increasingly complex geopolitical environment. Importantly, the budget request provides full support for the significant nuclear weap-

ons design and production required to modernize all three legs of the nuclear triad. Once complete, this effort will provide the U.S. with a safer, more secure, and more reliable stockpile that, together with the Department of Defense (DoD) modernization programs, will provide the U.S. with a modern nuclear deterrent capable of responding to a wider array of challenges. The fiscal year 2023 budget request also includes continued funding for the NNSA infrastructure revitalization program needed to produce the weapons and materials for the planned program of record and create an enterprise that is more resilient and flexible. Funding for research, technology, and engineering needed for stockpile certification and innovation activities is maintained in the request.

At the same time, the fiscal year 2023 budget request recognizes we must press ahead with our nuclear nonproliferation and nuclear counterterrorism and counterproliferation efforts as a complementary approach to respond to geopolitical realities. These programs continue efforts to implement and support robust security and safeguards for nuclear materials; shift commercial, research, and medical industries away from highly radioactive materials and technologies; and develop technologies for early detection of proliferation activity. This request recognizes the increased efforts required as nuclear power expands around the world in response to climate change, and as Russia, China, and North Korea continue to diversify and expand their nuclear arsenals.

The NNSA budget request provides the support needed for Naval Reactors to continue work designing, producing, operating, and maintaining the nuclear propulsion plants for U.S. nuclear submarines and aircraft carriers. The request also fully supports three critical initiatives: the *COLUMBIA*-class ballistic missile submarine reactor systems development; construction of the Naval Spent Fuel Handling Facility; and the refueling and overhaul of the land-based reactor for continued training and technology testing.

In today's multipolar and more aggressive geopolitical environment, it is imperative that NNSA is both responsive to needs and acts responsibly to avoid escalation or arms racing while preparing for an uncertain future. Our budget request reflects this balance, and our work has never been more critical to global stability.

NNSA'S ACCOMPLISHMENTS IN 2021

Last year, NNSA achieved several key milestones across the nuclear security enterprise despite the unprecedented circumstances COVID-19 presented.

Life Extension and Weapons Modernization Programs: In 2021, NNSA completed first production units (FPU) for the W88 Alteration (Alt) 370 and the B61-12 Life Extension programs. Both refurbished weapons have increased safety and reliability.

Large Line-Item Construction: NNSA has three large line-item construction projects for nuclear materials underway: two projects associated with plutonium pit production—one at Los Alamos National Laboratory and one at the Savannah River Site—and one project associated with uranium processing at the Y-12 National Security Complex.

The Los Alamos Plutonium Pit Production Project (LAP4) received Critical Decision (CD)-1 approval in April 2021. The Savannah River Plutonium Processing Facility (SRPPF) received CD-1 approval in June 2021. CD-1 approval marks completion of a project's definition phase and the conceptual design as part of DOE's Order 413.3B process for the acquisition of capital assets. Clearing the CD-1 process allows NNSA to establish 90 percent design and associated cost estimation during the subsequent CD-2 effort.

The Uranium Processing Facility (UPF), consisting of seven subprojects, has completed three projects on schedule and under budget and the final four are underway. During 2021, significant construction activity continued and led to the successful full enclosure of all buildings in April 2022, setting the stage for equipment installation.

National Ignition Facility (NIF): In August, the National Ignition Facility at Lawrence Livermore National Laboratory achieved a breakthrough with an experiment that yielded more than 1.3 megajoules of energy and resulted in a burning plasma state for the first time in any fusion research facility. Burning plasma research is needed for high fidelity modeling of nuclear weapons and is one of the milestones needed to achieve self-sustaining energy production.

Secure Transportation: The Office of Secure Transportation accomplished 100 percent of its assigned missions safely and securely with no mission degradation despite operational challenges present from COVID-19.

Infrastructure Innovation: NNSA purchased the LeMond Carbon Facility in Oak Ridge, TN to replace facilities at Y-12 built in the 1940s used for process develop-

ment. Use of NNSA's purchase authority for acquisitions allows us to accelerate delivery of modern facilities without the need for new construction.

To support our climate goals, NNSA placed lease orders with the General Services Administration to replace gas-powered cars with approximately 50 zero-emissions vehicles, nearly doubling the size of electric-powered cars in NNSA's fleet.

Nuclear Material Disposal and Reduction: NNSA converted an additional 91 kilograms of plutonium to an oxide form, for a cumulative total of 1,187 kilograms, in preparation for final disposition, continued downblending excess plutonium, and completed construction of a characterization and storage pad for the first shipment of downblended plutonium from the Savannah River Site to the Waste Isolation Pilot Plant. Additionally, the Secretaries of Energy and Health and Humans Services jointly certified that global supplies of molybdenum-99 (Mo-99) produced without the use of highly enriched uranium (HEU) can meet the needs of patients in the U.S. This critical milestone in nonproliferation efforts also triggered a congressionally mandated ban on exports of HEU for foreign medical isotope production.

Global Material Security: NNSA conducted over 75 cyber engagements with international partners to enhance security of nuclear facilities and materials. Partnerships were also started with several domestic advanced reactor vendors for 'security-by-design' activities to enhance the security of the systems for both domestic and international use. NNSA replaced 50 devices (39 domestically and 11 internationally) that use high-activity radioactive sources with non-radioisotopic alternative technologies and secured 48 buildings (28 domestically and 20 internationally) with high priority radioactive sources. In addition, since the start of 2021, NNSA has signed new counter radioactive material smuggling arrangements with Estonia's Ministry of Interior, Ukraine's Ministry of Internal Affairs, Ukraine's State Security Service, Mexico's National Commission for Nuclear Security and Safeguards, Niger's High Atomic Energy Authority, and Morocco's Gendarmerie.

Counterterrorism: NNSA's Nuclear Emergency Support Team (NEST) conducted dozens of operations, including preventative radiological/nuclear detection support to the Presidential Inauguration, Presidential Address to a Joint Session of Congress, New Year's Eve celebrations in Las Vegas and New York City, Super Bowl LV, the Fourth of July celebration on the National Mall, and the 76th Session of the United Nations General Assembly. Additionally, NNSA conducted 50 virtual workshops with U.S. public information officers, law enforcement, first responders, and technical experts concerning radiological counterterrorism to build capacity and improve crisis and risk communication.

Workforce Development: NNSA achieved its highest Federal workforce level since 2013 with a total of 1,825 Federal employees onboard. To help develop the next-generation workforce, NNSA awarded 13 Minority Serving Institution Partnership Program grants for a total of 24 consortia grants to reach tens of thousands of students in STEM disciplines.

NNSA'S FISCAL YEAR 2023 BUDGET REQUEST

The President's fiscal year 2023 budget request for NNSA is \$21.4 billion, an increase of \$1.0 billion, or 5.1 percent, over the fiscal year 2022 enacted level. Funding levels do not reflect the mandated transfer of \$92.75 million in fiscal year 2022 to the Office of Nuclear Energy for operation of the Advanced Test Reactor. This funding request reflects the expanded mission in NNSA and the need for accelerated delivery of the modernization and infrastructure programs. The three NNSA missions—the nuclear deterrent, nuclear security and nonproliferation, and naval nuclear propulsion—have key deliverables in fiscal year 2023. In addition, the capabilities to position NNSA to be successful in the future must be nurtured. We are grateful for the sustained, bipartisan commitment by Congress and multiple administrations and ask for continued support.

WEAPONS ACTIVITIES APPROPRIATION

The fiscal year 2023 budget request for the Weapons Activities account is \$16.5 billion, an increase of \$566 million, or 3.7 percent over the fiscal year 2022 enacted levels. The request will be supplemented with prior year balances of \$396 million. This budget request represents the Administration's continued strong commitment to a safe, secure, reliable, and effective nuclear deterrent backed by resilient, flexible infrastructure along with cutting edge science, cyber security, and physical protection.

NNSA is fully aware that delivering the deterrent and capabilities our nation needs to respond to the current environment requires a faster pace and a more complete modernization of weapons than over the last several decades. That is why we are re-establishing production capabilities lost in the 1990s and overhauling both

our physical infrastructure and human capital to retain technical advantages and build resilience into our enterprise. NNSA is looking forward to overcoming obstacles and building on the successes of the previous year.

The fiscal year 2023 request reflects the need to advance the weapons modernization programs and production capacity at an accelerated pace. The Weapons Activities account includes:

- Stockpile Management: Maintenance and modernization of nuclear weapons and production operations to sustain confidence in the safety, security, reliability, and military effectiveness of the stockpile without resuming nuclear explosive testing and associated activities.
- Production and Infrastructure Modernization: Investment in NNSA's infrastructure to rebuild capabilities lost in the 1990s and revitalize and expand the capacity of other elements to support stockpile modernization and science. These projects range from significant line-item construction for Plutonium and Uranium related activities to minor construction of offices and light labs to operational infrastructure such as electrical and networking utilities.
- Stockpile Research, Technology, and Engineering: Continued development of state-of-the-art scientific, engineering, and manufacturing capabilities to enable continuous improvement in design, certification, and production of the enduring nuclear weapons stockpile and to stay ahead of the threat.
- Transportation, Nuclear, and Cyber Security: Keeping pace with evolving threats and sustaining transportation, cyber and physical security across the nuclear security enterprise to improve resilience.

NNSA restructured the Weapons Activities budget in fiscal year 2021 to enable better alignment of portfolios with resources. This allowed improved prioritization within portfolios that have multiple programs and interdependencies. Further refinements are proposed in fiscal year 2023 to align programmatic construction with the portfolio each project supports. Comparisons throughout the Weapons Activities portfolio assume this alignment in the fiscal year 2022 enacted levels as well.

Stockpile Management

The fiscal year 2023 Stockpile Management budget request is \$4.9 billion, an increase of \$291 million, or 6.3 percent, over the fiscal year 2022 enacted level. This portfolio covers the maintenance of a safe, secure, reliable, and militarily effective nuclear weapons stockpile. Activities include life extension programs (LEP) and other weapons modernization activities; surveillance, minor alterations, and limited life component exchanges; providing the safe dismantlement of nuclear weapons and components; and providing sustainment of needed manufacturing capabilities and capacities. The fiscal year 2023 request also includes funding for Nuclear Enterprise Assurance (NEA) to prevent, detect, and mitigate subversion risks to the nuclear weapons stockpile and associated design, production, and testing capabilities.

W88 Alteration (Alt) 370: NNSA expects the W88 Alt 370 program to enter Phase 6.6, Full-Scale Production, in July 2022. Production is currently on schedule to meet DoD deployment schedules.

B61-12 LEP: NNSA expects the B61-12 LEP to enter Phase 6.6, Full-Scale Production, in June 2022. The B61-12 LEP consolidates multiple variants of the B61 gravity bomb and improves the safety and security of the weapon. Production is currently on schedule to meet DoD deployment schedules.

W80-4 LEP: NNSA is continuing Phase 6.3 activities, Development Engineering, and plans to enter Phase 6.4, Production Engineering, in fiscal year 2023. The W80-4 FPU date is currently being re-evaluated due to COVID-19 impacts, slower than planned hiring and increased attrition, and component technical challenges. The updated FPU schedule will be developed by mid-2022. NNSA's revised schedule is expected to support the U.S. Air Force's (USAF) schedule for Long Range Standoff missile initial operating capability.

