

NATIONAL NUCLEAR SECURITY ADMINISTRATION

STRATEGIC VISION

Strengthening our Nation through Nuclear Security



MISSION:

To protect the American people by maintaining a safe, secure, and effective nuclear weapons stockpile; by reducing global nuclear threats; and by providing the U.S. Navy with safe, militarily-effective naval nuclear propulsion plants











FROM THE ADMINISTRATOR



The National Nuclear Security Administration's enduring mission is to protect our nation by maintaining a safe, secure, and effective nuclear weapons stockpile, reducing global nuclear threats, and providing our submarines and aircraft carriers with militarily effective nuclear propulsion. Although we have numerous strategic partners that enable, contribute to, and benefit from our efforts, no other organization, government or civilian, can accomplish our unique mission on behalf of the American people. In this area, we stand alone.

This strategic vision pursues urgent change at a significant scale to develop creative

approaches, make sustained investments, and be disciplined in our approach to develop a nuclear capability for our time and for the foreseeable future. It is incumbent on us to anticipate our future security challenges and ensure our country is ready to meet them.

Not doing so would have far-reaching consequences. Failure to meet our vital mission objectives will erode confidence in the security that the United States strategic deterrent umbrella provides.

In assessing the current mission environment in NNSA, we can count on one thing-change:

- The geopolitical environment for our deterrent is ever-changing
- Threats from rogue states and terrorists are evolving
- Our nuclear weapons and the infrastructure that supports them are aging
- Science and technology continue to move forward at an ever-increasing pace

In this dynamic environment, it is not sufficient to remedy today's situation and meet our current mission requirements. We must lean forward in the development, planning, and execution of programs that address our current challenges while developing the workforce, infrastructure, tools, and governance systems that will enable us to meet our deterrence, non-proliferation, and naval propulsion mission requirements for the next 50 years. We must embrace a next-generation enterprise that is flexible enough to respond to future challenges.

With decades of stagnation following the end of the Cold War, we find ourselves in the unenviable position of implementing near-term fixes while using those lessons learned to better prepare for the future. Without sustained and predictable investments to restore and modernize our infrastructure, we will rapidly lose our ability to deliver on our promise of a safe and reliable nuclear weapons stockpile, which will degrade our deterrent capability and render legacy weapon systems irrelevant to the defense of our nation. We must not and will not allow the next generation of our nuclear security enterprise to simply maintain the status quo.

We have a storied past that guides us. For 75 years our enterprise has overcome every challenge, led the country in incredible scientific and engineering endeavors and discoveries, and successfully ensured constant vigilance in maintaining an effective deterrent, reducing global nuclear threats, and powering our nuclear navy. Now is the time for us to take decisive action in forging the enterprise of the future.

As I have traveled to all of our labs, plants, and sites and met with people across our complex, I have been left with one overwhelming impression: the incredible workforce that makes up our nuclear security enterprise is up to all of the challenges we have before us. Together we can and will ensure that those in the future workforce have the resources and the responsive, agile infrastructure they need to maintain the systems of today and to design and field the systems of tomorrow.

Jua C. Horde-Haze LISA E. GORDON-HAGERTY

LISA E. GORDON-HAGERTY Under Secretary for Nuclear Security and Administrator, NNSA



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Vision for the Future and Desired Outcomes

An NNSA that demonstrates excellence and is responsive to the nation's nuclear security and strategic defense needs.

The following desired outcomes support this vision of the future:

- On-time and on-budget nuclear warhead modernization programs that meet the highest standards of safety, security, and effectiveness.
- An adaptive, agile, responsive, and resilient national security enterprise hedged against geopolitical and technological surprise and able to meet evolving military and nonproliferation requirements.
- An enterprise with best-in-class safety and physical security practices, emergency preparedness and response, nuclear forensics capabilities, and enhanced cybersecurity with expertise to counter the unexpected.
- A nuclear navy with safe and efficient naval nuclear propulsion plants capable of responding to the dynamic challenges of the 21st century national defense environment.
- An empowered workforce with a unified leadership that provides innovative, cost-effective, and timely technical solutions to meet current and future challenges with minimized schedule and operational risks.
- An institutional culture and individual behaviors that reflect the urgency of the national security mission and espouse a set of core values in how we conduct our work.
- An annual assessment of the stockpile to strategically plan future sustainment actions.

