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Department of Energy
National Nuclear Security Administration
Office of the General Counsel
P.O. Box 5400
Albuquerque, NM 87185-5400

May 25, 2021

SENT VIA EMAIL

This letter is the final response to your May 23, 2020 Freedom of Information Act (FOIA) request. You requested the following:

> "A copy of the Questions For the Record (QFR) and agency QFR responses to Congress responding to QFRs during calendar years 2017, 2018, 2019 and 2020 to date, for NNSA."

Your request was received in this office on May 26, 2020. We contacted the National Nuclear Security Administration's (NNSA) Office of External Affairs (NA-EA), about your request. NA-EA searched and located sixteen (16) documents identified below.

Responsive Documents
The following documents are fully releasable and provided in their entirety.

- Doc 1 – 1.09.18 HEC-NA1 Hearing on DOE Modernization Final QFRs
- Doc 2 – 2.6.18 HEC NNSA Final QFRs
- Doc 3 – 3.28.19 SASC NA-1 QFRs
- Doc 4 – 05-08-2019 NNSA Only SASC-SF QFRs
- Doc 5 – 05-22-2018 Final HEC QFRs
- Doc 6 – 2017-03-16 Klotz HASC OI QFRs Final
- Doc 7 – 2017-03-16 McConnell HASC OI QFR Final
- Doc 8 – 2017-05-24 Final NNSA SASC-SF QFRs to Committee
- Doc 9 – 2017-05-25 Final NNSA HASC-SF QFRs to Committee
- Doc 10 – Final SEWD QFRs to Committee
- Doc 11 – 2018-03-14 Final NNSA SASC QFRs 8-9
- Doc 12 – 2018-03-20 NA-1 HEWD QFRs Final to HEWD
- Doc 13 – 2018-04-11 Final NA-1 SEWD QFRs 7-13
- Doc 14 – 2019-04-02 FY20 HEWD QFRs for NNSA Final
- Doc 15 – 2019-04-09 NNSA HASC-SF QFRs Final
- Doc 16 – 2019-09-25 NNSA HASC-SF QFRs Final

You may contact me, NNSA's FOIA Public Liaison, Office of the General Counsel, at 1-866-747-5994, or by mail at Department of Energy, National Nuclear Security Administration, Office of the General Counsel, PO Box 5400, Albuquerque, NM 87185, for further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, e-mail at ogis@nara.gov; telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

There are no fees chargeable to you for processing this request. If you have questions regarding this response, please contact Delilah Perez by email at Delilah.Perez@nnsa.doe.gov or write to the address above. Please reference Control Number FOIA 20-00166-M in your communication.

Sincerely,

Christina H. Hamblen
Digitally signed by Christina H. Hamblen
Date: 2021.05.25 16:48:33 -06'00'

Christina H. Hamblen
FOIA Officer

Enclosures

QUESTION FROM REPRESENTATIVE HUDSON

Under Secretary for Nuclear Security and Administrator of the National Nuclear Security Administration
General Frank G. Klotz

DOE Modernization: Advancing DOE's Mission for National, Economic, and Energy Security of the United States

Q1. We will hear testimony on the next panel about the need to manage long term change in the nuclear enterprise—and that managing change in an organization like the NNSA is difficult. The testimony indicates that DOE and NNSA have yet to develop a strategic plan to address longstanding accountability and management problems. If these problems are not addressed, they will contribute to the erosion of the nation's ability to maintain our nuclear deterrent.

Q1a. Will you talk about how you're working with the Secretary to make sure there is a strategic plan? And what you are putting in place to measure progress in making reforms?

A1. With the release of the December 2017 National Security Strategy and the February 2018 Nuclear Posture Review, it is imperative that we achieve modern, flexible, and resilient nuclear capabilities that are safe and secure in order to deter 21st century threats and reassure our allies. To meet this critical national security goal, in 2018, National Nuclear Security Administration (NNSA) is taking a holistic approach to strategic planning and is bringing together planning efforts for the nuclear security enterprise, including programmatic offices and the management & operating contractors. NNSA is ensuring that all strategic planning efforts complement one another and cascade from the Department's strategic plan where nuclear security goals and objectives are identified. Looking across the nuclear security enterprise, NNSA is examining the existing strategic and program plans and processes, in addition to laboratory plans, to ensure mission goals, effective management and oversight, and accountability are aligned and achieved.