W87-1 Modification Program: The W87-1 will replace the aging W78 warhead using a modification of the existing W87-0 design. The W87-1 will deploy new technologies that improve safety and security, address obsolete designs and materials, and simplify warhead manufacturability. The fiscal year 2023 budget request supports NNSA's commitment for a planned FPU in fiscal year 2030 to meet DoD's scheduled deployment of the Sentinel missile. The request supports Phase 6.3, Development Engineering, activities including joint testing with USAF Sentinel missile and Mk21A reentry vehicle program and conducting the Conceptual Design Review. NNSA plans to enter Phase 6.3 in fiscal year 2022.

W93/Mk7: In February 2022, the NWC voted to authorize the W93's entry into Phase 2, Feasibility Study and Design Options. NNSA's fiscal year 2023 funding request will support the Phase 2 activities including further examination of design concepts from Phase 1, and down-selection to desired weapon design(s) to be subse-

quently developed in Phase 2A, Design Definition and Cost Study, planned for fiscal year 2026. All the W93's key nuclear components will be based on currently deployed and previously tested nuclear designs, as well as extensive stockpile component and materials experience. It will not require additional nuclear explosive testing to certify. The W93 is vital for continuing our longstanding cooperation with the UK, which is modernizing its nuclear forces. The U.S.'s W93 program is a separate but parallel program critical to the UK's replacement warhead (RW) for its submarine launched ballistic missile. As an allied but independent nuclear power that contributes to NATO's nuclear deterrent posture, the UK's nuclear deterrent is critical to U.S. national security.

Within Stockpile Management, the fiscal year 2023 budget request includes \$1.3 billion for Stockpile Sustainment, an increase of \$141 million, or 11.9 percent above the fiscal year 2022 enacted level. This program is responsible for producing and replacing limited-life components such as neutron generators and gas transfer systems; conducting maintenance, surveillance, and evaluations to assess weapon reliability and detect any potential concerns; and analyzing information compiled during the annual assessment process.

The request for Stockpile Management also includes \$631 million for Production Operations, an increase of \$62 million, or 10.9 percent, above the fiscal year 2022 enacted level. Included in this request is funding to support continued growth of base capabilities, both in staffing and equipment, required to support increased LEP workload as certain programs reach full-scale production rates.

Production Modernization

The fiscal year 2023 Production Modernization budget request is \$4.64 billion, an increase of \$484 million, or 11.6 percent, over the fiscal year 2022 enacted level. This funding focuses on production capabilities for nuclear weapons components including primaries, canned subassemblies, radiation cases and non-nuclear components needed to sustain the nuclear weapons stockpile near-to long-term.

Primary Capability Modernization: NNSA's most intensive recapitalization effort is reconstitution of plutonium pit production fabrication capabilities. NNSA is required to produce no fewer than 80 pits per year (ppy) during 2030. NNSA has outlined a two-site approach for producing 80 ppy utilizing Los Alamos National Laboratory (LANL) to produce 30 ppy and the Savannah River Site (SRS) to produce 50 ppy. The two-site approach will provide the required capacity while enhancing resiliency and flexibility. At this time, the production of 30 ppy at LANL during 2026 remains on schedule with some technical challenges remaining. However, the production of 50 ppy at SRS during 2030 is not achievable. The Secretary of Energy and the Nuclear Weapons Council have both notified Congress regarding the inability to produce 80 ppy in 2030. However, NNSA remains committed to achieving 80 ppy as close to 2030 as possible. The fiscal year 2023 budget request funds pit production and associated efforts with a 26 percent increase compared to fiscal year 2022. NNSA continues to work with DoD to develop a plan to maintain the required stockpile until pit production capabilities are fully established.

The fiscal year 2023 request for LANL Plutonium Modernization will support equipment installation, continue decontamination and demolition work, and mature project design for the LAP4. This includes adding equipment in Plutonium Facility 4 (PF-4) to support 30 ppy in 2026, construction of a training facility to support workforce development, and construction of a higher capacity entrance control facility.

The fiscal year 2023 funds for SRPPF will be used to continue the CD-2 work to establish a 90 percent design. CD-2 is forecast for completion in early fiscal year 2024. Additionally, the request supports early site preparation including removal of unnecessary walls and building systems originally installed for the Mixed Oxide Fuel Fabrication Facility.

Secondary Capability Modernization: NNSA is also modernizing its uranium, lithium, and tritium processing efforts necessary to fabricate nuclear weapon secondaries. NNSA's uranium strategy aims to relocate enriched uranium processing capabilities into the UPF and other enduring facilities to reduce mission dependency on Building 9212, which is over 75 years old. This will be accomplished by completing construction of UPF to provide new floor space for high hazard operations; extending the operational lifetime of buildings 9215, 9204-2E, and 9995 into the 2040s; introducing new processes to increase safety and efficiency in the new facilities; and supplying the current stockpile with purified enriched uranium metal.

UPF will provide for the long-term viability, safety, and security of enriched uranium processing capability in the United States while significantly improving worker and public safety. The construction is well underway with a peak production workforce of 3,000 people in fiscal years 2022 and 2023. Ongoing supply chain issues

and delays associated with the COVID-19 pandemic are projected to result in a delay of about 8 months beyond the scheduled completion date of December 2025. A comprehensive annual cost update is being conducted for the UPF project completion to better understand factors that could potentially affect total costs. Overall, UPF is 70 percent complete with the first three non-nuclear infrastructure sub-projects completed under budget and on schedule.

Additionally, in fiscal year 2021, NNSA initiated the Depleted Uranium (DU) Modernization Program to meet growing mission requirements. This effort will reconstitute lapsed DU alloying and component manufacturing capabilities at Y-12; invest in key new technologies to improve efficiency and reduce lifecycle costs; and increase the reliability and capacity. The DU Modernization Program request for fiscal year 2023 is \$170 million.

The U.S. no longer maintains a full lithium purification capability and relies on direct recycling as the main source of lithium for nuclear weapons systems. NNSA's Lithium Strategy will increase the supply of lithium by recycling components from dismantled systems, sustain and recapitalize existing infrastructure through a transition period, and design and construct a Lithium Processing Facility (LPF) to house processing capabilities by 2031. LPF will replace capabilities performed in Y-12's buildings 9204-2 and 9202 and will include recovery, purification, and component fabrication operations. While current capabilities can provide a sufficient lithium supply through 2035, operations take place in an aging facility with significant infrastructure challenges. LPF will alleviate those issues and reduce risk while providing capacity to meet material demands beyond 2035.

The fiscal year 2023 budget request for the Tritium and Domestic Uranium Enrichment is \$580 million, an increase of \$64 million, or 12.4 percent above the fiscal year 2022 enacted level. For Domestic Uranium Enrichment the fiscal year 2023 budget request supports HEU down-blending to extend the need date for low-enriched uranium (LEU) for tritium production to 2044, enrichment technology development, and acquisition activities to meet future enriched uranium needs. HEU downblending began in fiscal year 2019 and will continue through fiscal year 2025. NNSA is currently conducting an analysis of alternatives, which is expected to conclude in the mid-2020s that will inform a final down-select of an enrichment options. Other NNSA programs such as reactor fuel and naval propulsion fuel are also supported by this effort.

The Tritium Modernization Program's mission is to establish and operate a domestic source of tritium to meet national security requirements, which includes recycling tritium gas to maintain required inventories and sustaining reliable supply chain infrastructure and equipment. Since 2003, NNSA's tritium production has met all production, delivery, and schedule requirements. Because NNSA is currently ramping up production levels at the Tennessee Valley Authority to meet future delivery requirements, the requested budget has been increased. NNSA is also in the early phases of constructing the Tritium Finishing Facility (TFF), which will replace a 1950s-era facility. TFF will house the finishing, packing, and shipping of gas reservoirs to meet mission requirements. This major infrastructure modernization initiative will fulfill a critical mission need and enable the program to meet contemporary safety standards. The facility will house functions to receive, inspect, finish, package, and ship reservoirs. Construction of the site preparation subproject is scheduled to start in fiscal year 2024.

Non-Nuclear Component Modernization: Non-nuclear components (NNCs) include a wide array of parts that weaponize the nuclear explosive package. Examples are gas transfer systems, neutron generators, microelectronics, and power sources. NNCs make up more than half the cost of weapon modernization due to the number, complexity, and their qualification in extreme environments over the warhead lifecycle. Therefore, delivering NNCs requires an extensive foundation of capabilities for the design, development, qualification, production, and surveillance of these components. The fiscal year 2023 request includes funding to provide equipment for increased manufacturing capacity at the Kansas City National Security Campus; reconstitute thermal spray capability for weapon modernization; recapitalize radiation and major environmental test facilities at Sandia National Laboratories used to design and qualify NNCs; and tools and equipment at the Microsystems Engineering, Science and Applications (MESA) Complex at Sandia, which serves as the only approved source of trusted, strategically radiation hardened microelectronics.

Infrastructure and Operations

NNSA has been taking significant steps to modernize and recapitalize its infrastructure to meet expanding demands, reduce mission and safety risk, and draw down its deferred maintenance backlog. A well-organized, well-maintained, and modern infrastructure system is the bedrock of a flexible and resilient nuclear en-

terprise. Almost 60 percent of NNSA facilities were beyond their 40-year life expectancy at the end of fiscal year 2021 with some dating back to the Manhattan Project. Our modernization and recapitalization efforts will provide for the safety of our workforce, the communities around our facilities, and our environment. NNSA can address this challenge only with sustained, predictable, and timely funding.

The fiscal year 2023 budget request for Infrastructure and Operations is \$2.63 billion, an increase of \$144 million or 5.8 percent over the fiscal year 2022 enacted amount. This increase will enable NNSA to build on the Infrastructure Modernization Initiative, including adopting new practices that will streamline construction practices to save time and money on low-risk, non-nuclear, construction projects.

Deferred maintenance has been a key focus of both NNSA and Congress. At the end of fiscal year 2021, NNSA had \$6.1 billion of deferred maintenance and an enterprise-wide replacement plant value of \$121.5 billion. While this ratio may seem high, construction of new facilities and associated demolition of legacy facilities will have a substantial role in reducing NNSA infrastructure challenges. Approximately 90 percent of NNSA deferred maintenance is associated with facilities that are approaching or have surpassed their intended design life. NNSA is integrating its infrastructure modernization work with the Department's Office of Environmental Management supported effort to demolish high-risk excess facilities at the Y-12 National Security Complex, Lawrence Livermore National Lab, and Los Alamos National Lab. NNSA is using this intentional approach to prioritize investments based on mission risk while underscoring the need for sustained commitment to move beyond legacy infrastructure. The fiscal year 2023 budget request includes increases in Mission Enabling Construction accounts so that NNSA can address mission needs, achieve operational efficiencies, and reduce risks to safety, security, the environment, and program.

For years, NNSA has used a prioritization methodology for recapitalization investments that factors in sustainability and resilience along with safety and mission risk. In fiscal year 2023, NNSA is increasing its emphasis on climate resiliency projects through the Energy Resilient Infrastructure and Climate Adaptation (ERICA) initiative. ERICA is part of NNSA's multifaceted approach to address climate adaptation and resilience using direct- and indirect-funded infrastructure programs and alternative financing. For example, the planned Building 848 Net Zero Energy Upgrade project at Sandia will move the facility to being 100 percent powered by on-site generated electricity while also improving its operations, indoor air quality, and thermal comfort.