Our mission requires a world-class workforce with scientific and engineering expertise operating in a robust, agile, and adaptive nuclear infrastructure.

STRATEGIC ENVIRONMENT

The United States faces an increasingly dangerous world that is filled with a broad spectrum of emerging and enduring threats. Rival powers, rogue regimes, and terror groups all threaten the safety, security, and interests of the United States and that of our allies and partners. They are competing with us in multiple ways to challenge our geopolitical advantages and assert their interests and values. This competition exists across all dimensions of power and in all domains. These developments are magnified by rapid technological advancements, blatant disregard for international norms and treaties, and the changing character of war in ways that disadvantage the United States and its allies.

On the nuclear front, the United States now faces more diverse and advanced nuclear threats and challenges than ever before in an environment that is also increasingly volatile and unpredictable. Significant concerns in today's environment include the potential for further proliferation of weapons of mass destruction (WMD), the missiles to deliver WMD at long range, and evolving nuclear technologies in the hands of a variety of actors, some of which are not friendly to the United States. This puts a premium on a U.S. nuclear deterrent that is robust, flexible, adaptive, and wellpositioned to meet future requirements. It also demands the U.S. Navy continue asserting its "forward presence" by providing safe, reliable, and long-lived nuclear propulsion plants.

POLICY DIRECTION

FOUR PILLARS OF THE 2017 NATIONAL SECURITY STRATEGY

Protect the American people, the homeland, and the American way of life.

Promote American prosperity.

Preserve peace through strength.

Advance American influence.

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These significant changes in the threat environment bring both new opportunities and challenges to NNSA in meeting our national security mission. The opportunities flow directly from the security vision articulated in the 2017 National Security Strategy (NSS) and the requirements laid out in the 2018 Nuclear Posture Review (NPR). The critical role of NN-SA in meeting the requirements is an affirmation of the world-class work done within the NNSA complex and, specifically, of the people who bring their unique skills and personal commitment to this important work. To this end, we work as one team to meet NNSA's nuclear mission.

We must continually improve business processes to overcome challenges. We must address the gaps and shortfalls in critical infrastructure and in the manufacturing of strategic materials. We must ensure that we have the expertise and specialized/ advanced facilities required across all laboratories, plants, and sites to maintain the current stockpile along with the capabilities to develop and certify the future stockpile. We must continually review and assess our enterprise-wide governance and management culture to ensure that we are effectively and responsibly managing our workforce and mission.

President Trump's vision of national security is articulated in the NSS, which requires NNSA to play a critical and increasing role in protecting the United States. In turn, the NPR asserts the importance of the role of a modernized nuclear deterrent in that vision. NNSA is undertaking a comprehensive warhead modernization program, which we must deliver to the Department of Defense (DoD) on-time and on-budget. This includes the execution of the ongoing warhead life extension programs.

The NPR commits the United States to maintaining a nuclear posture that is "second-to-none" by modernizing and recapitalizing all three legs of the nuclear triad—a requirement that necessitates a comprehensive update to NNSA's aging infrastructure that is essential for maintaining the nuclear arsenal. The NPR also recognizes the enduring value of the sea-based deterrent as the most assured form of nuclear retaliation, supported by NNSA's safe and effective nuclear propulsion program for the Navy.

The NPR further commits the United States to fully meeting its obligations under the Nuclear Non-Proliferation Treaty and to pursuing arms control measures that enhance national security. The nuclear security enterprise plays a pivotal role in supporting and informing the development of national policy in these areas.

2018 NUCLEAR POSTURE REVIEW, U.S. NUCLEAR CAPABILITIES, AND ENDURING NATIONAL OBJECTIVES

Deterrence of nuclear and non-nuclear attack.

Assurance of allies and partners.

Achievement of objectives if deterrence fails.

Capacity to hedge against an uncertain future.

Modernization of our infrastructure.

From the President of the United States, Donald J. Trump:

"We must prevent nuclear weapons and materials from coming into the hands of terrorists and being used against us, or anywhere in the world..."







