

**Testimony of Secretary of Energy Jennifer Granholm and  
Under Secretary for Nuclear Security Jill Hruby  
Of the National Nuclear Security Administration**

**U.S. Department of Energy  
Before the Senate Committee on Armed Services  
April 26, 2023**

Chairman Reed, Ranking Member Wicker, and esteemed members of the Committee, thank you for the opportunity to appear before you today on behalf of the Department of Energy (DOE) and the National Nuclear Security Administration (NNSA). We recognize and appreciate the Committee's consistent support for DOE's enduring national security missions.

As the Secretary of Energy and Under Secretary for Nuclear Security, we recognize the unique challenges posed by a deteriorating international environment and remain committed to strengthening our nuclear deterrent while reducing global nuclear risks, promoting the peaceful use of nuclear technology to combat climate change, and engage in responsible environmental stewardship and cleanup.

The nation's nuclear weapons stockpile remains the cornerstone of our deterrent and a key tool in reassuring our allies. The Department is aware that we have no margin for error and that we must increase the pace of our nuclear modernization efforts. This heightened pace must be paired with further progress on nonproliferation and counterterrorism measures to prevent terrorists from acquiring nuclear and radiological material and expertise. This is especially significant as the global civilian nuclear power sector expands, and new nuclear technologies are introduced as a means of fighting climate change. Additionally, the Department will continue to provide the U.S. Navy's submarines and aircraft carriers with militarily effective nuclear propulsion plants and is looking forward to being an effective contributor to the new AUKUS partnership.

The FY 2024 Budget reflects the Administration's commitment to these priorities, allowing the Department to enhance our national security, engage in cleanup from our legacy nuclear activities, and promote American leadership on the safe and peaceful use of clean energy.

**NNSA's Fiscal Year 2024 Budget Overview**

The President's FY 2024 budget request for NNSA is \$23.8 billion, an increase of \$1.7 billion, or 7.6 percent, above the FY 2023 enacted level.<sup>1</sup> This funding request reflects the requirements in the nuclear weapons program of record, the National Security Strategy, the Nuclear Posture Review, and other national security strategies and requirements. The funding request supports an expanded mission due to the global environment and takes into account increased costs and delays in construction projects. We are mindful and deeply appreciative of the sustained support from Congress, multiple administrations, and the American people.

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<sup>1</sup> FY 2023 enacted levels throughout this document do not reflect the mandated transfer of \$99.7 million from Naval Reactors to the Office of Nuclear Energy for operation of the Advanced Test Reactor.

## **Weapons Activities Appropriation**

The FY 2024 budget request for the *Weapons Activities* account is \$18.8 billion, an increase of \$1.72 billion, or 10 percent, above the FY 2023 enacted level. The request will be supplemented with prior year balances of \$61.6 million.

The budget request represents the Administration's firm commitment to a safe, secure, reliable, and effective nuclear deterrent underpinned by world-class science and modern resilient infrastructure and protected with advanced physical and cybersecurity measures. The FY 2024 request reflects the increased urgency needed to modernize weapons and refurbish, revitalize, and reinvest in the nuclear enterprise and workforce.

### *Stockpile Management*

The FY 2024 budget request for Stockpile Management is \$5.2 billion, an increase of \$251 million, or 5.1 percent, above the FY 2023 enacted level. Activities include: (1) weapons modernization, (2) stockpile sustainment, (3) production operations, (4) weapons dismantlement and disposition, and (5) nuclear enterprise assurance.

*W88 Alt 370:* The W88 Alt 370 program has entered Phase 6.6, *Full-Scale Production*, and is currently on schedule to meet Department of Defense (DoD) deployment schedules. The budget request of \$179M is \$17M higher than the FY 2023 enacted level, with the increase needed to mitigate risks encountered in Pantex production.

*B61-12 LEP:* The B61-12 LEP has entered Phase 6.6, *Full-Scale Production*. 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. The budget request of \$450 million, \$222 million lower than the FY 2023 enacted level, is informed by carryover and reflects completion of production of many components.

*W80-4 LEP:* The W80-4 LEP has entered Phase 6.4, *Production Engineering*. NNSA revised the first production unit (FPU) schedule in response to COVID-19 impacts, slower than planned hiring and increased attrition, and increased component technical challenges. NNSA's revised schedule is fully aligned with the U.S. Air Force's (USAF) Long Range Standoff Missile's schedule for initial and full operating capability. The budget request of \$1.01 billion is \$113 million lower than the FY 2023 enacted level, consistent with long-standing plans and with typical warhead program profiles, with expenditures ramping down from the current peak as the program moves through its remaining phases.

*W87-1 Modification Program:* The W87-1 will replace the aging W78 warhead using a modification to 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 W87-1 has entered Phase 6.3, *Development Engineering*, and expenditures are ramping up accordingly. The FY 2024 request of \$1.07 billion is \$389 million higher than the FY 2023 enacted level. This request fully supports the increased activity needed

to execute Phase 6.3 in FY 2024. The request is informed by the recently completed Weapon Design Cost Report, the associated Independent Cost Review by the Office of Cost Estimating and Program Evaluation, and analysis of achievable execution rates by the enterprise.