NNSA uses data-driven, risk informed tools and initiatives to improve decision-making, accelerate the delivery, and reduce the cost of commercial-like construction projects. For example, in fiscal year 2019 NNSA established the Enhanced Minor Construction & Commercial Standards (EMC2) pilot, which is challenging the paradigm for how NNSA executes low-risk, non-complex construction projects to accelerate delivery and reduce costs. There are 10 projects in the pilot, including the Lawrence Livermore National Laboratory's Emergency Operations Center (EOC) which is the first pilot project to be completed earlier this year. Using the EMC2 approach, the Livermore EOC was completed 13 months after receiving full construction funding in January 2021. In the first four pilot projects currently underway, estimated cost savings range from approximately 12 to 31 percent. An additional six EMC2 projects are projected to result in estimated cost savings of 17 to 38 percent.

Stockpile Research, Technology and Engineering

For Stockpile Research, Technology, and Engineering, the fiscal year 2023 budget request is \$2.89 billion, a decrease of \$83 million, or 2.8 percent below the fiscal year 2022 enacted level. The decrease results from the use of carryover balances to continue construction of the U1a Complex Enhancement Project at the Nevada National Security Site (NNSS). After adjusting for this reduction, the Stockpile Research, Technology, and Engineering request is stable from fiscal year 2022 enacted.

This portfolio provides the scientific foundation for science-based stockpile activities, including the capabilities, tools, and components needed to assess the active stockpile and to certify warhead modernization programs without the need for underground nuclear testing. NNSA's unparalleled science and technical capabilities, and commitment to their constant improvement, helps cultivate the knowledge and expertise to maintain confidence in the stockpile. The major activities in the Stockpile Research, Technology, and Engineering portfolio are:

Enhanced Capabilities for Subcritical Experiments (ECSE): ECSE will produce experimental data in underground tunnels at the NNSS that will enable high fidelity assessment of the current stockpile and certification of the future stockpile without the need to return to underground nuclear-explosive testing. ECSE experiments are

designed to remain subcritical throughout the experiment to adhere to the U.S. policy of “zero yield.”

Stockpile Responsiveness Program (SRP): SRP is responsible for exercising and enhancing capabilities across the entire nuclear weapons development and production process to improve the responsiveness of the United States to future threats, technology trends, and international developments not addressed by existing life extension programs. For example, SRP is investing in efforts to address issues in design for manufacturability, digital engineering, component, and system prototyping and testing.

Inertial Confinement Fusion (ICF) Program: The ICF Program supports the assessment and certification of the nuclear weapon stockpile by providing the facilities, scientific expertise, and experimental capability necessary to acquire data at the extreme conditions of nuclear weapon operation. The ICF program also supports research on thermonuclear fusion with the goal of reaching fusion ignition and eventually high fusion yield in the laboratory. The fiscal year 2023 request supports ICF research and facilities, enabling access to experimental data that underpin the safety, security, and effectiveness of the nuclear stockpile and continued progress toward the capabilities necessary to meet long-term stewardship needs.

NNSA Exascale Computing Initiative: The Exascale Computing Initiative (ECI) will provide NNSA with next-generation simulation capabilities to support weapons design, science-based stockpile stewardship, and stockpile certification activities. The fiscal year 2023 budget request will continue funding maturation of next-generation simulation and computing technologies and enables NNSA to meet its exascale system initial operation capability in fiscal year 2023, including transition of the next-generation, validated weapons codes to next-generation classified computing.

Academic Programs: The challenges of sustaining the nuclear deterrent long-term demand a strong and diverse base of national expertise and educational opportunities in specialized technical areas that uniquely contribute to stockpile stewardship. NNSA’s Academic Programs are designed to cultivate, attract, and retain such a workforce. Funding in this area supports the Administration’s Executive Order on Advancing Racial Equity and Support for Underserved Communities through the Federal Government, Academic Alliances and existing partnerships with Minority Serving Institutions, and an increase in student engagement and internship opportunities.

Secure Transportation Asset

Secure Transportation Asset (STA) supports the safe, secure transport of the Nation’s nuclear weapons, weapon components, and special nuclear material throughout the nuclear security enterprise to meet nuclear security requirements. Nuclear weapon life extension programs, limited-life component exchanges, surveillance, dismantlement, nonproliferation activities, and experimental programs rely on STA to ensure safe, secure, and on-schedule transport. The fiscal year 2023 budget request for STA is \$344 million, an increase of \$13.7 million, or 4.1 percent, above the fiscal year 2022 enacted amount to increase the Federal Agent workforce to a level necessary to keep pace with the growing program deliverables.

The Office of Secure Transportation’s (OST) priorities for fiscal year 2023 include modernization and sustainment of transportation assets. This includes the Safeguards Transporter (SGT) life extension program to secure its service until replacement by the Mobile Guardian Transporter (MGT), as well as the entry into service of procured 737–700 aircraft. The first MGT Production Unit is planned for completion in fiscal year 2026 and initial rate production is set to commence in fiscal year 2027. Currently, aircraft are undergoing heavy maintenance checks, painting to NNSA standards, and a major modification from a passenger jet to a FlexCombi that is configurable to carry various loads of personnel and cargo.

OST also remains focused on recruiting, stabilizing, training, and retaining the Federal Agent and staff workforce necessary to support mission requirements. OST has committed to a stable human resources strategy to achieve an optimal agent force. OST has increased staffing numbers by optimizing position qualifications and managing risk associated with the Human Reliability Program. Although COVID–19 impacted key milestones and deliverables, OST successfully accomplished every assigned mission for the previous year.

Defense Nuclear Security

Defense Nuclear Security’s fiscal year 2023 budget request is \$882.3 million, an increase of \$38.2 million, or 4.5 percent over the fiscal year 2022 enacted level. The Office of Defense Nuclear Security’s (DNS) primary mission is protecting the facilities, people, and assets critical to achieving NNSA’s important national security

missions. The need for increasing security due to growth across enterprise from projects such as LAP4 and UPF, along with additional resources required to sustain core security, has resulted in increased program requirements for DNS. Support for the request is vital for the protection of the enterprise, its people, and its sensitive material and information. DNS remains focused on improving physical security infrastructure with several new projects and the development and deployment of new systems. Progress is also being made in countering unmanned aircraft systems. The first such platform was deployed at LANL in December 2017. Deployment at other facilities is expected to be completed in late fiscal year 2022.

Cybersecurity and Emerging Issues

The fiscal year 2023 budget request for information technology and cybersecurity is \$445.7 million, \$39.1 million, or 9.6 percent, over the fiscal year 2022 enacted amount. This request funds ongoing operations and invests in improvements across NNSA to modernize both classified and unclassified systems, improves information management and data governance, implements critical aspects of a zero-trust architecture in our networks and systems, and allows for the execution of a robust cybersecurity program. As an example, NNSA recently recapitalized its deployed cyber sensor platform, significantly improving the ability to detect and respond to malicious activity.

Maintaining a strong cybersecurity program is a critical defense mechanism and a powerful deterrence tool. To strengthen oversight of the cyber program, the budget request includes a recategorization of certain Cybersecurity program investments into the Information Technology program. As a result, the request more clearly reflects investments in cybersecurity tools and services provided to the enterprise, maintains core cyber operations at the labs, plants, and sites, and improves management and transparency of these funds.

NNSA also recently completed an enterprise-wide cybersecurity assessment, in conjunction with the Institute for Defense Analyses, aimed at evaluating the overall cybersecurity posture and developing a set of recommendations to improve the program. That review calls for increased investment in information technology and cyber infrastructure to better meet current and emerging challenges, as well as outlines strategies related to workforce development issues. NNSA has already started acting on the findings and will continue to do so with the fiscal year 2023 requested budget.

DEFENSE NUCLEAR NONPROLIFERATION APPROPRIATION

The fiscal year 2023 budget request for the Defense Nuclear Nonproliferation account is \$2.3 billion, an increase of \$274 million, or 13.2 percent, over the fiscal year 2022 enacted level. When the use of prior year balances is considered, the proposed funding level for the account increases by \$397 million, or 19.2 percent. The use of prior year balances will allow DNN programs to supplement new budget authority across its programs.

This account funds all activities in the offices of Defense Nuclear Nonproliferation, Emergency Operations, and Counterterrorism and Counterproliferation. Within these offices, this appropriation funds six nonproliferation programs, a counterterrorism and counterproliferation program, and an incident response program as part of a whole-of-government approach. Together these efforts provide policy and technical leadership to prevent or limit the spread of weapons of mass destruction (WMD) and the related materials, technology, and expertise as well as to detect and respond to nuclear terrorism or proliferation events.

Nonproliferation Efforts

For decades, Defense Nuclear Nonproliferation (DNN) has developed and implemented policy and technical solutions to eliminate proliferation sensitive material and limit or prevent the spread of materials, technology, and expertise necessary for nuclear and radiological weapons. By working with governments, international organizations, and private sector partners around the world these efforts reduce the reliance on radioactive material in commercial and research industries; better secure nuclear and radioactive material; develop capabilities to interdict material outside of regulatory control; and maintain a robust response capability for nuclear and radiological incidents at home and abroad.

The fiscal year 2023 budget request will allow the Office of Defense Nuclear Nonproliferation to better confront current and anticipated proliferation challenges including the growing nuclear programs and strategic competition with Russia and China, the impacts of Russia's full-scale invasion of Ukraine, risks related to the North Korean and Iranian nuclear programs, and disruptive technologies that lower the barrier to proliferation. Through these efforts DNN aims to restore American

leadership in nonproliferation solutions and cutting-edge technology required to address future threats.

The Material Management and Minimization (M3) program fiscal year 2023 budget request is \$451 million, an increase of \$108 million, or 31.5 percent, over the fiscal year 2022 enacted level. M3 programs reduce and, when possible, eliminate weapons-usable nuclear material around the world. The fiscal year 2023 budget request supports the conversion or shutdown of research reactors and isotope production facilities that use HEU, the use of non-HEU-based Mo-99 production, the removal and disposal of weapons-usable nuclear material, and the removal of plutonium from the State of South Carolina. Additionally, to date, nearly 7,270 kilograms of weapons-usable nuclear material from 48 countries and Taiwan have been removed or confirmed disposed, while 108 civilian research reactors and isotope production facilities have stopped using weapons-grade material in their work.

The Global Material Security program fiscal year 2023 budget request is \$504 million, a decrease of \$27.4 million, or 5.1 percent, below the fiscal year 2022 enacted level. The fiscal year 2023 request supports program efforts to prevent terrorists and other actors from obtaining nuclear and radioactive material for use in an improvised nuclear device by working with domestic and global partners. This includes improving the security of vulnerable materials and sites, promoting the adoption of alternative technologies that do not rely on radioactive sources, and increasing capacity to detect, disrupt and interdict illicit trafficking operations. Working through the RadSecure 100 Initiative, NNSA will accelerate and expand permanent risk reduction, security enhancements, and response integration with local law enforcement in the top 100 major metropolitan areas of the United States. To date, NNSA has replaced approximately 130 cesium-137 based blood irradiators with alternative technologies. The program remains on track to replace nearly all the estimated 400 such devices in the United States by 2027 as mandated in the fiscal year 2019 NDAA. In addition, NNSA is partnering with domestic advanced nuclear reactor vendors in 'security-by-design' activities to enhance the security of their systems for domestic and international use. Finally, NNSA continues to build additional partnerships with bilateral and multilateral partners focused on counter nuclear smuggling. To date, NNSA partners with 84 countries in this area and continues to expand cooperation with existing and new partners to expand global counter nuclear smuggling capabilities.

