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Chairwoman Hartzler, Ranking Member Moulton, and Members of the Subcommittee, thank you for the opportunity to discuss the challenges and progress made by the Department of Energy's National Nuclear Security Administration (NNSA) in improving the state of NNSA's infrastructure. We recognize this Committee's leadership on this issue and appreciate its strong support for the mission and people of NNSA.

NNSA's diverse national security missions depend on its extensive, complex, and in many cases antiquated infrastructure, much of which dates to the Eisenhower Administration and, in some cases, the Manhattan Project era. As a result of the age of many facilities, operations are subject to increasing risk, as is the physical safety of our workforce. Moreover, current demands from NNSA's life extension programs (LEPs) and stockpile stewardship activities have increased pressure on this aging infrastructure. This is also true for the Office of Naval Reactors, which over the past 10 years has had to increase resource allocation to support aging facilities and infrastructure. This trend is expected to continue as it supports the upkeep and modernization of the Navy's nuclear fleet. As I've stated before this Committee and elsewhere, I can think of no greater threat to the nuclear security enterprise than the state of NNSA's infrastructure.

As of the end of FY 2015, NNSA's total deferred maintenance stood at $3.7 billion. Consequently, arresting the growth of deferred maintenance, gradually reducing it across the enterprise, and building new, modern facilities for our workforce have been among my highest priorities as Administrator. Specifically, NNSA is:

- Working closely with our congressional stakeholders at all stages of recapitalization projects;
- Improving practices to document NNSA infrastructure's condition and suitability to guarantee enhanced accuracy and comparability across sites;
- Enhancing infrastructure strategic planning to ensure it aligns with NNSA program plans, including those described in the *Stockpile Stewardship Management Plan* and the *Prevent, Counter, and Respond* report;
- Deploying new decision-making tools for more effective use of resources;
- Increasing resources for recapitalization, maintenance efforts, and line-item construction;

- Disposing of unneeded facilities where possible and addressing the risks posed by our highest-risk excess facilities; and
- Implementing improved project management systems and all appropriate acquisition options to ensure cost effective delivery of new construction.

In FY 2016, NNSA introduced and Congress supported an improved infrastructure budget structure that separates infrastructure maintenance and recapitalization from daily operations. The use of this new structure improves infrastructure stewardship by helping to limit the growth of deferred maintenance and emphasizing recapitalization to replace obsolete facilities. The focus on recapitalization further improves minor construction project management, and more detailed planning prior to project approval and execution creates smaller, one-to-two-year projects, easing our ability to track financial and schedule performance. NNSA has created standard prioritization criteria to better assess each project's relative importance to achieving program results and improving safety. With these improvements, NNSA completed 79 recapitalization projects with increased transparency to congressional stakeholders in fiscal years 2015 and 2016.

NNSA is also making significant progress in the disposition of excess facilities. In FY 2014 and FY 2015, buildings 9744 and 9808 at the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee were razed. In FY 2016, the Criticality Assembly and Storage Areas (CASA) 2 and 3 at the Los Alamos National Laboratory (LANL) in New Mexico were demolished. Provided funding is available, the Administration is preparing to deactivate and dispose of the Bannister Federal Complex in Kansas City, Missouri, in FY 2017. The plan for this project, which has been supported by all four of NNSA's authorizing and appropriating committees, will result in transferal of the property to a private developer for demolition, remediation, and redevelopment in August 2017. Assuming continued support and funding, this action alone will save as much as $700 million compared to the cost if the government were to complete the decommissioning on its own.

Broader Infrastructure Requirements

Addressing the extensive needs of NNSA's aging infrastructure requires sustained and strategic investments, which historically have not kept pace with the growing need to replace Cold War-era facilities. NNSA's nuclear security enterprise consists of three types of infrastructure: general purpose, programmatic, and security, all of which support mission work at acceptable levels of risk. NNSA's infrastructure in turn comprises two types of property – real property, such as buildings and building systems (e.g., heating, ventilating, and air conditioning, utilities, and roads), and personal property, (e.g., programmatic equipment, scientific tools, gloveboxes, and manufacturing equipment).