*W93 Program:* The W93 is a third warhead for our submarine launched ballistic missiles and is a new warhead. The key nuclear components will be based on currently deployed and previously tested nuclear designs that will not require nuclear explosive testing to certify. The W93 program is a separate but parallel program to the replacement warhead program in the United Kingdom. In February 2022, the W93 entered Phase 2, *Feasibility Study and Design Options*. The budget request of \$390 million, an increase of \$149 million over the FY 2023 enacted level, reflects the ramp-up associated with Phase 2 and is informed by improved cost estimates.

### *Stockpile Sustainment*

Sustaining today's stockpile is the top priority for NNSA. The Stockpile Sustainment program executes warhead maintenance, limited life component exchanges, minor alterations, surveillance, assessments including annual assessments and significant findings investigations, surety studies and capability developments, and management activities for all weapons systems in today's stockpile. The FY 2024 budget request for Stockpile Sustainment is \$1.28 billion, a decrease of \$44.6 million, or 3.4 percent, below the FY 2023 enacted level.

### *Production Modernization*

The production modernization program re-establishes and modernizes the manufacturing capabilities for nuclear weapons that degraded or were eliminated after the Cold War. The FY 2024 budget request for Production Modernization is \$5.6 billion, an increase of \$439 million, or 8.6 percent, above the FY 2023 enacted level. This funding is focused on the timely establishment of nuclear weapon production capabilities for primaries, secondaries, tritium and depleted uranium, and non-nuclear components.

Primary Capability Modernization includes plutonium pit production and the High Explosives and Energetics (HE&E) Program. NNSA's most pressing recapitalization effort is reconstitution of plutonium pit production. NNSA is statutorily required to produce no fewer than 80 plutonium pits per year (ppy) by 2030. The Department and the Nuclear Weapons Council have previously notified Congress that NNSA will not meet the 80 ppy by 2030 requirement. However, NNSA remains firmly committed to achieving 80 ppy as close to 2030 as possible. The Department remains in close coordination with DoD to maintain the reliability and effectiveness of the nuclear stockpile until pit production capabilities are fully established.

NNSA is proceeding with a two-site approach for producing at least 80 ppy, with the Los Alamos National Laboratory Plutonium facility set to produce 30 ppy and the Savannah River Plutonium Processing Facility (SRPPF) set to produce at least 50 ppy. At LANL, FY 2024 funds will be used to support an increase in engineering evaluations and certification activities to produce war reserve (WR) plutonium pits in tandem with increased equipment purchases and installation activities. NNSA expects the first WR pit to be produced near the end of calendar year 2024 and an increased number of WR pits to be produced each subsequent year. At SRPPF,

FY 2024 funds will continue to support design activities and earlier work on site preparation, demolition and removal of old equipment and materials from the main process building, and long-lead procurements.

NNSA is also restoring, modernizing, and enhancing its enriched uranium, depleted uranium, and lithium manufacturing processes to meet requirements for nuclear weapon secondary stage production. NNSA is making significant, long-term investments in each of these areas while remaining mindful of current difficulties in large-scale construction. For example, NNSA is relocating its enriched uranium processing capabilities into the Uranium Processing Facility (UPF) at the Y-12 National Security Complex (Y-12) and other enduring facilities to reduce mission dependency on building 9212, which is over 75 years old. UPF will provide for the long-term viability and security of enriched uranium processing while improving worker and public safety and promoting environmental stewardship. Ongoing supply chain issues, delayed equipment delivery, contractor performance, inflation, and shortages of qualified labor have contributed to cost growth and schedule delays beyond the originally scheduled completion date of December 2025. In addition to UPF, NNSA is refurbishing buildings 9215, 9204-2E, and 9995 to establish modern processes and extend their operational lifetimes into the 2040s. A key change will be the establishment of electrorefining to provide purified uranium metal and eliminate the current high-hazard chemical process. NNSA is also continuing investments in the Depleted Uranium (DU) Modernization Program initiated at Y-12 in FY 2021. This program will reconstitute lapsed DU alloying and component manufacturing capabilities at Y-12 while investing in new technology to improve efficiency, reliability, and capacity. The equipment at Y-12 formerly used in this process has been inoperable for the last 15 years, and its reconstitution is a critical component of successful weapons modernization.

To address increased mission demand for future mission requirements, NNSA has developed a lithium modernization strategy that includes restarting processes while constructing the Lithium Processing Facility (LPF). LPF will replace the lithium manufacturing processes within Y-12 buildings 9204-2 and 9202, which are lithium recovery, purification, component fabrication operations and salvaging. These buildings are in disrepair and do not possess the capabilities or capacity to meet demands beyond 2035. LPF will provide modern technologies and a safer environment for both workers and the public.

Multi-year modernization plans for tritium reflect increased future demand. NNSA is already increasing production levels at the Tennessee Valley Authority and extracting produced tritium at the Savannah River Site (SRS). NNSA is designing and initiating site preparations for the Tritium Finishing Facility (TFF) at SRS, which will replace a 1950s-era facility. The FY 2024 budget request reflects a prioritization decision to complete the site preparation subproject but move the remainder of the project out in time to focus resources on SRPPF and other higher-priority construction projects. NNSA also supports a Domestic Uranium Enrichment (DUE) program to provide sufficient capacity of unobligated Low Enriched Uranium (LEU) for tritium production and Highly Enriched Uranium (HEU) for naval propulsion fuel, as well as obligated or unobligated High Assay LEU (HALEU) for research reactors. New funding is requested to begin conceptual design activities for an unobligated enrichment technology pilot plant.