In addition, a strong and healthy governance and management structure and culture are both critical for NNSA's continuing success in delivering on its national security commitments. Governance is implemented through a collaborative partnership between the Federal and contractor organizations to accomplish a common mission while preserving the Federal independence needed to effectively function in its self-regulatory role. NNSA is taking significant steps in adopting, implementing, and practicing an

improved governance structure, which will lead to an improved mission-focused, performance-based culture. NNSA has embraced three core principles to guide our governance reform efforts: (1) meet all national security mission objectives by enhancing mission awareness and integrating strategic planning and resource management; (2) continuously improve performance by establishing and emphasizing clear lines of authority and accountability and streamlining decision-making; and (3) build enduring and trusted partnerships by enhancing communication and strengthening collaboration. The effectiveness of NNSA measures to improve governance and implement the desired changes in NNSA's culture is already visible. Nevertheless, progress should continuously be assessed and effectiveness of reforms measured with a mind to long-term sustainability and lasting improvements in performance.

QUESTIONS FOR THE RECORD RESPONSES FROM ART ATKINS

QUESTION FROM CHAIRMAN FRED UPTON

Q1. Your testimony suggests review times for Part 810 specific authorizations have dropped from 18 to 12 months. Does this reduction in processing time include authorizations that are now deemed exports? If so, please do a side by side comparison that excludes the things that are now deemed exports.

A1. Average processing times for specific authorizations approved pursuant to 10 CFR Part 810 (Part 810) have decreased from a high of more than 18 months, which was the average processing time in Fiscal Year (FY) 2012, to the current average of approximately 12 months. These figures reflect all approved specific authorizations, including both deemed export applications and all other specific authorizations (referred to here as "regular exports"). Between FY 2012 and the present, the average time for approval of deemed exports decreased significantly, from 28 months to 11 months, while the average processing time for regular exports increased slightly from 15 months to 17 months.

These changes in average processing times are due to a number of factors. Processing times in FY 2012 for deemed export applications were high because the Department was in the process of determining the legal requirements and appropriate administrative procedures for authorizing this type of export. These processing times began to decrease once the Department finalized the procedures, which allow for foreign nationals working for U.S. companies to be granted specific authorizations under Part 810 on the basis of a nondisclosure agreement signed by the individual, rather than a written assurance from their government, which had been required previously. Foreign governments often are hesitant to provide such assurances for individuals who live and work outside of their borders.

With regard to regular export authorizations, processing times have increased for a variety of reasons, including new provisions in the FY 2016 National Defense Authorization Act that require the Office of the Director of National Intelligence to review all proposed transfers to China and Russia. While this requirement applies to both deemed and regular exports, deemed exports to Chinese and Russian citizens are relatively rare, so the new requirement has had a much larger impact on the processing times for regular exports. Additionally, approval times

were further impacted by ongoing policy reviews, and the time required to obtain government-to-government nonproliferation assurances.

As discussed below, the Department is currently implementing a number of actions that will reduce processing times for both deemed and regular exports, while maintaining strong nonproliferation controls on U.S. nuclear technology.

Q2. During the hearing you noted that DOE is looking at actions that can reduce processing times, such as providing the Secretary the authority to approve authorizations contingent on receiving assurances from the Department of State. Please provide further detail regarding the prospective policy changes the Department is considering improving the efficiency of specific authorization approval, including expected timeframes and milestones.

A2. As part of the implementation of the Department of Energy (DOE)'s Part 810 Process Improvement Plan, the Department is taking a number of steps to reduce processing times and improve efficiency and transparency. First, DOE is modifying the Part 810 review process so that most of the required DOE reviews of applications for specific authorization can be conducted in parallel with the Department of State's (DOS) effort to obtain nonproliferation assurances from the foreign government that would receive the technology. Under the revised process, however, applications will not be sent to the National Nuclear Security Administration (NNSA) Administrator or Secretary of Energy, until the application package is complete, including a final DOS concurrence and the associated government-to-government nonproliferation assurance. DOE expects to begin implementing parallel processing starting with the next application for specific authorization that is received. Moving forward, DOE will also continue to work with DOS on options to reduce the time required to obtain nonproliferation assurances from foreign governments.