ENTERPRISE GOVERNANCE AND MANAGEMENT

The President has provided a pathway to address the opportunities and challenges with new resources and clear direction. We are acting now so that the United States is ready to overcome anticipated and unanticipated challenges. Our team at headquarters (HQ), field offices, labs, plants, and sites and our strategic partners within the U.S. interagency community and among foreign counterparts are poised to continue making essential contributions to U.S. and global security now and into the future. To address these challenges and to ensure we can fully meet our national security mission priorities over the long term, NNSA has four key expectations for the governance and management of the nuclear security enterprise:

- We work with a single purpose as "One NNSA" through more effective teaming and improved mission integration.
- 2) We ensure every member of our workforce knows and understands our mission and his or her role in accomplishing it.

- We empower leadership to streamline decisionmaking and manage rather than avoid risk.
- We execute the mission based on clearly defined roles, responsibilities, authorities, and accountability to prevent redundancy and miscommunication.

We can fully meet these expectations together by embracing a core set of values and behaviors. Integrity, trust, respect, accountability, and excellence are the core values that support our purpose and reflect our deeply held beliefs. These values are built on open communication, transparency, collaboration, and unwavering commitment to safety and security, which form the foundation for appropriate federal oversight, site-level contract assurance, Management & Operations (M&O) corporate parent(s) engagement, and the commitment of our federal, HQ, field office, lab, plant, and site partners to mission success. Our mission cannot be achieved without a constant focus on, belief in, and passion for our core values. Embracing these values and their resulting behaviors enables us to achieve our mission.

MISSION PRIORITIES

We must put the mission first to ensure we can meet our deliverables on time and on budget in support of the nation's security. To that end, the execution of this *Strategic Vision* is built along five mission lines of effort. While this *Strategic Vision* documents our core values and enduring objectives that will sustain our work well into the future, the mission priorities described in the lines of effort below focus on deliverables and milestones over the next five years. Our *Strategic Integrated Roadmap* provides a visual display of NNSA's highest-level milestones and deliverables over the next 25 years.

MISSION PRIORITY #1

Maintain the safety, security, and effectiveness of the nation's nuclear deterrent:

With four weapon modernization programs underway, we are executing an unprecedented variety of complex component development and production work in conjunction with maintaining the legacy stockpile. Alongside the current programs of record, we must also implement the strategy to achieve the strategic priorities laid out in the *Nuclear Posture Review* (NPR), under the purview of the Nuclear Weapons Council. In evaluating our options for meeting the NPR-mandated capability to produce no fewer than 80 pits per year by 2030, we have chosen to repurpose the Mixed Oxide Fuel Fabrication Facility to produce 50 pits per year and to continue the efforts at Los Alamos National Laboratory to produce 30 pits per year.

- Complete production of the W76-1 warheads by fiscal year (FY) 2019 and complete the W76-2 modification to meet DoD requirements.
- Deliver the first production unit of the B61-12 gravity bomb by FY 2020 and complete production by FY 2024.
- Deliver the first production unit of the W88 Alteration 370 (with a refresh of the conventional high explosive) by FY 2020 and complete alterations by FY 2024.
- Achieve a first production unit of the W80-4 warhead by FY 2025, with completion of the life extension program (LEP) by 2031 and ensure alignment with the Department of Defense Long Range Stand Off Program.
- Advance W78 warhead replacement activities by one year to FY19 to support fielding on the Ground Based Strategic Deterrent by FY 2030.
- Sustain the B83-1 unit until a suitable replacement is identified.
- Continue execution of the Stockpile Responsiveness Program.
- Provide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030 by expanding plutonium pit production capabilities.
- Conduct annual assessments to evaluate the safety, reliability, performance, and military effectiveness of the nuclear weapons stockpile.
- Assure continuous and reliable supply of strategic materials for military needs, including uranium, plutonium, tritium, lithium, and high explosives.