Strategic Materials Infrastructure

NNSA's Strategic Materials, which include plutonium, uranium, tritium, and lithium, are essential to the nation's nuclear deterrent and also contribute to its missions to reduce the risks of nuclear proliferation and nuclear terrorism. These materials require a highly skilled workforce

and significant programmatic infrastructure to ensure their long-term availability. Accordingly, NNSA is recapitalizing the facilities that support these materials with projects such as the Chemistry and Metallurgy Research Replacement (CMRR) project at LANL and the Uranium Processing Facility (UPF) at Y-12.

LANL performs analysis of the chemical and material properties of plutonium in the CMR Research building, a 1950s-era facility that is now at the end of its useful life. The Chemistry and Metallurgy Research Replacement project will move existing functions into newer, safer, and more efficient workspace. While the CMRR project ensures continuity in plutonium chemistry capabilities, it is only one part of a portfolio of plutonium investments. Reaching congressionally-mandated, Nuclear Weapons Council-endorsed pit production levels requires continued investment in production equipment and critical workforce skills through the Plutonium Sustainment program. In the next five years and beyond, Plutonium Sustainment program investments in these areas support efforts to reach near-term pit production goals of 10 pits per year in 2024, 20 in 2025 and 30 in 2026. In addition, NNSA is conducting an Analysis of Alternatives (AoA) to build the additional capacity we need to ramp up pit production capability to 50-80 pits per year, as required by the National Defense Authorization Act. We expect to have the results of the AoA by early this coming summer.

NNSA's uranium infrastructure spans several sites: uranium storage and processing mostly occurs at Y-12, with some R&D capabilities located at LANL, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory. NNSA is also reducing mission and safety risks at these facilities to ensure that long-term enriched uranium (EU) operations continue safely.

Under NNSA's Uranium Strategy, key uranium capabilities are being revitalized throughout the nuclear security enterprise. The construction of UPF at Y-12 is vital to modernizing NNSA's uranium infrastructure, providing critical capabilities to the nation's nuclear weapons program, nonproliferation missions, and Naval Reactors. NNSA is committed to ceasing EU programmatic operations in Y-12's Building 9212, a 1940s-era building, and delivering UPF by 2025 for no more than $6.5 billion.

Another core infrastructure activity is the Tritium Responsive Infrastructure Modifications Program underway at the Savannah River Site. In FY 2015, NNSA approved CD-0 for the Tritium Production Capability line-item project, which will reduce risks stemming from stockpile stewardship operations conducted in outdated facilities. Capabilities and processes related to loading of reservoirs with tritium are currently housed in the H-Area Old Manufacturing Facility, a 1950s-era building that does not meet current codes and standards. NNSA is nearing completion of the AoA, which will inform the conceptual design phase of the project. Alternatives considered include repair and upgrade of existing facilities, new construction, modification of existing facilities, and off-site capabilities.

Lithium is processed and stored at Y-12 in a Manhattan Project-era building that is well beyond its design life. The building has experienced rapid structural and process equipment degradation in the last 15 years. Direct material recycle is currently the primary source of lithium for

warhead LEPs. NNSA developed a bridging strategy to increase the supply of useable lithium and sustain the infrastructure needed to fabricate lithium components in our existing facility until the NNSA's Lithium Production Capability project re-establishes capabilities to purify lithium to meet the needs of NNSA and other government agencies.

Enterprise Security

During 2016, the Office of Defense Nuclear Security (DNS), with the assistance of the Center for Security Technology Analysis, Response, and Testing, conducted a site condition review to assess the state of physical security equipment (e.g., sensors, barriers, and cameras) and infrastructure (e.g., fiber optic wiring, lighting systems, and uninterrupted power source systems) across all NNSA sites. The review verified that much of the physical security infrastructure is well beyond NNSA's lifecycle and in need of refresh or replacement. The information gathered from this review was used to develop a strategy and schedule to refresh and replace the physical security infrastructure.

In addition, NNSA is pursuing new and emerging technologies through a Technology Gap Analysis and Insertion project to address existing and expected security system technology gaps. As these technologies mature, NNSA will approve and insert them into future iterations of this refresh plan. Where feasible, cost containment efforts will include competing the construction work needed to replace security infrastructure and strategic planning to minimize the footprint.