The Non-Nuclear Capability Modernization (NNCM) program funds the capability and capacity for non-nuclear components (external to the primary or secondary stage of the nuclear explosive package) in weapon systems. Non-nuclear components provide arming, fuzing, and firing functions and safety and use control features, among others. Providing these functions requires a wide range of technologies and components including radiation-hardened microelectronics, neutron generators, gas transfer systems, power sources, electrical assemblies, cables, connectors, structural elements, pads/cushions, and a multitude of other parts that are incorporated into the systems that support or weaponize the nuclear explosive package. NNCs make up more than half the cost of weapons due to the number and complexity of the elements, and the need for qualification in extreme environments over the warhead life. The FY 2024 request includes funding to provide equipment for increased manufacturing capacity at the Kansas City National Security Campus (KCNSC); reconstitute thermal spray capability at Sandia National Laboratories; recapitalize radiation and major environmental test facilities at Sandia National Laboratories for design and qualification; and provide tools and equipment for the Microsystems Engineering, Science, and Applications (MESA) Complex at Sandia National Laboratories as the only approved source of trusted, strategically radiation hardened microelectronics. FY 2024 funding will also be used to develop production modernization strategies for weapon staging and warhead assembly operations at Pantex.

#### *Stockpile Research, Technology, and Engineering*

The FY 2024 budget request for Stockpile Research, Technology, and Engineering (SRT&E) is \$3.2 billion, an increase of \$246.6 million, or 8.4 percent, above the FY 2023 enacted level. The SRT&E portfolio covers activities that serve as the foundation for science-based stockpile activities, including the capabilities, tools, and components that are used every day 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 Enhanced Capabilities for Subcritical Experiments (ECSE) FY 2024 request is \$292.3 million, an increase of \$15.1 million, or 5.5 percent, above the FY 2023 enacted level. ECSE will produce experimental data in underground tunnels at the NNSS that enables 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 current U.S. policy of a "zero yield" nuclear testing moratorium.

The FY 2024 budget request for the Stockpile Responsiveness Program (SRP) is \$69.8 million, an increase of \$6.1 million, or 9.6 percent, above the FY 2023 enacted level. SRP is responsible for exercising and enhancing capabilities through the entire nuclear weapons lifecycle to improve the responsiveness of the United States to future threats, technological trends, and international developments not addressed by current warhead modernization programs. SRP is investing in efforts to address issues in design for manufacturability, digital engineering, component, and system prototyping and testing.

The FY 2024 budget request for Weapons Technology and Manufacturing Maturation (WTMM) is \$327.7 million, an increase of \$41.5 million, or 14.5 percent, above the FY 2023 enacted level. The WTMM program invests in system-agnostic technology development and advanced manufacturing capabilities to reduce the technological risks and life-cycle costs of maintaining and enhancing the stockpile. Technology and manufacturing maturation enables the development and delivery of design-to-manufacturing capabilities to meet the current programs of record and future nuclear weapons design and production needs of the nuclear security enterprise.

The FY 2024 budget request for the Inertial Confinement Fusion Program (ICF) is \$601.6 million, a decrease of \$28.3 million, or 4.5 percent, below the FY 2023 enacted level, reflecting the use of projected carryover for FY 2024 requirements. The ICF program provides high energy density (HED) science capabilities and expertise that support research and testing across the breadth of the Stockpile Stewardship Program. Its two-fold mission is to meet immediate and emerging HED science needs to support the deterrent of today, and to advance the R&D capabilities necessary to meet those needs for the deterrent of the future. In a breakthrough on December 5, 2022, the ICF Program reached fusion ignition and achieved net energy gain for the first time in history.

The FY 2024 budget request for Advanced Simulation and Computing (ASC) is \$782.5 million, a decrease of \$7.5 million, or 1.0 percent, below the FY 2023 enacted level. ASC will provide NNSA with leading edge simulation capabilities to support weapons design, science-based stockpile stewardship, and stockpile certification activities. The FY 2024 budget request will continue funding maturation of next-generation simulation and computing technologies. Additionally, *El Capitan*, the first exascale computer for national security, is expected to come online at LLNL for classified computing in 2024. At over two exaflops, it will be the world's fastest supercomputer.

### *Academic Programs and Community Support*

Starting in FY 2024, NNSA is proposing to elevate Academic Programs from a congressional-control level within SRT&E to a stand-alone Government Performance and Results Act (GPRA) Unit/control level, and to also establish a Community Capacity Building Program to provide benefits to disadvantaged communities, including Tribal Nations and rural communities, that are affected by activities at NNSA's sites. These changes will enable improved program integration, agility, development, and alignment to critical workforce needs, promote the President's goal of advancing diversity, equity, inclusion, and accessibility through the Federal Government, and bolster underserved communities affected by activities at the NNSA sites in the areas of job creation, community restoration, infrastructure projects, and educational resources. The FY 2024 budget request is \$152 million, an increase of \$40 million, or 36 percent, above the FY 2023 enacted level.<sup>2</sup>

NNSA depends on a strong and diverse base of national expertise in specialized technical areas such as nuclear science, radiochemistry, materials at extreme conditions, high energy density science, advanced manufacturing, and high-performance computing. This budget supports

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<sup>2</sup> Comparison made using a comparable budget structure to that proposed for FY 2024.

managing academic solicitations and competitive awards in these disciplines, enabling connections between these academic research communities and the nuclear security enterprise, and attracting and retaining this pipeline of developed talent to ensure the future workforce of NNSA can meet the evolving needs of the enterprise. NNSA is also building the pipeline for technicians and skilled craft trades to meet ongoing and emerging needs at national laboratories, plants, and sites. The Apprenticeships for Complete and Committed Employment for Specialized Skills (ACCESS) program – outlined in the FY 2020 NDAA – was motivated by the need to support apprenticeships for specialized skills that are vital to the nuclear security enterprise.