The Nonproliferation and Arms Control (NPAC) program fiscal year 2023 budget request is \$208 million, an increase of \$23 million, or 12.4 percent, above the fiscal year 2022 enacted level. The increased funding request supports two increasingly important activities: (1) policy and technology development activities for peaceful uses of nuclear energy along with support for the International Atomic Energy Agency (IAEA), and (2) policy and technology development for potential arms control agreements that extend to new types of strategic weapons as well as tactical nuclear weapons.

By focusing on ensuring the peaceful use of nuclear energy, NPAC programs strengthen nonproliferation regimes through the development and implementation of effective technologies and policies. This is especially important as nuclear energy programs expand internationally in response to clean energy implementation to address climate change. New nuclear safeguards and monitoring and verification technologies are needed to secure materials and to detect proliferation activities early. NPAC works to mature technologies and transfer them to the International Atomic Energy Agency (IAEA) and partner countries to implement. The U.S. also supplies IAEA with U.S. subject matter experts, training, and equipment advice and procurement aid. In fiscal year 2022 and fiscal year 2023 NPAC is helping establish the nonproliferation enrichment testing and training platform. This platform will be turned over to the IAEA for commissioning and operation in fiscal year 2024. On the policy side, NPAC supports the development and implementation of Section 123 agreements and the careful regulation of nuclear technology exports utilizing Part 810 Authorizations.

Approximately \$30 million funds increasing nuclear weapons verification activities. This will improve U.S. technical policy and readiness for future arms control agreements and associated verification technology. New investment in the Arms Control Advancement Initiative will strengthen NNSA's capacity to address future nuclear warhead monitoring and verification requirements through advanced technology development, robust modeling and measurements, and sustained expert engagement to maintain a pipeline of experts to help advance arms control objectives over time.

The Defense Nuclear Nonproliferation Research and Development (DNN R&D) program fiscal year 2023 budget request is \$720 million, a decrease of \$9 million, or 1.2 percent, below the fiscal year 2022 enacted level. DNN R&D is the key compo-

ment for the innovation of United States' technical capabilities to detect nuclear detonations; foreign nuclear weapons programs' activities; and the presence, movement, or diversion of special nuclear materials. The program also sustains and develops foundational nonproliferation technical competencies that ensure the technical agility needed to support a broad spectrum of U.S. nonproliferation missions and anticipate threats. Consistent with the growing nonproliferation challenges, this funding request for DNN R&D programs will expand activities that advance the development of next-generation nuclear arms control monitoring and verification technology and expertise symbiotic with the NPAC efforts.

The Nonproliferation Construction program fiscal year 2023 budget request is \$72 million, a decrease of \$84 million, or 54 percent, below the fiscal year 2022 enacted level. This decrease is due to the awarding of the long-lead procurement contracts for gloveboxes, emergency generators and HEPA filters under CD-3A Phase 2 in fiscal year 2022 and the expected fiscal year 2023 completion of design work for the Surplus Plutonium Disposition (SPD) project required for CD-2/3, Approval of Performance Baseline and Start of Construction. The fiscal year 2023 budget request supports the implementation of the dilute and dispose strategy, by continuing design for the SPD project. The SPD project will add additional glovebox capacity at the SRS to accelerate plutonium dilution and aid in the removal of plutonium from South Carolina.

NNSA is requesting the establishment of a Bioassurance Program in fiscal year 2023. The budget request is \$20 million. As the COVID-19 pandemic has shown, the United States needs better capabilities to anticipate, respond to, and mitigate threats to the bioeconomy. NNSA proposes to establish a national security bioassurance program to perform activities to anticipate and detect threats and scale response solutions to support the security of the future bioeconomy and monitor and thwart malpractice in this area. This funding supports foundational work at DOE/NNSA laboratories including the anticipation of destabilizing threats through modeling, identifying threat signatures and developing detection technologies, and rapidly developing and validating safeguards and threat mitigation approaches. NNSA will integrate its high-security work with the Department's Office of Science supported "open" science work and other government agencies, providing the full spectrum of capabilities essential for a bioassurance program informed by national security expertise drawn from parallel and analogous work on nuclear threats, risks, export controls and licensing, nonproliferation, detection, and verification.

Nuclear Counterterrorism and Incident Response

The fiscal year 2023 request for the Nuclear Counterterrorism and Incident Response (NCTIR) program is \$439 million, an increase of \$68 million, or 18.4 percent, over the fiscal year 2022 enacted amount. The NCTIR program supports two subprograms: Counterterrorism and Counterproliferation (CTCP) and Emergency Operations (EO).

CTCP is responsible for countering nuclear terrorism and nuclear proliferation, responding to nuclear incidents and accidents worldwide, advancing nuclear forensic capabilities, and building domestic and international partner capacity concerning emergency preparedness and response. CTCP's unique scientific and operational capabilities make it an integral part of the U.S. Government's layered defense against nuclear terrorism and nuclear proliferation.

CTCP manages the NEST, NNSA's multi-mission emergency response capability comprised of on-call technical specialists who are trained and equipped to respond to nuclear incidents and accidents worldwide. NEST's missions include both national security and public health and safety disciplines.

NNSA, in conjunction with the Federal Bureau of Investigation (FBI), supports regional counter-WMD teams in 14 major U.S. cities as part of the "Capability Forward" initiative. CTCP provides technology, equipment, and training in support of these teams to enhance regional capabilities to defeat nuclear and radiological devices, accelerating life-saving responses to a WMD event.

The fiscal year 2023 budget request addresses critical shortfalls in CTCP's capabilities to execute DOE's Primary Mission Essential Function (PMEF)-2, Respond to Nuclear Incidents. In coordination with interagency efforts to identify and address WMD response gaps, increased funding addresses staffing needs, ensures operational integration and full-spectrum training and exercises in accordance with interagency objectives, and supports technology development and infrastructure requirements.

Additional programmatic funding will also invest in new incident response expertise and technology; continue NEST equipment recapitalization efforts with planned procurement for replacement of diagnostic equipment and detection systems required for the public health and safety, counter-WMD, and nuclear weapon accident

response mission areas; and bolster CTCP efforts to counter nuclear proliferation through applied analysis, concept development, predictive modeling, and testing.

CTCP also contributes to the interagency National Technical Nuclear Forensics mission, a central pillar of the U.S. strategy to deter hostile States from providing nuclear material to terrorists. CTCP's fiscal year 2023 budget request includes \$43 million for this effort, including training and exercises for responders; procurement, maintenance, logistics, and technical integration of equipment; readiness to deploy pre- and post-detonation response and device assessment teams; and laboratory analysis of nuclear or radiological material.

EO provides both the structure and processes to ensure a comprehensive and integrated approach to all-hazards emergency management, thus improving readiness and effectiveness of the DOE Emergency Management System on a programmatic and performance level regardless of the nature of the emergency impacting the DOE/NNSA enterprise or its equities anywhere in the world. The fiscal year 2023 budget request supports Continuity of Operations, Continuity of Government, and Enduring Constitutional Government programs to advance the National Continuity Policy and ensure the continued performance and delivery of essential services under any circumstances. The fiscal year 2023 budget request also provides for 24/7/365 Consolidated Emergency Operations Center communications and coordination support to the DOE/NNSA Emergency Management Enterprise and Departmental Senior Leadership. The request also includes funding for investments in communications equipment and classified communications system improvements to support emergency operations and continuity infrastructure improvements.

NAVAL REACTORS APPROPRIATION

Advancing Naval Nuclear Propulsion

With over 40 percent of the Navy's major combatants being nuclear-powered, this technology remains critical to our national security posture. It provides the nation's submarines and aircraft carriers with unmatched mobility, flexibility, responsiveness, and endurance. The ability to maintain robust fleet capabilities on long-term missions is essential for the security of global trade and the security of our allies. The Office of Naval Reactors is the foundation of this national achievement in global security. Cutting edge advancements across all aspects of the Naval Nuclear Propulsion Program, from reactor plant development and design to the disposition of spent fuel, gives the U.S. Navy a decisive edge in naval warfare and enhances the security and reliability of the sea-leg of our nuclear triad.

The fiscal year 2023 budget request for Naval Reactors is \$2.08 billion, an increase of \$163 million, or 8.5 percent, above the fiscal year 2022 enacted level. The funding does not reflect the mandated transfer of \$92.75 million in fiscal year 2022 to the Office of Nuclear Energy for operation of the Advanced Test Reactor. The budget request supports the continued safe and reliable operation of the nuclear-powered fleet, and it supports investment in technology development to deliver improvements in propulsion plant performance, manufacturability, and affordability—for current and future warships. Funding also supports requirements for the office's three major projects: *COLUMBIA*-class ballistic missile submarine reactor systems development; construction of the Naval Spent Fuel Handling Facility in Idaho; and the refueling and overhaul of the S8G Prototype land-based reactor in New York for continued sailor training and technology testing.

Consistent, sustained funding is vital for the support of these projects and will allow Naval Reactors to meet current and future force needs. Close coordination with the Navy led to the start of construction of the *COLUMBIA*-class lead ship in fiscal year 2021. The S8G Refueling Overhaul is expected to reach completion in fiscal year 2023. The Spent Fuel Handling Recapitalization project at the Naval Reactors Facility in Idaho is making significant progress with an estimated completion in fiscal year 2026.

AUKUS

On September 15, 2021, Australia, the UK, and the U.S. announced the creation of an enhanced trilateral security partnership (AUKUS), focused on peace and security in the Indo-Pacific region. The three governments are currently 6 months into an 18-month consultation period to establish the most efficient path forward for the delivery of a nuclear-powered, conventional, submarine capability to Australia as expeditiously as possible. As part of the international working group developing non-proliferation and safeguards aspects of the AUKUS program, NNSA will provide technical advice to the interagency and our AUKUS partners on the full suite of requirements that underpin nuclear stewardship to implement strong safeguards measures and achieve the AUKUS objectives.

This cooperation is fully consistent with our obligations under the Nuclear Non-proliferation Treaty (NPT). The NPT does not prohibit naval nuclear propulsion. In our role in this trilateral partnership, we intend to implement the strongest possible nonproliferation standards to maintain the strength and integrity of the nuclear nonproliferation regime. Australia is not seeking, and the U.S. and UK are not and will not assist in any acquisition of nuclear weapons. Additionally, Australia has committed not to enrich uranium or reprocess spent fuel in the context of AUKUS.

FEDERAL SALARIES AND EXPENSES APPROPRIATION

The fiscal year 2023 budget request for Federal Salaries and Expenses (FSE) is \$496 million, an increase of \$32 million, or 7 percent, above the fiscal year 2022 enacted level. The increase in this account will support an additional 132 Federal Full-time Equivalents (FTE) above the fiscal year 2022 enacted level, bringing the total to 1,958. FSE increases will also support increased space and occupancy needs, travel costs, support service contractors, training, and other related expenses.

The NNSA Federal workforce is critical to the success of the Nation's nuclear security enterprise. NNSA's expanding mission requirements and pressing modernization and recapitalization needs require recruiting, training, and retaining a skilled Federal workforce with the appropriate capabilities to meet mission requirements and deliver on our objectives. This workforce represents some of the top minds on nuclear issues, consisting of a diverse team of scientists, engineers, project and program managers, foreign affairs specialists, and support staff that perform program and project management and conduct appropriate oversight of national security missions. NNSA's Federal workforce is distributed across the enterprise and can be found in eight States and Washington, DC.