Reduce global nuclear security threats and strengthen the nuclear enterprise:

Nuclear threat reduction is a pillar of the NNSA mission. Nuclear threats are real and constantly evolving, and it is critical that we address these threats through integrated, coordinated efforts that draw on the best of our scientific talent and technical expertise. Our goals are to: prevent hostile states and non-state actors from obtaining nuclear weapons or weapons-usable nuclear materials, or advancing nuclear weapons capabilities; counter any efforts that could result in the acquisition of a nuclear weapon, nuclear weapons usable material, improvised nuclear device, or radiological dispersion device; and maintain the capacity to respond to nuclear or radiological incidents, should they occur.

We achieve our goals through the execution of programs that: minimize nuclear and radioactive materials no longer in use; strengthen the international safeguards system to detect and deter diversion of nuclear material from peaceful purposes to nuclear weapons or other nuclear explosive devices; secure nuclear materials and secure nuclear facilities and radioactive materials in use; prevent and counter the further spread of sensitive nuclear materials, technology, and expertise to states of concern and non-state actors; pursue advanced capabilities to understand and detect foreign nuclear weapons production and detonation; and maintain a cadre of highly skilled technical and scientific specialists trained, organized, and equipped to execute radiological/nuclear crisis response and consequence management missions worldwide.

The United States is working to regain its leadership role in the civilian nuclear energy industry. A strong domestic civilian nuclear enterprise improves America's national security through the development of safe and secure spent fuel disposition options and provision of safety, safeguards, export control, and security approaches for new reactor types, designs, and concepts.

- Ensure the readiness, capability, and swift execution of U.S.-led denuclearization efforts in countries of concern, as may be required by the President.
- Complete disposition of 162 metric tons of surplus U.S. highly enriched uranium by the end of FY 2019.
- Secure 2,346 of the estimated 4,000 known buildings containing high-priority radioactive materials by the end of FY 2019.
- Build capacity of the International Atomic Energy Agency (IAEA) to investigate indications of undeclared nuclear material and activities in states with comprehensive safeguards agreements, and work to universalize the Additional Protocol (AP).
- .* Advance, transition, or deploy new early proliferation detection and nuclear security technology against 80 percent of baseline targets.
- Continue to assess and improve radiological/nuclear crisis response and consequence management capabilities internally, and in collaboration with key strategic partners at the federal, state, territorial, tribal, and local levels.



Provide safe and effective integrated nuclear propulsion systems for the U.S. Navy:

Nuclear propulsion plays an essential role in the Navy's ability to conduct missions vital to national security. NNSA's Office of Naval Reactors (NR) is a joint Department of Energy/Department of the Navy organization responsible for ensuring the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers (constituting over 45 percent of the Navy's major combatants). NR is responsible for reactor plant design and development for the COLUMBIA-Class ballistic missile submarine, which will include a life-of-ship reactor core and an electric drive propulsion system that will enable it to support the sea-based leg of the triad through at least 2080. NR will refuel one of its land-based reactor plant prototypes in support of essential research and development efforts and nuclear operator training. It will also work toward the recapitalization of its over 60-year-old spent nuclear fuel infrastructure to ensure the flexibility needed to adjust to future mission demands.

- Continue design and development work for the COLUMBIA-Class submarine in support of long-lead time material procurement in FY 2019 and the initiation of ship construction in FY 2021.
- Start the refueling overhaul of a land-based prototype in 2019, which will recapitalize vital research and testing capabilities and train nuclear operators for the fleet.
- Begin construction of the Spent Fuel Handling Recapitalization Project in FY 2019.



Strengthen key science, technology, and engineering capabilities:

The nuclear weapons stockpile and key nonproliferation activities are supported by the technical expertise resident throughout our nuclear security enterprise. We keep our technical expertise at the cutting edge in manufacturing, diagnostics, evaluation, and in other areas at our plants and sites. In addition, we maintain unparalleled scientific capabilities in our Los Alamos, Lawrence Livermore, and Sandia National Laboratories that execute science-based stockpile stewardship, advanced manufacturing, laser science and optics, sensors and diagnostics, materials science, high-performance computing, and many other efforts of benefit to NNSA and DOE as well as other departments and agencies throughout the government and our nation. These capabilities and expertise are supported and strengthened by cross-disciplinary work in strategic partnerships projects (formerly known as work for others), commercialization, or transferring appropriate technologies to industry, academia, and other partners.