## **Infrastructure and Operations**

A well-organized, well-maintained, and modern infrastructure system is the bedrock of a flexible and resilient nuclear security enterprise. NNSA’s infrastructure consists of \$134 billion in assets and facilities. More than 60 percent are beyond their life expectancy, with some of the most important dating back to the Manhattan Project. When the Cold War ended NNSA was left with large and aged buildings, environmental contamination, and the need to close facilities for some key weapon components such as plutonium pits. Going forward, NNSA needs to be creative in facility design and cultivate capabilities that can rapidly scale up or down depending on the international environment and mission need while being minimally disruptive to contracts, workforce, facilities, and the environment. This includes developing strategic partnerships with industry and using new acquisition approaches to purchase facilities rather than pursuing traditional federal construction projects. NNSA is increasingly exploring the use of its real estate authority to achieve timely acquisition of modern, non-complex infrastructure to support the mission.

The FY 2024 budget request for Infrastructure and Operations is \$2.77 billion, an increase of \$164.5 million, or 6.3 percent, above the FY 2023 enacted level. This increase will enable NNSA to operate and modernize NNSA’s infrastructure to support expanded mission objectives and future enterprise resilience. A significant portion of the requested increase will support the Kansas City Non-Nuclear Expansion Transformation plan. NNSA is currently pursuing acquisition of 245 acres of land immediately adjacent to the Kansas City National Security Campus (KCNSC), because the current KCNSC manufacturing capacity is inadequate to support the modernization program of record. The increase also enables NNSA to address external factors such as supply chain delays, inflation, and labor shortages which have raised costs and extended timelines for projects, making it difficult to deliver projects within the baselines established. To address these challenges, NNSA is focused on improving early-stage project and portfolio level planning, identifying and applying lessons learned through independent project reviews, and taking actions to streamline project delivery and increase buying power. NNSA is grateful for the additional authority in the National Defense Authorization Act (NDAA) for FY 2023, which raised the minor construction threshold from \$25 million to \$30 million and provided a three-year pilot program to raise the threshold to account for inflation. This will make a critical difference in NNSA’s ability to further innovate minor construction and complete low-risk projects on time even during a period of higher-than-normal inflation.

Using data-driven risk-informed tools, NNSA pinpoints when and where infrastructure investments are needed and develops innovative execution initiatives to streamline processes,

accelerate delivery, and increase buying power. For example, in FY 2019 NNSA established the EMC<sup>2</sup> pilot program to streamline commercial-like construction projects. The initial program quickly expanded from four projects to ten in 2021, including the addition of five office buildings at LANL to support plutonium pit production. In FY 2022, NNSA completed the LLNL's Emergency Operations Center in just 13 months after receiving full construction funding, the first project under this pilot program. This year, NNSA held the ribbon cutting for the Y-12 Fire Station and the Y-12 Emergency Operations Center. Both projects began construction in 2021 and were ready for full operations in just two years.

### **Defense Nuclear Security**

Defense Nuclear Security's FY 2024 budget request is \$1.02 billion, an increase of \$144.7 million, or 16.6 percent, above the FY 2023 enacted level. The Office of Defense Nuclear Security's primary mission is protecting the facilities, assets, and people responsible for successfully carrying out NNSA's national security missions. Growth in NNSA's mission portfolio, and the associated growth in projects in secure areas such as LAP4, UPF, and SRPPF, along with increased resources necessary to meet core security requirements, has led to increased program requirements for Defense Nuclear Security.

Full funding of the FY 2024 budget request will support these larger requirements as well as high-priority initiatives for the Physical Security Center of Excellence and the Center for Security, Technology, Analysis, Response, and Testing. Additionally, this increase includes additional funding for the West End Protected Area Reduction (WEPAR) project at Y-12 to address cost increases associated with contractor performance, delays in other projects outside WEPAR's scope, and external factors affecting projects enterprise wide.

### **Information Technology and Cybersecurity**

The FY 2024 budget request for information technology and cybersecurity is \$578.4 million, an increase of \$132.7 million, or 29.8 percent, above the FY 2023 enacted level. This request funds current operations and continues investments across NNSA to modernize both unclassified and classified systems and the execution of a robust and effective cybersecurity capability.

The FY 2024 budget request supports the cost necessary to maintain a secure and resilient cyber program. The request invests in operations, mission support, infrastructure modernization, labor growth, and associated investments to execute statutory requirements, Executive Order 14028, policy requirements, and Office of Management and Budget memorandums. The FY 2024 requested increase reflects investments in endpoint detection and response, zero trust architecture, operational technology, enterprise cybersecurity tools and services, and cyber workforce growth at the labs, plants, and sites.

The request funds cybersecurity programs at NNSA's laboratories, plants, and sites to address the significant increase in technology use and keep pace with expanded NNSA mission requirements. The funding increase supports the ongoing modernization of NNSA's network architecture and classified systems, including the Emergency Communications Network. The FY 2024 request includes the costs associated with classified infrastructure and capabilities,



implementation of cloud infrastructure, and unclassified IT services. These improvements reflect NNSA priorities in improving both unclassified and classified collaboration tools and network services, as well as providing redundancy and improved performance for mission partners around the world.