NNSA currently faces two significant hurdles in achieving full staffing: retirement and private sector competition. As of fiscal year 2021 17.3 percent of NNSA FTE Federal staff are eligible to retire, a number that is expected to rise to 35.4 percent by fiscal year 2027. Additionally, in fiscal year 2021 the annual FSE attrition rate was 10.7 percent, higher than the average attrition rate of 8.9 percent over the past 13 years. NNSA also faces competition from the private sector for top talent in technical fields.

Combating these trends requires an aggressive, external hiring strategy. NNSA has utilized a renewed focus on virtual recruitment events that support hiring across the nuclear security enterprise in support of all program areas. In October 2021, NNSA initiated a pilot program for expedited hiring within 15 business days, from the time the program office selected a candidate to the time Human Resources provided an entry on duty date. NNSA is applying lessons learned from this pilot program to continue progress on a streamlined hiring effort. Finally, NNSA has expanded the effort to enlarge fellowship program candidate pools and employ available alternative hiring authorities to compress the hiring timeline for qualified candidates and increase the overall hiring rate.

NNSA's recruitment and hiring efforts will support mission and growth requirements and will continue to support the Administration's goals of promoting racial and economic equity as a way to foster scientific breakthroughs, research and development excellence, and enhanced national security.

CONCLUSION

NNSA's enduring responsibility is providing the United States with a nuclear weapons stockpile and naval nuclear propulsion systems that are the best in the world while simultaneously promoting nonproliferation and counterterrorism efforts to reduce overall nuclear risk. The President's fiscal year 2023 budget, informed by the 2022 Nuclear Posture Review, supports our efforts to keep the nuclear deterrent and naval nuclear propulsion systems safe, secure, reliable, and militarily effective. Recognizing the increasingly volatile geopolitical environment, NNSA must also stay resolute in sustaining and evolving our nuclear security, non-proliferation, and counterterrorism efforts to help offset and stay ahead of nuclear risks.

NNSA has a unique responsibility to provide an effective nuclear deterrent in a timely manner to protect our Nation and our allies. The fiscal year 2023 budget request funds the five life extension and modernization programs that support all three legs of the triad. In fiscal year 2023 the requested budget also supports significant investments in new production facilities for uranium processing and plutonium pit manufacturing at the fastest responsible pace. The budget request contains close to equal funding for stockpile management and production modernization, a true indication of the intent to accelerate activities by working on weapon design and production in parallel with infrastructure revitalization. The science and engineering support for the weapons program stays strong to allow for the continued develop-

ment of capabilities to design and certify the stockpile without testing and to stay ahead of threats.

The Defense Nuclear Nonproliferation budget request sustains our efforts to reduce nuclear risk by eliminating, minimizing, and securing nuclear and radiological materials. In addition, the DNN portfolio request recognizes the changing world by increasing support for policy and technology development aimed at the increased proliferation risks associated with the increase in nuclear energy around the world, preparing for an increasingly complex arms control and global stability environment, and by initiating a bioassurance program. Similarly, the increased budget request for the counterterrorism and counterproliferation program is responsive to the changing threat environment.

The Naval Reactors budget request recognizes the excellent stewardship provided over the years and continues to support the high priority needs to replace aging tools, build a new spent fuel handling facility, and support the *COLUMBIA*-class production schedule.

The challenges NNSA faces ahead are steep and we are mindful of the resources entrusted to it. For fiscal year 2023, NNSA scrubbed prior year balances and used available funds to offset some of the increased budget needs. NNSA, in partnership with Congress and our colleagues in the Departments of Energy and Defense, is steadfast in our commitment to fulfill vital national security mission and deliver our goals. We greatly appreciate your support.

PREPARED STATEMENT OF ADMIRAL JAMES F. CALDWELL

Chairman Feinstein, Ranking Member Kennedy, and distinguished members of the subcommittee, thank you for the opportunity to appear before you today and present the President's fiscal year 2023 budget for Naval Reactors. Your strong support for the work we do ensures our nuclear Navy can carry out vital missions around the world with agility, endurance, and firepower. As underscored by the unprecedented events currently playing out on the world stage, great power competition is here to stay, therefore it is vital for the United States that we maintain a robust naval advantage over our adversaries. Congress' support of our past efforts has allowed the Navy to maintain these advantages, and your partnership with the Navy is needed now, more than ever, as we work on the current and future endeavors in naval nuclear propulsion that are needed to protect the national security of the United States.

I have had the pleasure of serving as the Director of Naval Reactors for almost 7 years out of an eight-year tenure. Before that, I had the privilege of serving in many operational and staff roles throughout the course of my Navy career. As I reflect on these decades of service and our Navy's global standing, I am increasingly concerned that our competitive advantages over our near-peer rivals are diminishing. It is vitally important for us to focus on technology investment now; failure to do so could have catastrophic implications for our future Navy in a future fight. Rivals are pursuing military modernization programs aimed at achieving regional hegemony in the near-term and eroding United States preeminence in the long-term. All domains of the maritime environment are becoming increasingly contested, and to preserve freedom of the seas, deter conflict, defend allies, and protect our national interests, we must sustain and grow our naval warfighting capabilities at an accelerated pace.

As amplified in our latest National Defense Strategy, we cannot simply do more of what we've done in the past. New advancements and refinements in nuclear propulsion are needed as the Navy innovates to increase and expand our competitive advantage. Naval Reactors' historical investment in advanced technologies has given the nation an enviable position in the maritime environment; further investments, however, are necessary to maintain our technological edge well into the future. Our ships need to retain their advantage against future threats across multiple domains and must be affordable. We also need to be able to design and build our propulsion plants faster to ensure the Navy stays ahead of increasing demands, and we must do this more cost effectively. As the CNO has conveyed in his Navigation Plan, "there is no time to waste—our actions in this decade will set the maritime balance of power for the rest of the century." Our nation took a new step this past year when the President announced the AUKUS enhanced tri-lateral security partnership, directing a period of consultation with the objective of identifying the optimal pathway for delivering a conventionally-armed, nuclear-powered submarine capability to Australia by the earliest achievable date. This partnership creates an opportunity to amplify our naval power, strengthen a key ally and our own ship-building capability, and build the additional industrial and vendor base capacity our Nation needs. Through the consultation period, Naval Reactors is also focused on

strengthening our partnership with the United Kingdom, and ensuring Australia understands and establishes the strong foundation of capabilities necessary to properly steward nuclear submarine technology. Given the global threats we face, it is imperative that we ensure our closest allies remain relevant in the undersea domain.

Our success in the future will rest on the foundation of what we build today. Therefore, I want to highlight some of the many contributions of our nuclear fleet. Our ballistic missile submarines provide the most survivable leg of our nuclear triad and are essential to our ability to deter major warfare, and provide assurance to our allies. Our fast attack submarines operate with confidence, undetected, safeguarding vital commercial sea-lanes, and stand ready to protect American interests where needed. Our aircraft carriers provide our nation a credible, sustained ability to project combat power, deter conflict, and protect our interests around the world.

Lead ship construction for *COLUMBIA* Class is underway, which will allow the Navy to continue the seamless execution of the sea-based strategic deterrent mission that began over six decades ago. The USS *OHIO* (SSBN 726), lead ship of today's ballistic missile submarine fleet was commissioned over 40 years ago. This class will start to be replaced by the *COLUMBIA* Class in 2031 with lead boat delivery in fiscal year 2028. I remain focused on ensuring the transition between these two classes is uninterrupted—the sea based strategic deterrence mission is too important to fail. The *COLUMBIA* Class will be a bedrock of our national security posture for decades to come and will be the first submarine to operate for over 40 years on a single reactor core, an incredible testimonial to the technology investment that has occurred over the past decades.

In attack submarine shipbuilding, the Navy continues to work toward a steady cadence of *VIRGINIA* Class submarine delivery. I recently took part in sea trials on Pre-Commissioning Units (PCU) *MONTANA* and *OREGON*. This submarine class now makes up over one third of our operational attack submarines. The Navy is also assessing improvements to capability and lethality for future *VIRGINIA* Class submarines; these improvements will not only add capability to today's fleet but allow the Navy to prove candidate technologies that will influence our next-generation attack submarine. Naval Reactors is closely aligned with the Navy on all of these efforts. Along with the technologies being inserted for *VIRGINIA* Class submarines, Naval Reactors has renewed our focus and investment in advanced technologies which will pave the way for improvements in speed, energy density, and stealth for the follow on SSN(X) program. We are also focused on refueling up to seven *LOS ANGELES* Class submarines, helping to maintain our submarine force structure with boats that have the warfighting capability to contribute effectively to undersea missions.

In aircraft carrier shipbuilding, USS *GERALD R. FORD* (CVN 78) continues to make great progress and will soon be employed and operating alongside U.S. and allied forces. This phenomenal ship is ready to provide over a half century of naval presence around the globe. This past year marked a significant event in the employment of the *FORD* Class—Full Ship Shock Trials. The positive result of this testing is a tribute to the precision, rigor, and execution that go into the design, production, and delivery of the world's most capable aircraft carrier. The second ship of the *FORD* Class, the *JOHN F. KENNEDY* (CVN 79) continues propulsion plant testing and is on track for delivery to the Navy in 2024. Progress also continues on construction of *ENTERPRISE* (CVN 80) and *DORIS MILLER* (CVN 81), carriers in a two-ship buy that allows the Navy to realize important cost savings, while maintaining a steady, predictable workload within our vital industrial base.

NAVAL REACTORS OVERVIEW

This committee's support has enabled the safe operation of the nuclear fleet, substantial progress on our key projects, and our continued oversight and regulation of all areas across the Naval Nuclear Propulsion Program. Naval Reactors' budget request for fiscal year 2023 is \$2.1 billion. Your past support has allowed significant progress on our three major Department of Energy funded projects—*COLUMBIA* Class propulsion plant development and production, the refueling overhaul of our research and training reactor in New York, and the construction of the Naval Spent Fuel Handling Facility in Idaho. When I first arrived at Naval Reactors in 2015, these three projects had not yet hit their peak funding. Over the course of the past several years, these projects have been a major focus for the Naval Nuclear Propulsion Program. We have managed and lead the way through many challenges, and today, I can confidently say that the development and production of the first *COLUMBIA* Class propulsion plant is proceeding in support of lead boat construction; and the refueling of our research and training reactor will complete within fiscal

year 2023. With your support, the Program also continues to make significant progress on construction of an incredibly important Naval Spent Fuel Handling Facility. While we are staying focused on completing these efforts, we are also preparing for the future with renewed emphasis on advanced and innovative technologies.

MAJOR PROJECTS

COLUMBIA Class Propulsion Plant

The *COLUMBIA* Class ballistic missile submarine remains the Navy's number one acquisition priority. Naval Reactors is supporting lead ship construction and is delivering the life-of-ship reactor core and the electric drive propulsion system for the *COLUMBIA* Class program. The fiscal year 2023 budget includes \$53.9 million that will allow continued support for lead ship propulsion plant design and safety analysis work required for lead ship reactor testing and delivery.