The science-based Stockpile Stewardship Program (SSP) has allowed NNSA and DoD to certify to the President since 1996 that the U.S. nuclear weapons stockpile remains safe, secure, and effective without the need for additional nuclear explosive testing. Continued investments in science-based stockpile stewardship are required to ensure responsiveness to changing threats and to develop options to ensure safety and security of future weapons. The impressive scientific achievements in stockpile stewardship have been realized by NNSA's most valuable resource, our workforce. Our ability to recruit, train, and retain the next generation of world-class scientists, engineers, and technicians is a major priority.

- Maintain state-of-the-art manufacturing technologies in support of our production operations.
- Advance the innovative experimental platforms, diagnostic equipment, and computational capabilities necessary to ensure stockpile safety, security, reliability, and responsiveness.
- Nurture Strategic Partnership Programs where other federal agencies and non-federal entities leverage the unique expertise and capabilities of the NNSA facilities in support of broader national security missions and needs while advancing the long-term capabilities and workforce of the national laboratories.
- Sustain active engagement and cost-sharing involvement with the private sector in early research and development (R&D) processes to accelerate deployment and realization of new technologies and provide an intrinsic technology transfer mechanism.
- Achieve exascale computing and deliver a capable exascale machine by the early 2020s.
- Ensure an enduring, trusted supply of strategic radiation-hardened microsystems beyond 2025.
- Develop an operational enhanced capability (advanced radiography and reactivity measurements) for subcritical experiments by the mid-2020s.
- Implement the Stockpile Responsiveness Program that fully exercises the workforce and capabilities of the nuclear security enterprise.



Modernize the national security infrastructure:

Our infrastructure has long been underfunded and overdue for the upgrades necessary to create a modern, robust, and resilient nuclear complex that can meet our national security missions today and into the future. We will revitalize and reinvigorate the facilities and corresponding infrastructure that make up the nuclear security enterprise and provide the leadership and resources to sustain it. With the assistance and support of Congress, we will be able to reduce deferred maintenance and modernize the nuclear security enterprise.

- Phase out mission dependency on Building 9212 at the Y-12 National Security Complex and deliver the Uranium Processing Facility for no more than \$6.5 billion by the end of 2025.
- Ensure long-term actinide chemistry and materials characterization by completing the Chemistry and Metallurgy Research Building Replacement project.
- Recapitalize pit production capability at Los Alamos National Laboratory and the Savannah River Site.
- Modernize lithium and tritium facilities.
- Recapitalize high explosive and nuclear weapons assembly infrastructure.
- Upgrade the reliability and capacity of electrical and water utilities to support NNSA's unique mission facilities.
- Modernize the Enterprise Secure Network infrastructure to enhance the NSE mission operations.
- Protect logical infrastructure against cybersecurity risks, including supply chain, insider threats, and advanced persistent threats.
- Provide modern office and laboratory spaces to recruit and retain the world-class workforce needed to maintain capabilities of the nuclear weapons stockpile.
- Deploy science-based infrastructure stewardship tools to make data-driven, risk-informed infrastructure investments and implement innovative solutions to deliver facility improvements better, faster, and more economically.
- Reduce deferred maintenance and repair needs by not less than 30 percent by 2025.
- Sustain and revitalize the enterprise to enable its ability to respond to ever-changing needs.









NNSA INITIATIVES FOR MEETING STRATEGIC CHALLENGES

NNSA faces strategic challenges in accomplishing our national security mission. As we have identified each of these challenges, we have undertaken effective initiatives to address them, leveraging our most precious and powerful resource—our people. While we may not be able to able to control every aspect of every challenge before us, we must focus on what we can change, maximizing the return on investment. This *Strategic Vision* lays out the path ahead. The *Governance & Management Framework* will make that path a lasting reality. The measure of our success will depend on every one of us in the enterprise believing in our capacity for change and acting on it. We owe it to every single American citizen today and for the next 75 years!