### **Defense Nuclear Nonproliferation**

From its inception, the Office of Defense Nuclear Nonproliferation (DNN) has developed and implemented policy and technical solutions to minimize or eliminate proliferation sensitive materials and limit or prevent the spread of materials, technology, and expertise necessary for nuclear and radiological weapons. Longstanding and growing cooperation with partner governments; international organizations such as the IAEA, the World Customs Organization, and INTERPOL; and the private sector help develop and implement solutions. These programs work side-by-side with both NNSA's Weapons Activities and Naval Reactors programs to implement best practices for nonproliferation and materials security in our own programs. The FY 2024 budget request for the DNN account is \$2.51 billion, an increase of \$19 million, or 0.8 percent, above the FY 2023 enacted level. The request will be supplemented with prior year balances of \$20 million. This account funds all nonproliferation-related activities in the offices of Defense Nuclear Nonproliferation (DNN), Emergency Operations (EO), and Counterterrorism and Counterproliferation (CTCP).

DNN is working in a global landscape that has radically changed in the last twelve months. Russia's unprovoked full-scale invasion of Ukraine; the expansion and diversification of Russian and Chinese nuclear arsenals; the destabilizing activities of Iran and the Democratic People's Republic of Korea (DPRK); the expected growth in nuclear material, technology, and technical expertise resulting from the global expansion of nuclear power and nuclear technology adoption; and the associated risk of illicit smuggling and procurement networks all complicate nuclear nonproliferation missions and demonstrate the need for additional resources and deeper engagement with allies and partners. DNN will utilize these resources to improve capacity and capabilities, develop and incorporate cutting-edge technology required to address future threats, and deepen cooperation with partners.

Globally and domestically, DNN has had success in reducing and eliminating nuclear materials. To date, DNN has removed or confirmed the disposition of nearly 7,300 kilograms of weapons-usable nuclear material from 48 countries and Taiwan, eliminated the need for weapons-grade material at 108 civilian research reactors and isotope production facilities, and converted a cumulative 1,298 kilograms of plutonium to an oxide form in preparation for final disposition. Additionally, DNN has overseen the first three shipments of downblended surplus plutonium from the K area at SRS to the Waste Isolation Pilot Plant in New Mexico and removed 101 cesium blood and research irradiators from U.S. facilities. Working with domestic and international producers, DNN also provided financial and technical assistance for the conversion of the medical isotope molybdenum-99 (Mo-99), which is used in over 40,000 procedures in the U.S. every day, production facilities from using highly enriched uranium to low enriched uranium. As a result, all major global Mo-99 production facilities now use low enriched uranium, eliminating a proliferation threat from a major global industry.

DNN's Nonproliferation and Arms Control Program (NPAC) continues to cooperate closely with the International Atomic Energy Agency (IAEA) to provide subject matter expertise and bolster the international verification regime through technology development and implementation for safeguards, arms control, and emerging challenges. The greater use of nuclear technology is an issue of increased salience for NPAC. In particular, nuclear energy programs are rapidly expanding as countries seek sources of zero-carbon electricity to combat climate change and enhance energy security. Promoting stringent safeguards and security policies and developing new monitoring and verification technologies all in partnership with like-minded countries are key to preventing proliferation. Additionally, NNSA provided technical advice to the interagency and our AUKUS partners on the full suite of requirements that underpin nuclear stewardship to implement the strongest possible safeguards and verification measures while achieving the overall objectives of AUKUS.

DNN also sustains a robust research program that is vital in the development of technical capabilities which support nonproliferation, counterterrorism, and emergency response missions. This program also sustains and develops the foundational nonproliferation technical competencies that promote the agility needed to support a broad array of nonproliferation missions and potential threats. Our DNN R&D program additionally sustains experts in labs and universities, including people and test beds, and develops ways to get ahead of emerging threats.

DNN also recently established a Bioassurance program which coordinates closely with DOE's Office of Science in leveraging national laboratory capabilities and technical expertise by making complementary investment in biological sciences and engineering, computational capability, and classified workspaces to advance fundamental understandings of biology and adapt those understandings to bio-resilience and advancing capabilities for detection and attribution of biological weapons development activities. The Department appreciates Congress' support for the establishment of this program.

### **Nuclear Counterterrorism and Incident Response**

The FY 2024 request for Nuclear Counterterrorism and Incident Response (NCTIR) is \$493.5 million, an increase of \$23.6 million, or 5 percent, above the FY 2023 enacted level. The NCTIR program supports two subprograms: Counterterrorism and Counterproliferation (CTCP) and Emergency Operations (EO).

The CTCP subprogram advances the nation's technical capabilities to understand, defeat, and attribute nuclear threat devices, including INDs and lost or stolen nuclear weapons; provides technical guidance on physical security requirements for nuclear materials; and conducts Nuclear Threat Reduction exchanges with the United Kingdom and France to prevent, counter, and respond to nuclear terrorism and nuclear proliferation.

CTCP also manages NEST, NNSA's multi-mission emergency response capability comprised of scientific and technical experts who are trained and equipped to respond rapidly in the event of a nuclear or radiological incident or accident worldwide. NEST includes nuclear forensics capabilities that enable technical personnel to identify the origin of nuclear material interdicted outside of regulatory control or used in a nuclear attack.