Second, DOE is working to establish timely yet realistic deadlines for internal review of Part 810 applications. This will further reduce processing times by holding offices accountable for meeting specified review timelines, and will improve the predictability of the application review process for applicants. DOE is finalizing the review deadlines now and expects to have them in force within the next several weeks.

Third, DOE is enhancing the functionality of e810, an electronic submissions portal for Part 810 applications and reports that was made available to exporters in January 2017 to streamline the application process and increase transparency for applicants. By March 2019, DOE will release e810 Phase 2, which will include new functionality for electronic review of documents by DOE and the interagency. This will make it easier for DOE to track the progress of reviews and will enable regular, automated status updates to applicants. Subsequently, DOE will begin development of e810 Phase 3, which will add detailed reporting functionality to the system. The Phase 3 system update is planned for release by March 2020.

In addition to these ongoing process improvement initiatives, DOE is reviewing additional options that would further reduce processing times and enhance compliance and monitoring.

Q3. Your testimony noted that NNSA is "looking at capability to meet High-assay LEU" for commercial needs. Will you please describe the nexus between NNSA's material management and opportunities to provide high-assay LEU for commercial purposes?

A3. NNSA is responsible for managing the United States' inventory of enriched uranium to ensure that it is used effectively. Due to the limited supply of enriched uranium, and projected future demands for both government and commercial use, NNSA is also working within the broader DOE to explore the establishment of a domestic enrichment capability.

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QUESTION FROM SENATOR JACK REED

Office of Cost Evaluation and Program Execution

Q4. Secretary Gordon-Hagerty, in the Fiscal Year (FY) 2016 NDAA [National Defense Authorization Act] we created an Office of Cost Estimating and Program Evaluation (CEPE) much like the DOD [Department of Defense] has with the Office of Cost Analysis and Program Management (CAPE). This was after years of having programs at the NNSA [National Nuclear Security Administration] exceed their estimates. Their job is to be the counter-balance directly to you on the program managers who might be too optimistic. Are you ensuring they have the proper staff and resources to carry out their mission?

A4. The Office of Cost Estimating and Program Evaluation (CEPE) is key to meeting the Mies-Augustine Report recommendation that NNSA establish a trusted cost and resource analysis capability. NNSA is committed to ensuring CEPE has sufficient staff and resources to fulfill its statutory responsibilities and to provide a trusted cost and resource analysis capability.

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QUESTIONS FROM SENATOR RICHARD BLUMENTHAL

QUESTIONS FROM SENATOR TIM KAINE

Decommissioning of USS Harry S. Truman

Q15. Secretary Gordon-Hagerty, have you been given any direction from the Department of Defense to commence planning or provide funding for the decommissioning of the aircraft carrier USS *Harry S. Truman*?

A15. No, NNSA has not been given direction by the Department of Defense related to the decommissioning of the USS HARRY S. TRUMAN. The Department of the Navy is responsible for the planning and budgeting to support a nuclear ship's refueling complex overhaul or its inactivation.

Q16. Secretary Gordon-Hagerty, what would be the impact to future DOE [Department of Energy] budgets if the Navy were to go through with the early decommissioning of the *Truman*?

A16. There will be no impact to NNSA's budget if the USS HARRY S. TRUMAN is retired early. The Department of the Navy is responsible for the planning and budgeting to support a ship's refueling complex overhaul or its inactivation.

Q17. Secretary Gordon-Hagerty, when would planning and funding need to commence if the decommissioning were to start in FY24?

A17. The Department of the Navy is responsible for the planning and budgeting to support a ship's refueling complex overhaul or its inactivation. The Deputy Administrator for the Office of Naval Reactors is responsible for ensuring safe and effective nuclear propulsion plants for the Navy's fleet of submarines and aircraft carriers, to include the USS HARRY S. TRUMAN. Naval Reactors remains engaged in discussions with the Navy

on retaining this aircraft carrier through its remaining service life based on recent announcements by the Administration.

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QUESTIONS FROM SENATOR MARTIN HEINRICH

FY20 Budget Request for Plutonium Sustainment

Q21. Secretary Gordon-Hagerty, can you please provide a breakout of proposed scope of work for FY20 at LANL under NNSA's budget request for plutonium sustainment, including LANL's support for establishing the capacity to produce plutonium pits at Savannah River Site?