We have identified seven strategic management challenges that require immediate attention:

WORKFORCE: Our workforce is aging. Forty percent of our lab, plant, and site workforce will be eligible to retire within five years. At the same time as we expect our staff to attrite at high rates, our demand for skilled labor is increasing. Filling our open slots is a particular challenge because we have notably constraining requirements for obtaining security clearances and difficulty attracting those with the proper technical backgrounds. Many of our positions require prior experience to be able to perform specific functions. Balancing skill sets with the demand of serving in ancillary duties further complicates these factors. In addition, many of our workplaces are in poor condition, acting as a drag on recruitment. HQ, field, lab, plant, and site managers are recruiting aggressively, developing staff, and preparing succession plans to address our workforce issues. We have also undertaken an NNSA-wide corporate approach to recruiting our next generation workforce.

INFRASTRUCTURE CAPABILITY: Even as we work to modernize our infrastructure, we must continue to rely upon an enterprise whose buildings' average age is forty years old. The age and condition of our facilities impose risk to missions. Accordingly, we are prioritizing strategies to address our infrastructure challenge across the enterprise to assure continuity of mission. We remain vigilant, working both corporately and proactively. However, it is not enough to recapitalize our existing infrastructure but to anticipate and plan for the future of the enterprise.

SAFETY AND SECURITY: Notwithstanding the state of some of our aged facilities, we will maintain an unwavering commitment to health, safety, and security. Some perceive safety and security as competitors for mission achievement; we reject this perception. Instead, we believe safety and security are enablers to mission success. We understand that decrements in safety and security impart risks to achieving our mission.

STRATEGIC MATERIALS: The weapons and naval nuclear propulsion programs depend on secure supplies of and the ability to handle specialty materials. Principal among these are high explosives, tritium, lithium, uranium, and plutonium. All five sets of materials confront prospects of disruption to unavailability of materials or suitable facilities for handling them. We have plans to assure capability and capacities for such materials over the long term.

EMERGENCY MANAGEMENT: Past emergency management efforts have lacked coordination and focus. We will ensure a comprehensive and integrated approach to emergency management, including protection of the workforce, preparedness, response, recovery, and mitigation. We will ensure NNSA will be ready to respond promptly, efficiently, and effectively to any emergency involving or affecting the nation's interests.

INFORMATION TECHNOLOGY AND CYBERSECURITY: NNSA is on the front line of protecting information, systems, and networks necessary to execute our mission. As such, we are undertaking an aggressive enterprise transformation initiative that will deliver a modern, secure computing environment that improves communication and aligns with current and future Information Technology (IT) service delivery models. The enterprise-wide IT modernization initiative will provide innovative ways to consume, leverage, share, and safeguard information assets. We will improve the overall NNSA cyber posture to enhance secure and accessible IT solutions within and across NNSA sites. Additionally, we will identify and evaluate emerging technologies that can be used to strengthen NNSA's cyber defenses.

ACQUISITION: NNSA is a demanding customer, and we have a limited cadre of candidate companies, institutes, and universities to supply our contracting needs. These facts place continual pressures on our prospective contractors and our acquisition professionals to deliver best value for the nation. Approximately 90 percent of NNSA's federal funding is placed on contracts for services such as operating the NNSA National Laboratories. We will continue to compete M&O contracts on a 10-year cycle and evaluate prospective contractor partners based on past performance, leadership, small business participation, and taxpayer savings.

CONCLUSION

In assessing the mission of the NNSA, the return to great power competition coupled with an unprecedented range and mix of threats underscore the need for the United States to maintain a diverse set of nuclear capabilities that can provide flexible, tailored options to enhance deterrence and to achieve objectives, should deterrence fail.

The scientific and technological expertise found at NNSA's laboratories, production facilities, and sites is the intellectual backbone through which the United States can continue to deter adversarial aggression and preserve peace for our nation and our allies. At the same time, the complex and demanding geopolitical challenges we face are a constant reminder that we must maintain vigilance in our nonproliferation, counterproliferation, and counterterrorism efforts. NNSA is committed to: countering efforts to acquire, transfer, or use nuclear weapons-related technologies, materials, or expertise; responding to nuclear and radiological incidents around the world; countering the threat of nuclear terrorism; and seeking verifiable and enforceable arms control agreements that enhance global security.

Notwithstanding all these changes, the one constant we can expect is the urgency of our mission. Our Vision describes how NNSA will remain vigilant to assure the constancy of delivering our mission, despite the continually evolving environment, threats, and challenges we confront.





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