Russia's full-scale invasion of Ukraine has resulted in an increased operational posture for CTCP since February 2022. In FY 2023, CTCP received supplemental appropriations of \$110.3 million to support the U.S. Government's response to Russia's ongoing war in Ukraine. CTCP is using these funds for radiation detection and monitoring of Ukrainian nuclear facilities; personal protective equipment; emergency diesel generators; and procurement of diesel fuel and consumables for Ukraine's nuclear power plants. CTCP will continue to deliver incident response training and build capacity among responders in Ukraine and other partner nations.

The EO subprogram provides both the structure and processes to ensure a comprehensive and integrated approach to all-hazards emergency management across the Department. The EO program aims to improve readiness and effectiveness of the DOE Emergency Management System and the nuclear security enterprise response regardless of the nature or location of the emergency. FY 2024 funding provides for 24/7/365 Consolidated Emergency Operations Center communications and coordination support to the DOE/NNSA Emergency Management Enterprise, nuclear security enterprise, and Departmental senior leadership.

### **Naval Reactors Appropriation**

With 79 ships, or more than 40 percent of the Navy's major combatants<sup>3</sup>, relying on nuclear propulsion technology, maintaining a qualitative edge in this area remains critical to our national security posture. Providing the nation's submarines and aircraft carriers with unparalleled mobility, flexibility, responsiveness, and endurance is vital in today's complex geopolitical environment. The ability to maintain robust fleet capabilities on long-term missions is essential for the security of global trade and our allies. The Office of Naval Reactors remains the foundation of this national achievement in global security. Continuous progress in the Naval Nuclear Propulsion Program gives the U.S. Navy a decisive edge in naval warfare and enhances the security and reliability of the sea-based leg of our nuclear triad.

The FY 2024 budget request for *Naval Reactors* is \$1.96 billion, a decrease of \$117.3 million, or 5.6 percent, below the FY 2023 enacted level. This decrease reflects the revised funding profile for the Spent Fuel Handling Recapitalization Project that was recently re-baselined, and near-complete refueling and overhaul of the S8G Prototype land-based reactor in New York. The budget request supports the continued safe and reliable operation of the nuclear-powered fleet and provides for the continued maintenance, oversight, and operations at the four Naval Nuclear Laboratory sites and the associated contractor workforce. Funding also supports requirements for the office's major initiatives: *Columbia*-class ballistic missile submarine reactor systems development; development of the next generation SSN(X) attack submarine; and continued progress on base technology development, infrastructure recapitalization at program sites, and decontamination and decommissioning efforts.

Consistent, sustained funding is vital for the support of these efforts and will allow Naval Reactors to meet current and future force needs; this foundational support of Naval Reactors is critical to our ability to deliver on AUKUS. The *Columbia* -class lead ship remains under

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<sup>3</sup> Major combatants, in this instance, include aircraft carriers, submarines, and surface combatants based on the "Active in Commission" column from the Naval Vessel Register

construction and the Spent Fuel Handling Recapitalization Project at the Naval Reactors Facility in Idaho is ongoing. Additionally, work is underway to invigorate long lead-time technology development for the current and future nuclear fleet while supporting specific requirements to meet the Navy's timeline for the next-generation attack submarine ship authorization.

### **NNSA Workforce**

NNSA's workforce represents the backbone of the nation's nuclear security enterprise. The FY 2024 budget request is \$539 million, an increase of \$64 million, or 13.5 percent, above the FY 2023 enacted level. The FY 2024 request supports staffing levels sufficient to provide oversight and leadership for our growing mission requirements in the modernization, recapitalization, nonproliferation, and counterterrorism programs. NNSA seeks to recruit and retain top talent in a wide array of fields including science, engineering, crafts and trade, business, foreign affairs and social sciences, and project and program management.

### **New and Critical Phase of the Environmental Management Mission**

As important as the missions of today and tomorrow are, the Cold War left an indelible mark on America. It is the mission of the Office of Environmental Management (EM) is to address the legacy of nuclear weapons development and government-sponsored nuclear energy research that has played a significant role in domestic security and prosperity.

As the largest environmental cleanup program in the world, EM plays a key role in the Department's overarching mission to protect the planet. The Department's FY 2024 budget request of \$8.3 billion will help EM continue to make progress in fulfilling the government's responsibility to clean up the environment in communities that supported nuclear weapons programs and government-sponsored nuclear energy research. EM's vital mission also helps to support and enable DOE's ongoing national security and scientific research missions.

Over the last 30 years, EM has achieved significant progress for the environment, completing cleanup at 92 out of a total of 107 sites. That progress continues today. In 2022, EM teams across the country crossed the finish line on key demolitions, treated and relocated millions of gallons of waste, and deepened our engagements with local Tribes and communities all while curbing pollution and contributing to climate solutions.

Deactivation and demolition work at the Oak Ridge National Laboratory and the Y-12 National Security Complex is reducing environmental risks and enabling research and national security missions. At the Hanford site in Washington state, EM has cocooned the seventh reactor along the Columbia River leaving just one more to go. EM has also treated over 400,000 gallons of radioactive and chemical waste from large underground tanks at the Hanford Site where work is progressing towards startup of a system that will convert this waste into glass for disposal. This Spring, the EM team in Idaho met a key commitment to the state of Idaho by completing the transfer of EM-owned spent nuclear fuel to on-site dry storage and marked a historic achievement with the startup of a new tank waste treatment capability that will address one of the Department's greatest challenges at the site.