Deploying New Decision-Making Tools and Management Systems

NNSA's traditional measures of facility condition were based on financial metrics that did not capture the physical condition or the relative importance of the asset. To correct this deficiency, NNSA is moving to a risk-based model that evaluates each asset's ability to support core capabilities. As part of this effort, NNSA is implementing several new decision-making tools to make better data-driven, risk-informed management decisions. These new tools include: Enterprise Risk Management (ERM) – composed of the Mission Dependency Index (MDI) and BUILDER – and the G2 program management system.

NNSA started using an ERM methodology in 2015 to inform its programming decisions for future budgets, beginning with FY 2017. The ERM methodology uses MDI and BUILDER to provide a more accurate picture of where the enterprise currently stands and helps prioritize future investments. MDI combines the impact to the NNSA mission if the asset were lost, the difficulty of replacing the asset, and the interdependency of assets.

BUILDER is a Knowledge-Based Condition Assessment tool developed by the U.S. Army Corps of Engineers and recommended by the National Academy of Sciences. BUILDER will allow NNSA to better prioritize investment decisions based on current and future capability and capacity shortfalls. Specifically, the tool will:

- Standardize data collection and reporting on facility condition at the major building component level (e.g., roof, HVAC, structure), providing much greater insight into a facility's condition and its risk of failure;

- Allow NNSA to better predict repairs at the optimal time in each component's lifecycle, allowing us to proactively prioritize investments to quickly address necessary repairs; and
- Combine facility condition information with functionality information, which will determine a facility's ability to meet safety, operational, and mission requirements over time.

Additionally, NNSA issued a Safety, Infrastructure, and Operations Program Management Plan (PMP), which establishes program management processes and procedures, standardizes terminology, increases consistency in scope, schedule, and cost reporting, and improves transparency into direct and indirect funded infrastructure investments. The PMP is updated annually to incorporate lessons-learned through real world execution and experience. To support the new program management methodology, NNSA deployed the G2 program management system in FY 2015 to its infrastructure programs, which empowers Federal Program Managers and Management & Operating (M&O) contractors to manage at the program and project level with appropriate transparency and consistency. The system provides NNSA senior management with a common and transparent picture of the execution, budgeting, and allocation of NNSA's infrastructure investments. The G2 system also allows NNSA to holistically view and analyze infrastructure data in meaningful ways, such as advanced geospatial mapping.

NNSA is expanding on the success of its Roof Asset Management Program (RAMP) to address the needs of other common building components that can benefit from supply chain management efficiencies and lower repair costs. To date, RAMP has reduced deferred maintenance by $83 million and replaced nearly 5 million square feet of roofs across the enterprise. In FY 2015, NNSA expanded strategic procurements beyond RAMP to Cooling and Heating Asset Management (CHAMP) and plans to expand this approach to water systems in the future.

Most significantly, NNSA is developing its first-ever Master Asset Plan (MAP), which is scheduled to be released in tandem with the annual Stockpile Stewardship Management Plan this spring. The MAP is a strategic, enterprise-wide, risk-informed view of NNSA infrastructure that will be updated on an annual basis. The MAP will provide an integrated view of NNSA infrastructure and a prioritized infrastructure roadmap to reduce risks to mission execution in the near-, mid-, and long-term. Additionally, it will allow NNSA to evaluate the ability of infrastructure to support program requirements and will serve as the roadmap to meeting NNSA's infrastructure end vision.

Practices for Documenting Deferred Maintenance

In 2013, the Federal Real Property Council directed members to begin annual tracking and reporting of repair needs (i.e., correcting deficiencies to return an asset to its original condition), separate from deferred maintenance (i.e., correcting deficiencies that need to be performed to keep "fixed assets in an acceptable condition"). The tracking and reporting of repair needs allow Federal agencies to better quantify real property deficiencies. Accordingly, over the past two years NNSA worked with representatives from its sites to document a standard method for determining deferred maintenance and repair needs as a step to ensure standardized enterprise-wide reporting. Thus, at the end of FY 2015, deferred maintenance and repair needs were reallocated, and deferred maintenance was adjusted from $3.7 billion to $2.5 billion.

Fundamentally, however, the state of the infrastructure has not changed; the reduction resulted from a methodological shift, with approximately $1.2 billion of the $3.7 billion now categorized as repair needs.