A21. In the Fiscal Year (FY) 2020 budget request for LANL, Plutonium Sustainment Operations provides funding to hire, train, qualify, and retain required pit production personnel at LANL; recapitalize equipment needed to restore Plutonium Facility (PF)-4's ability to produce 10 war reserve pits per year by 2024; and support production activities. The Savannah River Plutonium Processing Facility Project element of Plutonium Sustainment Operations in the FY 2020 budget request invests in completing conceptual design to repurpose the facility for pit production and supports developing other project documentation required for Critical Decision-1. LANL is providing expertise and design support for conceptual design of special facility equipment for this project.

Savannah River Plutonium Processing Facility

Q22. Secretary Gordon-Hagerty, can you please provide your current best estimate of the schedule and timeline of the major milestones, including NEPA [National Environmental Policy Act] review, to establish the capacity to produce 50 plutonium pits per year in the re-purposed MFFF?

A22. NNSA is currently executing conceptual design activities for the proposed Savannah River Plutonium Processing Facility (SRPPF) to produce 50 pits per year. An independent cost estimate for refurbishment of the proposed SRPPF will be done prior to Critical Decision-1. Consistent with the National Environmental Policy Act (NEPA) and

pursuant to 10 CFR 1021.311, NNSA is preparing an environmental impact statement (EIS) for the proposed action to repurpose the Mixed Oxide Fuel Fabrication Facility to produce a minimum of 50 pits per year at the Savannah River Site (SRS). On June 10, 2019, the Office of the Federal Register published a Notice of Intent to prepare an EIS on plutonium pit production at SRS. NNSA expects the draft EIS to be available in 2020.

Pit Production at LANL

Q23. Secretary Gordon-Hagerty, I understand Los Alamos has been making steady progress in restoring the capacity to produce plutonium pits in PF-4. What is the current status of the effort to produce development W87-like pits are you satisfied with the progress being made to begin pit production in PF-4?

A23. NNSA remains committed to achieving pit production requirements established by the Nuclear Weapons Council (NWC) to produce the first war reserve (or W87-like) pit in 2023, 10 war reserve pits per year in 2024, 20 war reserve pits per year in 2025, and 30 war reserve pits per year beginning in 2026 at LANL. LANL has demonstrated progress in meeting these goals and fabricated four development pits in FY 2018, is fabricating five development pits in FY 2019, and plans to produce five process prove-in pits in FY 2020.

Upgrade of MESA at Sandia Labs

Q25. Secretary Gordon-Hagerty, for over 30 years the MESA [Microsystems Engineering, Science and Applications] facility at Sandia Labs in Albuquerque has been a real workhorse for meeting NNSA's unique requirements for strategic rad-hard microelectronics. The aging facility is outdated and unable to support adequately life-extension programs in the post-2025 timeframe. Upgrading MESA will require a major infrastructure investment. What is the current strategy and plan to sustain the unique

capabilities of Sandia's MESA Complex to produce strategic rad-hard microelectronics beyond 2025?

A25. NNSA is committed to sustain the MESA Complex through 2040. Sandia National Laboratories' (SNL) Microsystems Engineering, Science, and Applications (MESA) Complex currently is the only U.S. foundry with the capability to deliver custom strategically radiation-hardened microelectronic components required to sustain the Nation's nuclear deterrent. NNSA recognizes the distinguished capability provided by SNL and, over the last several years, NNSA has worked to assess the long-term viability of the MESA Complex to provide war reserve components that meet system requirements. As the Silicon Fabrication (SiFab) foundry surpassed its 30-year intended life, NNSA and SNL contracted Aerospace Corporation and Longenecker Associates to conduct independent risk assessments. Both concluded that the foundry can be extended until 2040 with modest upgrades to infrastructure and equipment.

NNSA and SNL have partnered in the development of an Extended Life Program (ELP) to understand investments required to sustain the existing capabilities of the MESA Complex. The ELP plan will provide a 20-year forecast of tools and equipment recapitalization, and facilities and infrastructure projects.

NNSA and SNL are also partnering in the development of the MESA Integrated Program Plan, which will provide a 5-year view of operations, weapons program commitments, and operational costs, to include the budgeting information for maintenance of capability, R&D programs, production programs, and technology maturation activities.

Q26. Secretary Gordon-Hagerty, what are the specific milestones you are planning for the upgrade this year and for fiscal year 2020?