S8G Prototype Refueling Overhaul

The fiscal year 2023 budget request includes \$20 million toward final execution of the refueling and overhaul of the New York land-based prototype, which will enable an additional 20 years of Naval Reactors' commitment to research, development, and initial operator training. Over the course of the past 3 years, the project has worked through performance and testing equipment challenges, and in April of last year met a key milestone—installation of the new reactor core. This reactor core, called the Technology Demonstration Core, includes *COLUMBIA* Class type fuel modules as part of testing and demonstrating the manufacturability necessary for production and delivery of the *COLUMBIA* Class reactor core. We continue to provide strong oversight to improve cost and schedule performance, and the project will complete in fiscal year 2023. I look forward to providing the final update on this multi-year project in next year's appearance before the Committee.

Spent Fuel Handling Recapitalization Project

Naval Reactors is constructing the Naval Spent Fuel Handling Facility (SFHP), located at the Naval Reactors Facility in Idaho. The facility is critical to our mission to manage naval spent nuclear fuel and support aircraft carrier and submarine fleet requirements. The fiscal year 2023 budget request includes \$398 million for continuation of this project through several key milestones. Economic conditions influenced by the COVID-19 pandemic and the discovery of unexpected bedrock conditions beneath the facility's foundations have presented significant challenges for us. To address these challenges, we evaluated actions necessary to ensure the overall Project milestones remain achievable, including additional resources (e.g., extended/added shifts, parallel and fast-tracking of work efforts) and additional funding to mitigate impacts to current and future construction subcontracts. Consistent with these actions, I approved a revision to the SFHP Performance Baseline in fiscal year 2021. Funding in fiscal year 2023 will be critical to implementing our construction sequence. I remain committed to keeping the committee informed of our progress, and actions to mitigate construction challenges, as we aggressively manage and oversee this complex and large-scale infrastructure project.

TECHNICAL BASE FUNDING

In addition to our three priority projects, Naval Reactors maintains a high-performing technical base. The technical base is the set of fundamental skills and capabilities necessary to safely and effectively support the nuclear Navy. It includes a foundation of specialists in nuclear materials, nuclear physics, thermal-hydraulic testing, acoustics, electrical design, software development, system development, refueling, and other specialized skills, along with the associated facilities and laboratories to conduct our work. The people and activities that make up our technical base are leveraged for our priority projects but also perform essential work to support the operating fleet and ensure our day-to-day technological advantage over our competitors. Specifically, the technical base: (1) addresses emergent needs and challenges of our nuclear fleet, (2) executes nuclear reactor technology research and development that supports improving today's fleet and future capabilities, and (3) modernizes critical infrastructure and reduces the Program's legacy environmental liabilities. This base also supports the lean yet highly effective Federal workforce that provides the oversight necessary to carry out this important technical work safely and efficiently. These activities provide 24-7 support to the globally deployed nuclear-powered Navy. Attracting and retaining top talent is critical to our technical base's ability to fulfill and mature our mission amidst a wide array of challenges and new demands in this era of strategic competition. The engineers and scientists

at our Naval Nuclear Laboratory and nuclear capable shipyards are national treasures, who are in high demand from other areas of our economy. We continue to work with the leadership of our labs and private shipyards to identify innovative means to stay competitive in this aggressive talent market.

Program Direction

Our small but highly skilled Federal workforce is critical to execution of our responsibilities. With the fiscal year 2023 Program Direction request, I remain highly focused on attracting, developing, and retaining a talented and diverse workforce to oversee and manage a wide array of work across the Naval Nuclear Propulsion Program to ensure mission success. The talented and dedicated people at our Washington, DC headquarters and field offices are absolutely essential to our strong centralized management and oversight of the important work we perform for our Nation.

Building ships that have over forty years of expected life requires staffing continuity to ensure the Nation has a workforce with the deep technical knowledge needed to execute Naval Reactors' cradle-to-grave responsibilities of these robust systems. I must have sufficient Federal staffing to meet the demands of sustaining and improving today's fleet while simultaneously growing our future capabilities. The cumulative effect of personnel costs growing above inflationary rates and an increase in recent senior level retirements has impeded our ability to reach this goal and challenged our ability to maintain our staffing levels. The market for this talent is exceptionally competitive. Increasingly complex systems, new and innovative research efforts, and growing cyber and other vulnerabilities require additional expertise and new perspectives that can only be gained through reaching our full personnel requirements. I will continue to communicate with the committee on our requirements and progress in reaching our related staffing goals. In concert with our renewed focus on research and development that I have highlighted over the last several years, we need to find new ways to bring the nation's top talent into Naval Reactors and retain this talent to transition technical innovations into our submarines and aircraft carriers. I respectfully request Congress' support, which will allow me to recruit, select, develop, and retain the talented workforce that was started by Admiral Hyman Rickover many decades ago and that has proved to be crucial to the success of the Program.

Research and Development

Our research and development strategy represents a renewed investment in cutting-edge technologies aimed at reversing an eroding capability gap with strategic adversaries like China and Russia. Technology investment must be reinvigorated today to have new technologies ready for future classes of ships and to lower costs and reduce construction timelines. It should be noted that these investments also enhance and improve the performance of today's fleet; this is especially important given the increasing competition in the global maritime environment. Our critical research and development is conducted by the dedicated and talented teams of people at our Naval Nuclear Laboratory 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.

Our first priority is always support of today's fleet. Our labs perform approximately 4,000 technical evaluations annually that enable Naval Reactors to thoroughly assess and respond to emergent issues, thereby keeping our ships mission-ready while ensuring nuclear safety. These efforts are essential to keep our ships at-sea operating abroad for longer periods of time, our carrier strike groups globally engaged, and ballistic missile and attack submarines ready to respond at any time.

Beginning with last year's fiscal year 2022 budget, Naval Reactors has embarked on a path to identify and develop new technologies for inclusion in the next generation of nuclear powered ships while simultaneously delivering the enhanced capabilities to the existing fleet mentioned earlier. We are pursuing advanced reactor core and fuel systems, advanced manufacturing and inspection techniques, next-generation instrumentation and control architectures and sensors, and asymmetrical applications of emerging technologies (e.g., advanced power conversion, artificial intelligence, data analytics, additive manufacturing, and advanced robotics). These advancements have the potential to deliver both greater capability and lower acquisition and lifecycle costs, while ensuring the Navy is constantly improving our advantage and innovating. I commit to further engagement with the committee on these advanced technology maturation efforts to enhance understanding and support for the actions described above. I take great pride in highlighting our innovative and new technologies and how we can transition them into meeting requirements for the Fleet of tomorrow.

I want to assure the committee that our investments are supported by a comprehensive and rigorous planning effort we undertake with our partners at the Naval Nuclear Laboratory. Our annual work execution plans are derived from this comprehensive alignment, and I personally review and approve each plan to ensure we are making the right investments and tradeoffs in all areas of our business.

Facilities and Infrastructure

Our Naval Nuclear Laboratory facilities and infrastructure are essential in carrying out Naval Reactors' mission. This year's budget request supports continuing our recapitalization of Naval Nuclear Laboratory facilities and infrastructure systems, many of which have supported the Program since its inception over 70 years ago. Specifically, this budget includes a consolidation and recapitalization of our thermal hydraulic testing capabilities that will advance cutting-edge technologies and improve testing efficiency. Without these recapitalization efforts, we will be unable to effectively support nuclear fleet operations and advanced research and development efforts at the level required by this complex technology. We are ramping up our efforts in decontaminating and decommissioning (D&D) older facilities that have been in existence since the start of the Program in the early 1950s. We have approximately \$8 billion in environmental liabilities requiring D&D efforts. Over one-third of this estimate is associated with the cost to remediate and demolish inactive facilities and infrastructure at the Naval Nuclear Laboratory sites. We continue to retire these liabilities in an environmentally responsible and cost-effective manner to support best use of our funding. I look forward to future engagement with the committee to discuss our specific actions and tangible examples of Naval Reactors' long-term plan to reach our goals. Through our established partnership with the Department of Energy Office of Environmental Management (DOE-EM), we are leveraging their experience in efficient, safe, and cost-effective remediation of environmental liabilities across the complex. I am pleased with the collaboration on this effort with my partners in DOE-EM.

AUKUS

In September of last year, President Biden announced an enhanced trilateral security partnership between Australia, the United Kingdom, and the United States (AUKUS). The three governments are engaging in an 18-month consultation period to seek an optimal pathway for delivering a conventionally-armed, nuclear-powered submarine capability to Australia at the earliest achievable date. Naval Reactors is playing a key leadership role in developing this plan to ensure that our nation's pre-eminent expertise is applied to the nuclear-powered submarine initiative. We are now more than 6 months into this consultation period and are focused on ensuring Australia understands the full scope of capabilities necessary to design, build, operate, and maintain a nuclear navy, as well as properly dispose a nuclear powered ship at the end of service. This includes an in-depth analysis of the trilateral partners' existing regulatory frameworks, as well as the existing educational, industrial, and technical capabilities, and capacities needed to identify the optimal path forward. This effort involves emphasizing to Australia the key leadership roles, labor talent, and infrastructure investments they will need to contribute to bring this to reality. In February, I along with a team of subject matter experts from Naval Reactors and the United Kingdom traveled to Australia to assess their current capability. During this trip, I met with senior Australian government officials. As part of our discussions, we emphasized that obtaining a nuclear powered submarine capability is a long road which requires steadfast commitment to the highest levels of stewardship. While my number one priority is supporting our current and future nuclear fleet, the AUKUS efforts are being supported by a small cadre of experts who are responsible for ensuring the critical facets of this consultation are completed effectively. The foundation on which this effort is built is made up of our people, our technology, and the facilities that support our own Naval Nuclear Propulsion Program. While Australia is funding this consultation period, Congress' support of Naval Reactors' fiscal year 2023 budget request is vital to support our primary mission and allow the Naval Reactors leadership team the ability to support key activities during the consultation period.

CONCLUSION

The Navy's ability to maintain mastery of the undersea domain and sustain a formidable forward presence and its resultant value cannot be simply assumed. Naval nuclear propulsion is an incredible but unforgiving technology, and must be treated appropriately, with a constant focus on safe operation. Naval Reactor's cradle-to-grave responsibility to manage this technology is paramount, and I assure this committee that I will balance investments in today's fleet with the requirements of a

future fleet, carefully steer future cooperation efforts, and preserve the focus on providing effective naval nuclear propulsion for the United States Navy. I appreciate the strong support this program receives from Congress and respectfully urge your support for our fiscal year 2023 budget request.

B83 MEGATON NUCLEAR BOMB

Senator FEINSTEIN. Thank you very much.

We'll proceed with the questions then. Deputy Secretary Adams, in 2018,—excuse me—I wrote to then Secretaries Mattis and Perry about my concern with the Trump Administration's plan to retain the B83 Megaton Nuclear Bomb. In short, it appeared to me to be unnecessary.

While this Administration did request funding to retain the B83 in fiscal year 2022, I was pleased to see its planned retirement in the fiscal year 2023 budget request, which mirrored the Biden Nuclear Posture Review.

Deputy Secretary Adams, what is the current plan for the B83's retirement?

Dr. ADAMS. So the current plan, first of all, is to ensure the safety of that weapon while it is still in the field. We will be spending appropriately on that.

The second part of the plan is to retire it as soon as practical in accordance with the Nuclear Posture Review.

Senator FEINSTEIN. Well, I think there was some adequate notice last year that at least I was concerned with it. What is the plan for that weapon?

Dr. ADAMS. The plan is to retire it.

Senator FEINSTEIN. And when would that be?

Dr. ADAMS. I don't have the details, but I can certainly take that for the record.