At the Savannah River Site in Aiken, South Carolina EM is processing record amounts of tank waste and continues to advance the Advanced Manufacturing Collaborative facility which will help meet the needs of the Department's cleanup mission and help develop a diverse and talented next generation workforce.

More than 200 transuranic waste shipments were received last year at the Waste Isolation Pilot Plant (WIPP) in New Mexico from five generator sites. In addition, EM has launched demolition of the West Valley Demonstration Project's Main Plant Process Building, a priority that will continue this year and will further advance under the Fiscal Year 2024 budget request. The Nevada National Security Site is preparing to demolish four Test Cell C buildings this year and will continue to reduce the cleanup footprint there in Fiscal Year 2024.

The FY 2024 request include \$7.5 billion for defense environmental cleanup activities, which covers most major EM sites and includes the Uranium Enrichment Decontamination and Decommissioning Fund contribution. The request builds on recent progress, reflects the Department's strong commitment to protecting the environment, enabling national security and scientific research missions, as well as delivering for communities most impacted by the legacy of the past. The request supports a ramp up in EM's ability to tackle tank waste --- one of the Department's largest environmental challenges and financial liabilities. The request will also enable continued progress in infrastructure improvements at the Waste Isolation Pilot Plant and support waste shipments from across the EM program. In addition, EM will continue to advance facility demolition and risk reduction projects across the program.

The request of \$1.97 billion for the Office of River Protection will enable EM to advance commissioning and startup of the Direct Feed Low Activity Waste system and includes a \$600 million investment to ramp up work on the Waste Treatment Plant's High Level Waste facility. Also at Hanford, the request of \$1.02 billion for the Richland Operations Office will enable continued risk reduction activities including advancing the transfer of cesium and strontium capsules to dry storage and treating another 2 billion gallons of contaminated groundwater.

At the Savannah River Site, the request of \$1.74 billion supports utilization of capabilities to accelerate the tank waste mission. The request will also maintain a high state of readiness for H Canyon, the only chemical separations facility remaining in operation in the United States.

At the Idaho Cleanup Project, the request of \$447 million supports operations of the Integrated Waste Treatment Unit which will ultimately treat about 900,000 gallons of liquid waste by turning it into a granular solid.

Along with providing for continued Waste Isolation Pilot Plant operations, the budget request supports key modernization and infrastructure recapitalization priorities. Shipments of legacy transuranic waste to the Waste Isolation Pilot Plant will progress from sites across the DOE complex, including the Los Alamos National Laboratory in New Mexico.

EM's FY 2024 budget also facilitates the Department's broader national security and scientific research missions. With the first-ever demolition of a reactor in the central campus area at the Oak Ridge National Laboratory and the successful cleanup of a portion of the Y-12 National

Security Complex that will be utilized by the NNSA for a new Lithium Processing Facility, EM's steady progress is a part of a broader vision focused not only on cleaning up the past, but also helping prepare for expanding national security and research missions in Oak Ridge, Tennessee. The request builds on that progress with \$519 million for Oak Ridge to continue cleanup operations at the Oak Ridge National Laboratory and Y-12 National Security Complex excess facilities.

In addition to enabling impactful progress at EM sites, the FY 2024 request reflects a planning approach that will boost the Department's ability to complete its clean up mission and deliver for impacted communities. Today, the environmental management mission is at an important crossroads. After 30 years of mitigating the most pressing risks, the program is embarking on a new and critical phase of the mission that requires addressing some of the toughest challenges.

To address these challenges, the Department will need a deep and diverse bench of Science, Technology, Engineering, and Math talent. The FY 2024 request invests in building a workforce for the future that promotes diversity, equity, inclusion, and accessibility. That includes high-quality jobs in environmental cleanup where workers from all backgrounds can make a living and make a difference. The budget request includes \$56 million to continue EM's recently expanded Minority Serving Institutions Partnership Program.

While the mission is rooted in the environmental legacy of the past, EM is also focused on the possibilities for the future. As cleanup progresses, EM is opening up possibilities for a clean energy future, good paying jobs and thriving communities and Tribal Nations. The FY 2024 request represents a significant investment in helping the communities grow and thrive. The budget request includes support for the Tribal Nations, Alaska Native communities, and communities near EM sites ensuring they are safe, providing opportunities for local input into cleanup priorities and helping build a vibrant future. The request includes Payment in Lieu of Taxes funding for communities near Hanford and Savannah River to support schools, roads and other local priorities. A \$40 million investment is included for the Community Capacity Building initiative as well as support for EM's participation in the Department's cross-cutting Justice40 Initiative. This initiative has led to expanded grants to support community and Tribal engagement as well as STEM and Community Based Education programs.

The Department will continue to work hand-in-hand with workers, unions, Tribal Nations, local communities, and Congress to protect the environment, plan for continued cleanup and foster successful visions for the future.

### **Enhancing Cybersecurity**

#### *Cybersecurity Threats to the Energy Sector*

Within the United States energy sector, an incredible transition is underway. New sources of energy generation are coming online; new digital tools and technologies are being leveraged to improve reliability and efficiency; and new market forces are shaping how we interact with energy daily, in vehicles, homes, and businesses across the country. With these changes come new risks and new opportunities to advance our cybersecurity posture.