During FY 2016, NNSA achieved the goal of halting the growth of deferred maintenance, which previously had been growing by hundreds of millions of dollars per year. Halting the growth of deferred maintenance is an important step, though much more needs to be done to maintain and modernize NNSA's infrastructure.

Improved Project Management

The NNSA Office of Acquisition and Project Management (APM) is driving continued improvement in contract and project management practices. This includes policies and procedures that institute rigorous AoAs; provide clear lines of authority and accountability for Federal and contractor program and project management; improve cost and schedule performance; and ensure that Federal Project Directors and Contracting Officers with the appropriate skills and professional certifications are managing NNSA's work. For example, NNSA established the Office of Project Assessments, reporting directly to the Principal Deputy Administrator, to ensure senior leadership visibility and accountability throughout the enterprise for project performance. This office generated significant savings in cost avoidances as a result of its independent project peer reviews.

Since 2011, NNSA has completed approximately $1.4 billion in projects, a portion of NNSA's total project portfolio, 8% under original budget. Using the Department's best practices, the UPF and CMRR projects were restructured into smaller, more manageable subprojects, significantly reducing project cost and delivery risk. FY 2017 will witness significant progress in the UPF Project, as NNSA is scheduled to achieve 90% design completion on the nuclear subprojects by the end of the year. Following this major milestone, NNSA will establish the final cost and schedule baseline for the UPF Project.

Capital Acquisition

NNSA will continue to focus on delivering timely, best-value acquisition solutions for all of our programs and projects, including non-traditional acquisition practices consistent with statutory authorities and Congressional Budget Office, Office of Management and Budget, and Budget Committee guidance as outlined in A-11 and A-94.

For example, in August 2014, NNSA achieved a major success with the construction of the state-of-the art Kansas City National Security Campus, a facility for the production of non-nuclear components for nuclear weapons in Kansas City, Missouri. The facility was built by a private developer and then leased to NNSA through the General Services Administration (GSA). This modern campus replaced an antiquated, World War II-era factory. The net result is a 50 percent reduction in our footprint in Kansas City, a $100 million a year savings to the U.S. Government in operating and maintenance costs, and significantly improved operational efficiency and workforce morale.

Additionally, in August 2016, NNSA broke ground on the Administrative Support Complex at the Pantex nuclear weapons assembly and dismantlement facility in Amarillo, Texas. There, our M&O contractor entered into a lease agreement for a new office building that a private developer will build using third-party financing. This project will allow roughly 1,000 employees to move out of dilapidated, 1950s-era buildings into a modern, energy efficient workspace. It will also eliminate approximately $20 million in deferred maintenance at the Pantex site and enhance recruitment and retention by improving the quality of the work environment. Through February 2017, we have completed design of the facility and launched several major construction activities, including installation of site utilities, concrete piers and structural steel to the top floor of the facility.

Where it provides best value for the government, NNSA is pursuing line-item capital construction projects such as the Albuquerque Complex. The current Albuquerque Complex, constructed in 1951, is well beyond its designed life and does not meet NNSA federal staff needs. With the continued support of Congress, we will deliver modern office facilities for the Albuquerque workforce while also disposing of the current complex.

To optimize this project, NNSA is leveraging the U.S. Army Corps of Engineers' broad experience in traditional line-item construction projects to act as both our design agent and construction agent. This cooperation builds on our previous experience using the Corps of Engineers as the construction agent for the High Explosives Pressing Facility at Pantex. The High Explosives Pressing Facility at Pantex received Critical Decision 4 (project completion) approval on February 28, 2017, and is turning over for operations now. Reaching this important project milestone is another example of modernizing our infrastructure and replacing antiquated facilities with modern, energy efficient, and safe structures. Its completion will allow for improved safety, security, and quality, and increased production efficiency of high explosives at the Pantex Plant.

Conclusion

Connecting our highly trained workforce with modern, cost effective, safe, and reliable infrastructure will ensure the success of our nuclear security mission. Our strategy for improving infrastructure is innovative and aggressive, it is moving NNSA through a new period in which infrastructure management receives a high-degree of attention that is commensurate with its importance to the nuclear security mission. This requires arresting the decline of NNSA infrastructure, reducing deferred maintenance, disposing of unneeded facilities, and continuing to improve the management of our infrastructure. We look forward to continuing to work with Congress on these and other important national security issues.