[The information follows:]

The 2022 NPR, led by the U.S. Department of Defense, concluded that the B83-1 should be retired without executing a program to extend the system's life. A cost-benefit analysis was conducted, and the NPR determined the combined age and complexity of the weapon outweighed the benefits of retaining the weapons in inventory. The specific retirement date of the B83-1 is classified and will be provided to the committee through the appropriate means to transmit classified information.

Senator FEINSTEIN. Well, if you would take it and just make note that I'm interested in it. I will follow it. It seems to me this is a weapon that should be retired or a bomb that should be retired. So I'd appreciate that.

NON-PROLIFERATION PROGRAMS

Administrator Hruby and Deputy Secretary Hinderstein, the Nonpro Programs have a good deal to accomplish. This budget request doesn't adequately fund these essential programs and NNSA recently announced it plans to reassess Nonproliferation's priorities.

Administrator Hruby and Deputy Secretary Hinderstein, can you each describe your vision for the future of NNSA's Nonproliferation Program?

Ms. HRUBY. Thank you, Senator. I'll start and then ask Corey to add.

So we have some big challenges, as you mentioned. We have to figure out a new approach to Russia and China. We have to reas-

sure our allies and partners that the Nonproliferation Regime is still working, and we have to look at emerging threats, especially in light of North Korea's actions, Iran's potential not re-entry into the JCPOA (Joint Comprehensive Plan of Action), and other activities around the world.

So we think we have a solid budget request to do that. We're starting some new programs, including programs that focus more on nuclear energy around the world to make sure that it isn't a proliferation risk, and I'll let Corey talk about that, and we also have a small request for a new bio-assurance program.

Ms. HINDERSTEIN. Thank you, Madam Chairwoman.

I think it's really important when we look around the world to recognize that we have invested and will and must continue to invest in our nonproliferation, nuclear security and counter-proliferation programs.

We feel like we have placed a budget request in front of you that meets our most pressing needs, but we also recognize that the world in this space is changing quite quickly.

As the Administrator said, we are focused on making sure that the threats that we understand can be met and countered and that we are anticipating the next threats. We cannot just look at what the problem was before, we have to look at what the problem's going to be tomorrow and for that reason, we're investing in our science and technology base, our research and development base, and our partnership with allies and other partners around the world, including the important international organizations that are able to be operationalized both every day and in the moment of crisis, such as what we've faced with Russia's invasion of Ukraine and their reckless behavior in Ukraine around nuclear facilities.

Senator FEINSTEIN. Thank you very much.

Senator Kennedy.

COLUMBIA CLASS BY 2026

Senator KENNEDY. Thank you, Madam Chair.

Thanks again to all of you for being here. Admiral, Columbia Class, we need it. We need it by 2027 which is when we're supposed to have it. Are we on schedule? Tell me we're going to have it by 2026.

Admiral CALDWELL. Yes, sir. Thanks for the question and thanks for the support of this subcommittee for my programs. It allows me to deliver what I need to for the U.S. Navy.

We are on pace to deliver Columbia on schedule. Now my responsibilities there include the reactor plant and the propulsion plant. On the reactor plant I'm responsible for designing and delivering the reactor core, which is designed to last for over 40 years. That's a pretty heavy technological lift. That core is under manufacture right now and we are on pace to deliver that core in advance of the need for the shipyard's construction schedule.

I'm also responsible in the reactor plant for delivering the heavy components, the large steam generators, reactor vessels, things like that, and thanks to the prior support of this subcommittee I was able to complete the designs and order those materials on schedule in fiscal year 2019. In fact, we're on pace to deliver those to support the construction of Columbia.

In fact, recently I saw the reactor vessel in the shipyard already up there.

There's a lot of other work that goes on to the reactor safety analysis and the manuals that go with the reactor plant. Those are all on the pace that we need to.

The other part of my responsibility is the Department of Navy-funded responsibility to deliver the electric drive. This ship will have——

Senator KENNEDY. Excuse me, Admiral. Give me about 30 more seconds.

Admiral CALDWELL. Yes, sir.

Senator KENNEDY. I'm sorry to interrupt you, but I've got some questions for——

Admiral CALDWELL. All right, sir. Anyway, we're on pace, sir, and thanks to you for your support.

NUCLEAR-ARMED SEA-LAUNCHED CRUISE MISSILE (SLCM-N)

Senator KENNEDY. Okay. I don't know whether to call you Madam Secretary or Madam Administrator.

Madam Secretary Administrator, how about that, tell me why you want to cancel the submarine launch cruise missile.

Ms. HRUBY. Senator, the decision to cancel the SLCM (submarine-launched cruise missile) was made in the 2022 Nuclear Posture Review by the Department of Defense. Our job is to support, you know, to deliver warheads for the Department of Defense, and our budget request is consistent with that.

Senator KENNEDY. You agree with the decision?

Ms. HRUBY. Well, it's not my job to agree or to disagree with the decision. I think there are solid arguments on both sides of this decision——

Senator KENNEDY. Well, you don't have to follow it, do you?

Ms. HRUBY [continuing.] And that the capability——

Senator KENNEDY. You're not bound by what they're recommending, are you?

Ms. HRUBY. My program of record has to be consistent with what the Department of Defense wants in their Nuclear Program.

Senator KENNEDY. Mm-hmm. So you can't call them up and say I think you're making a big mistake here? What are they going to do? Hang up on you? No, I don't think so.

Ms. HRUBY. Well, I think they will tell me that's not my job.

B-83 MEGATON BOMB

Senator KENNEDY. Mm-hmm. I think you can handle yourself, Madam Secretary. I believe you could.

Why do you want to retire the B83 early?

Ms. HRUBY. Again, a similar answer that was the decision in the 2022 Nuclear Posture Review. It is a very old weapon and the decision was made to immediately retire it in the Nuclear Posture Review and the NNSA intends to do that as the Administration decided.

Senator KENNEDY. Are there any strategic targets for which only the B83 can destroy?

Ms. HRUBY. My understanding, and again this is not the heart of my job, but my understanding is that the number of targets the

B83 is credible for has been shrinking and any more than that would need to be in another session.

Senator KENNEDY. An underground nuclear facility could be targeted by B83, couldn't it?

Ms. HRUBY. Again, I don't think that's a discussion we can have in this forum.

PLUTONIUM PIT PRODUCTION

Senator KENNEDY. Yes. All right. Talk to me about the plutonium pit production capability. Our stockpile's aging. What are we going to do?

Ms. HRUBY. That's the heart of why we're developing the capability to produce plutonium pits again and we're doing this in a new manner. We're doing it at two sites, at the Los Alamos National Laboratory and also at the Savannah River Site.

We think this approach will provide the resilience we need going forward and the adaptability that we'll need going forward, but it's a big lift to build a production facility for nuclear materials and we are making good progress on that at Los Alamos and we're finishing the design for Savannah River.

Senator KENNEDY. I'm just going to close with this comment. Sometimes people lie and sometimes they run countries and I think the Ayatollah in Iran habitually lies and if you get rid of that B83 that you want to eliminate, I think you're going to make him smile and I don't think that's in America's interests and I really think you need to reconsider.

Madam Chair, I'm done.

Senator FEINSTEIN. Thank you very much.

Senator Heinrich.

LOS ALAMOS NATIONAL LAB

Senator HEINRICH. Thank you, Madam Chair.

Administrator Hruby, as I know you're aware, yesterday the Cerro Pelado fire was finally over 70 percent contained, a real dramatic improvement from a couple weeks ago, when, given wind conditions, we were all concerned about a run towards Los Alamos.

Can you talk to me about the ongoing efforts between NNSA, the county, the Forest Service, and the Park Service to just coordinate efforts and make sure that we have the maximum defensible space for the lab?

Ms. HRUBY. Yes, Senator Heinrich. Thank you for that question.

We have paid close attention and continue to pay close attention to the fire around Los Alamos. I'm happy to say over the last 3 or 4 years Los Alamos has done a terrific job of clearing fuel on the laboratory property and as a result of this fire actually lent the machines to help clear fuels to the Forest Service and other areas that would provide even a greater barricade to the fire taking hold at Los Alamos.

Senator HEINRICH. I was there on Friday and noticed a lot of work being done sort of in the moment and I think that to the extent that we can make sure that we have those treatments done well before we have an acute event and that means also coordinating with other agencies to make sure that those interagency boundaries are treated.

COMPETES/USCIA (CHIPS AND SCIENCE ACT)

As you know, we're in the middle of trying to resolve differences now between the House and Senate-passed competitiveness bills, COMPETES or USICA or whatever we decide to call them, but the COMPETES bill includes the Restore and Modernize our National Labs Act which authorized just a little over \$30 billion for infrastructure in the labs.

Talk to me about why that's important, what the infrastructure needs are, and why we need to keep that in the legislation as we go through conference, what it will actually mean for American competitiveness and the labs specifically.

Ms. HRUBY. Thank you, Senator Heinrich, for that question.

As has already been said at this hearing, but we are spending a lot of money on revitalizing our production capabilities and we don't want to make the mistake that we made before where we paid a lot of attention to the labs and we didn't pay attention to production. We in fact want a balanced program, but it's hard to do that within the constraints of the budget that we have today.

So this bill that you're talking about would provide us the ability to actually reinvest in the laboratory science capabilities for our NNSA programs and there are many things that we need to do and want to do.

We're currently working hard at the Nevada National Security Site to build new capabilities for sub-critical experiment, but we know we need reinvestment in our inertial confinement fusion programs. We know we need investments in combined radiation experiments at Sandia and so such a bill would be tremendously beneficial to keep our R&D programs second to none.

INERTIAL CONFINEMENT FUSION

Senator HEINRICH. I have heard concern from the labs regarding the fiscal year 2023 request in inertial confinement fusion as well as super-computing and sub-critical experiments.

Are you concerned with the budget levels in any of those areas and the potential impact on the ability of the lab to fulfill any of its basic missions in those areas?

Ms. HRUBY. The answer is yes. This is something that Marv and I talk a lot about, how we create room for investment in science given all the deliverables. At the same time we think that the budget is adequate to do what we have to do, the main deliverables in 2023, but we have to make sure that we have a long-term stable plan and it's a lot easier to invest now than it will be after we get past the point that investment can help, and I don't know if Dr. Adams wants to say anything.

Dr. ADAMS. Very quickly, I'll add that we are looking to develop a long-term plan for the ICF capabilities that will involve judicious reinvestments in existing facilities to upgrade them. It involves maintaining them so that they can continue to deliver for stockpile stewardship, but in the longer term, some of these facilities need to be replaced and developing that long-term strategy is where we're focusing right now. At that point then we'll know how and where to invest.

Senator HEINRICH. Thank you.

PLUTONIUM PIT PRODUCTION

Senator FEINSTEIN. Administrator Hruby, in April I believe you testified that NNSA is still working with the Department of Defense to decide whether 80 plutonium pits per year by 2030 is the correct number we'll need to meet strategic need.

In the meantime, I'm told we're not going to be able to produce 50 pits annually at the Savannah River site until 2032 or 2035 at the earliest.

You've also said that no amount of money will achieve the 80 plutonium pit per year capability faster.

So here's the question. In light of these challenges, what steps is NNSA taking to strengthen pit production management?

Ms. HRUBY. Everything you said is true, although we're not re-examining the requirement for 80 pits per year by 2030. That's a requirement that's given to us by the Department of Defense and the Nuclear Weapons Council.