The Department's Office of Cybersecurity, Energy Security, and Emergency Response (CESER) is focused on securing the nation's energy infrastructure against all hazards, reducing the risks and impacts of cyber and other disruptive events, and supporting state, local, tribal, and territorial governments (SLTT), as well as industry, with response and restoration when a disruption occurs.

As this committee knows well, DOE has tremendous expertise both at headquarters and across the 17 National Laboratories to help us tackle cyber threats to the U.S. energy sector. DOE, through CESER, leads numerous efforts to push the boundaries of what is possible in energy cybersecurity.

I will highlight three initiatives that CESER is leading to enhance energy cybersecurity: 1) the Energy Threat Analysis Center (ETAC) pilot efforts; 2) Energy Cyber Sense; and 3) additional efforts to integrate cybersecurity into next generation energy systems.

#### *Enhancing Cyber Threat Collaboration*

The congressionally chartered Cyberspace Solarium Commission and the recently released National Cybersecurity Strategy (NCS) call out the need for shared responsibility between the public and private sectors, as much of the nation's energy infrastructure is privately owned and operated. The NCS specifically highlights DOE's pilot of the ETAC as an example of the new and innovative capabilities that the nation needs to build to effectively collaborate at the scale and speed needed to defend critical infrastructure. In coordination with CISA and the private sector, the ETAC pilot will bring experts from government and industry together to analyze and address cyber threats to the energy sector. The work of the pilot will inform a feasibility study, which will provide a roadmap for the future of the ETAC. Through this new, persistent, operational approach to cyber collaboration, we will close gaps in our collective situational awareness of threats, improve our ability to mitigate and defend against them, and support the nation's response to incidents within the energy system.

#### *Securing Energy Sector Supply Chains*

The Infrastructure Investment and Jobs Act (IIJA) made crucial investments in the cybersecurity of our energy sector supply chains. The IIJA called upon DOE to establish an Energy Cyber Sense program to strengthen the cybersecurity of hardware and software the sector depends on to operate the energy systems of today. Energy Cyber Sense will serve as a hub for CESER activities related to development of supply chain policies, standards, testing, educational awareness, and others to allow the Department to take a broad view of addressing this cyber risk. Lessons learned from this program will be shared with energy sector asset owners and manufacturers who are best positioned to address them. A flagship initiative of Energy Cyber Sense is the Cyber Testing for Resilient Industrial Control Systems, or CyTRICS™ program, which leverages the best-in-class test facilities and analytic capabilities of the DOE National Laboratories to inform improvements that strengthen the security and resilience of hardware and software in the energy sector. CyTRICS™ partners with top manufacturers and utilities in the sector to identify systemic supply chain vulnerabilities that can help us engineer out cyber weaknesses in next-generation energy systems.

#### *Building in Security into Energy Systems*

It is far more efficient and effective to build in security measures as new technologies are designed than it is to bolt on cybersecurity solutions once hardware or software is in use. In addition to our supply chain investments focused on security, CESER is also focused on a number of efforts to realize security by design in the energy sector including the development of cybersecurity baselines for owners and operators and investments in research, development, and demonstration (RD&D) to bring new solutions to the market.

In 2022, several states began exploring the development of cybersecurity baselines for utilities operating within their jurisdiction. To prevent a patchwork approach to the implementation of cyber baselines, CESER provided funding to the National Association of Regulatory Utility Commissioners (NARUC) to kick off an effort to establish a set of cybersecurity baselines for distribution electric systems and distributed energy resources. The focus of this engagement is to establish cybersecurity best practices that will demonstrably buy down the cyber risk to our country's energy infrastructure. This effort will help create a more stable, more predictable business environment for energy innovators over time while having a real impact on the overall cybersecurity of our energy systems.

DOE is also actively working to reduce risks to the electricity, oil, and natural gas systems through threat-informed RD&D of next generation tools and technologies that provide U.S. energy companies cutting-edge cyber protection, monitoring, detection, response, containment, forensics, and recovery capabilities. Last year, CESER released a \$45 million Funding Opportunity Announcement (FOA) to strengthen the cybersecurity of next generation energy systems that will create, accelerate, and test technology to protect our energy systems from cyber attacks. Further, CESER executed a \$12M FOA to establish a network of university-based, regional cybersecurity research and development centers across the nation. Finally, CESER awarded \$12M for six university-based RD&D projects focused on the development of cutting-edge cyber-physical platform tools and technologies that can detect and mitigate incidents in electric power systems. DOE will also continue to implement the Cybersecurity for the Energy Sector Research, Development, and Demonstration Program pursuant to Section 40125 of the IIJA. This \$250 million program is designed to support the development and deployment of advanced cyber applications, technologies, and threat collaboration efforts through cooperative agreements and contracts with utilities, the National Labs, manufacturers, and vendors. The first Lab Call for this program is expected in the coming weeks.

## **Conclusion**

At DOE, we continue to make progress in fields that enhance American national security during a time of significant global challenges. NNSA's weapons activities, nonproliferation and counterterrorism, and naval reactors programs all play key roles in reducing global nuclear threats and supporting our nuclear deterrent which remains the cornerstone of our national defense. The Department faces an expanded mission at a time of supply chain disruptions, inflation, great power competition, and increased impacts from climate change. We are determined to succeed and continue providing for the American people. We appreciate the trust and resources the Committee has placed in us to meet this moment and are thankful for the continued support of the public and the rest of Congress.