The things that we're doing, we are trying to make sure that we understand the supply chain issues that may slow construction when we're ready to begin construction. So we are asking to pull money in from out years earlier so that we can buy materials that we know might be supply chain issues, for example, glove boxes, and so that as soon as we complete design, we think we can move apace to do the construction.

Senator FEINSTEIN. Thank you.

Senator Kennedy.

Senator KENNEDY. I'm going to defer, if it's okay, Madam Chair, to my colleague from Tennessee.

Senator FEINSTEIN. Senator, please go ahead.

URANIUM PROCESSING FACILITY

Senator HAGERTY. Thank you, Senator Feinstein, Senator Kennedy. Thank you for holding this hearing.

To our witnesses, thank you for being here, all of you.

I'd like to start out with a question about the Uranium Processing Facility, something that I've been aware of, underway for many years in my home State of Tennessee. It's one of the Federal Government's largest construction projects and over the past 8 years this subcommittee has provided significant funding, including \$600 million in fiscal year 2022, that was \$75 million above the President's budget request.

This year your budget requests \$62 million to continue the construction of UPF (Uranium Processing Facility) and the project has a long history which includes review teams and the Government Accountability Office. The project was originally supposed to be delivered by 2025. Now I understand the new delivery date has been pushed out to August of 2026, is that correct, Ms. Hruby?

Ms. HRUBY. That is correct.

Senator HAGERTY. And what will the impact then be on the goal of having it cost no more than \$6.5 billion if we're going to extend the project timeline out into another year?

Ms. HRUBY. we have a review going on right now to look at what the cost implications will be for the extension and we should have those numbers later this summer.

I do want to say this about the UPF. It's a very large long-term construction project that's very difficult to do and we were doing that during COVID. The heart of that construction occurred during COVID. So I just want to say that I think given the one-of-a-kind construction for a large \$6.5 billion facility that occurred over 8 years that an 8-month construction delay and what we anticipate to be a relatively minor cost increase is a commendable accomplishment.

I mean, obviously we'd like to be exactly on time,—

Senator HAGERTY. Sure, sure.

Ms. HRUBY [continuing.] But given the conditions that we were working in, I still think this is a tremendous success for the country.

Senator HAGERTY. The scale of the project has concerned me for many years. I was Commerce Secretary in my home State when the planning process was going on for this, an ambitious project, one that needed to be done. I'd love to hear your thoughts on the importance of the project now in terms of completing it because I think it'll be good to have on the record.

Ms. HRUBY. Yes. The Uranium Processing Facility, when it's complete, will allow us to take down buildings that are 70 years old and that really are not safe to operate well into the future. We would have to invest an incredible amount of money in them.

So this is really about modernizing an infrastructure that we anticipate needing to use for generations to come.

Senator HAGERTY. I think we're excited in our home State about the potential for that space as it frees up because it has great economic development potential and I think it will help us yield a lot more economic activity from that site, as well.

One of the things that I wanted to talk with you about is the management of the project. I know this is a long-term project, one that is unique, but my understanding is that you currently have a group of independent project management experts that oversee the project and they report directly to you.

I think this group is one of the key reasons that the NNSA construction projects were removed from the GAO's (Government Accountability Office) High-Risk List. Now I understand from the budget request that you're going to reorganize this, get away from that structure and go back to a structure where you don't have this accountable group on top of it.

Can you explain to me the thought process there and how you're going to obtain accountability to see this project through to the end?

Ms. HRUBY. Well, the reorganization that you're referring to is intended to actually increase our attention to construction projects. We're going to have some of the largest construction projects in the U.S. Government not only now but into the future and I want a continuous stream of infrastructure and construction project management that we will have in the new organization and as you know, the person who's been managing that is about to retire. I want to attract the absolute best construction manager in the U.S. Government to that job and I've created a position that I think will allow us to do that. It will still have the same reporting chain.

Senator HAGERTY. Okay. So it'll report directly to you. They'll still have direct oversight. That's my parochial interest here is just making sure that we have the type of talent you describe watching this project as carefully as they have been to make sure that now the new delivery date in August of 2026 is met.

Thank you very much. Thank you, Madam Chair.

Senator FEINSTEIN. Would you like to have another round?

COLUMBIA CLASS SUBMARINE

Senator KENNEDY. I would. I just have a couple more questions,——

Senator FEINSTEIN. All right.

Senator KENNEDY [continuing.] Madam Chair, if that's okay.

Senator FEINSTEIN. Why don't you go ahead?

Senator KENNEDY. Okay. Admiral, I had to cut you off for the sake of our time constraints. I want to let you finish, but I do want to ask you one more question about the Columbia Class submarine.

Can you just briefly explain the importance of that, particularly in light of our new working relationship with Australia and others?

Admiral CALDWELL. Well, sir, first off, the Columbia Class submarine recapitalizes our Trident Ballistic Missile Submarine Force. Today, we have 14 of those and we will recapitalize it with 12 Columbia Class submarines.

The fact that I'm building a life of ship core means that I can do the mission with 12 ships versus 14. That saves the U.S. Government \$40 billion in total ownership costs. That's huge, but importantly that is the foundation for our national defense.

It is the Number 1 investment priority in the U.S. Navy and it is the foundation for our strategic deterrent force.

Now specifically that doesn't pertain directly to Australia but all of the things that I do to deliver the Columbia Class submarine to provide the nuclear stewardship to provide the material and all that expertise, that all enables the support that my program provides to the U.S. Navy as well as the U.K. Navy because we're heavily involved in supporting the Dreadnought work that goes on to recapitalize their SBN and that will all be leveraged to support our new and evolving relationship with the Australians.

Senator KENNEDY. You were about to go into a new topic when I rudely interrupted.

Admiral CALDWELL. I'll hit it real quickly, sir.

Senator KENNEDY. You go right ahead.

Admiral CALDWELL. The Columbia is going to be powered with an electric drive motor versus a steam turbine on earlier ships. That electric drive motor, we know that was a big important step. So we took a lot of steps to derisk that and my team built a facility that has all the major components of the engine room, full size, prototypical, and we've run that.

In August of 2020 we ran that at full power and got a heat run and it performed superbly, and then we've had a 100-hour endurance run.

With that effort, we now have taken the final design turn and we are building the electric drive motor and the supporting components and they will be delivered to the shipyard to support the con-

struction and again that's all enabled by the support of Congress. Thank you, sir.

Senator KENNEDY. Okay. Is there anything else anybody would like to share with us? You've been well coached there. I understand never volunteer. I don't mean that as a criticism.

When I was a young lawyer, I lost a couple cases that I would have won if I would have just shut up.

I want to thank you all for coming. We're looking forward to working with you. I appreciate all the hard work that went into this budget, this proposed budget, but I really think we need to sharpen our pencils and do some more, and I do have some concerns in light of the changing circumstances in terms of geopolitical risk.

Thank you, Madam Chair. I am done.

Senator FEINSTEIN. Well, thank you.

I want to say thank you to Administrator Hruby, Deputy Administrators Adams and Hinderstein, and Admiral Caldwell. We appreciate your being here.

ADDITIONAL COMMITTEE QUESTIONS

The hearing will remain open for 10 days. Senators may submit additional information or questions for the record within that time if they would like and the subcommittee requests that all responses to questions for the record be provided within 30 days.

[The following questions were submitted to the Department, but the questions were not answered by press time.]

QUESTIONS SUBMITTED TO HON. JILL HRUBY

QUESTIONS SUBMITTED BY SENATOR JEFF MERKLEY

Question. What work has been completed and is planned on the low enriched uranium (LEU) research and design program that with the funding Congress has already provided? In 2016, NNSA submitted to Congress a conceptual plan with a 15-year timeline from fiscal year 2018–fiscal year 2032. Since then, which activities in the timeline (e.g., irradiation of HEU fuel samples and/or LEU fuel samples, and post-irradiation examination) has NNSA completed, and how much has that shortened the remaining timeline for Navy LEU fuel system development, if Congress were to provide sufficient funding?

What more needs to be done to complete Navy LEU fuel system development? What is the timeline for completion of an LEU fuel system? What is the total estimated cost for development of a Navy LEU fuel system?

Have the Office of Naval Reactors (NR) and Office of Defense Nuclear Non-proliferation (DNN) resolved any obstacles to information sharing between them that is necessary for DNN's research and development of Navy LEU fuel? If not, what obstacles remain, what is planned to overcome them, and what additional resources are necessary to do so?

What discussions has the NNSA had as part of the Australia-United Kingdom-United States (AUKUS) security pact about providing LEU naval reactors to Australia? Have any concrete plans or steps been taken to provide LEU naval reactors to Australia?

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

W80-4

Question. The budget request includes significant funding for the W80-4, which is the warhead that will be placed in the Long Range Stand Off weapon, or LRSO, that the Air Force is developing.

Can you provide an update on the schedule for the W80-4?

Are you able to keep up with the schedule the Air Force is using to develop the LRSO missile?

W87-1

Question. The W87-1 will support the deployment of the Air Force's next intercontinental ballistic missile, now known as the Sentinel. The W87-1 will require the production of new plutonium pits, so the investments we are making in pit production directly support the development and deployment of this warhead.

Do you expect that we will be manufacturing new plutonium pits in time to support the initial deployment of the Sentinel?

Plutonium Pit Production

Question. Congress mandated a goal of producing 80 new plutonium pits per year by 2030 in order to support our nuclear modernization efforts and ensure that we have the capability to replace our aging stockpile. NNSA has stated publicly that it will not meet the goal of producing 80 new pits per year by 2030 for a variety of reasons.

What support do you need from Congress to accelerate progress toward the production of 80 pits per year?

Sea-Launched Cruise Missile-Nuclear (SLCM-N)

Question. The administration has elected to cancel the sea-launched nuclear cruise missile, despite the importance that program would have in deterring Russia and China. The budget request also does not include any funding for development of a warhead that would be placed on that missile, even though this committee provided \$10 million to begin that project in fiscal year 2022.

How much money would be required in fiscal year 2023 to keep the warhead for a sea-launched cruise missile on schedule, should Congress decide to retain the sea-launched cruise missile program?

QUESTIONS SUBMITTED BY SENATOR BILL HAGERTY

Question. On Monday, May 16, 2022 NNSA announced that it canceled the solicitation for the management and operations of Y-12 and Pantex, terminated the award announcement it made in November 2021, and intends to hold new competitions for separate management contracts of the two facilities individually.

I want the experts at NNSA to make the decision based on the best information available while following all applicable laws and regulations. From the beginning of my term, my only advocacy has been for that decision to be made as quickly as possible.

This is a big decision, one that my constituents have been waiting on for a long time.

Administrator Hruby, can you further elaborate on your decision to separate these two contracts and how it will improve management, specifically at Y-12 National Nuclear Security Complex?

Administrator Hruby, can you discuss what the new timeline, based on Monday's announcement, looks like for awarding a final Management & Operations Contract at Y-12?

What effect, if any, will this decision have on the 5 life extension programs NNSA is currently undertaking?

Finally, can you discuss what budgetary implications this decision will have at Y-12 in the coming years?

SUBCOMMITTEE RECESS

Senator FEINSTEIN. Thank you for being here, and we will stand adjourned. Thank you. The meeting is adjourned.

[Whereupon, at 10:44 a.m., Wednesday, May 18, the subcommittee was recessed, to reconvene subject to the call of the Chair.]