A26. NNSA has worked closely with Sandia National Laboratories to generate a facility project schedule that poses minimal risk to the Life Extension Programs (LEP) production schedule. Based on the complexity and age of MESA, facility projects must be prioritized and executed based on areas of highest need to avoid extended shutdowns of production fabrication, and with consideration for the quality of the systems supporting production, e.g., cleanliness of deionized water, air quality, and regulation of airflow. FY 2019 and FY 2020 maintenance projects and associated improvements to the MESA facility include enhancements to the bulk chemical distribution system; Silicon Fabrication Facility (SiFab) Uninterruptible Power Supply system upgrades; commencing a 3-year SiFab HEPA filter and bay ceiling replacement project; and structural upgrades to support packaging equipment for the W80-4 LEP.

LEP Workload at NNSA Labs and Plants

Q27. Secretary Gordon-Hagerty, the ongoing Life-Extension Programs (LEP) are essential to assuring the stockpile is safe, secure and reliable. I believe the LEPs are a top priority. You currently have four major LEPs underway: B61, W88, W80-4 and W87-1 with about $2 billion in required work per year. Are you confident that the NNSA's labs and sites have sufficient capacity needed to perform this critical work, and stay on the schedule and budget for each LEP?

A27. We are confident that we have sufficient capacity to execute these modernization activities. However, significant technical issues can arise that have the potential to affect LEP schedules and budget. For example, NNSA is assessing the impacts of a technical component that did not pass qualification testing and is common to several components on the B61-12 LEP and W88 Alt 370.

Future of Pulsed Power and Z Machine at Sandia National Laboratories

Q28. Secretary Gordon-Hagerty, the Z Machine at Sandia Labs continues to provide one of the critical pieces of our stockpile stewardship program by simulating pressures and radiation

environments that previously required underground testing. Do you agree that pulsed power science is important to NNSA's mission, and what do you see is the future role of pulsed-power science for mainting the strategic deterrent?

A28. Pulsed power capabilities are key to supporting weapon survivability and radiation effects, materials science, and thermonuclear burn. Given the promise demonstrated by pulsed power and magnetic drive in recent years, the work at the Z Pulsed Power Facility has been prioritized within the Inertial Confinement Fusion Program. NNSA plans continued increases in its investment in pulsed-power science to capitalize on recent advances in fusion concepts, which may provide high neutron yields and meet national security needs without requiring fusion ignition.

Q29. Secretary Gordon-Hagerty, in light of the recent article in the *South China Morning Post* concerning China's future plans for pulsed power, what are your thoughts on the need to extend the laboratories' capabilities in pulsed power science to support stockpile stewardship?

A29. The priority for the next fiscal year is the completion of the Inertial Confinement Fusion 2020 goal, which includes the development of credible physics scaling to multi-megajoule fusion yields for each of the ignition approaches. The conclusions of this study will be used to guide future research and facility investments. The 5-year experimental plan initiated in FY 2019 includes activities that will explore the mission need for next-generation facilities and identify the best approaches.

Q30. Secretary Gordon-Hagerty, are there risks to the U.S. deterrent if adversaries advance major scientific capabilities in pulsed power beyond what the national labs currently have today?

A30. NNSA continuously assesses and manages the full breadth of risks to the deterrent, including the impact of new technical capabilities of our adversaries. As we monitor global scientific advances, we will continue to use our full suite of tools to ensure the

safety, security, and effectiveness of our nuclear arsenal, including possible investments in new capabilities as appropriate.

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QUESTIONS FROM SENATOR JOE MANCHIN III

Nuclear Material Security and Theft Prevention Programs

Q57. Secretary Gordon-Hagerty, under the previous and current administration's budget requests for NNSA led nuclear theft prevention programs have been declining over the years as well as actual funds being appropriated. Current funding levels are at their lowest since the early 1990s and even after the most recent Nuclear Posture Review noted that nuclear terrorism is one of "the most significant threats to the security of the United States." The Fiscal Year 2019 and current budget requests have suggested cuts to domestic and international radiological security, nuclear smuggling and deterrence, security at nuclear facilities, and efforts to consolidate and remove nuclear weapons usable materials. Can we count on the NNSA to partner with the Senate Armed Services Committee and other relevant Committees to identify the risks we face domestically and internationally so we can correctly allocate resources to the applicable programs responsible for preventing radiological materials theft and preventing terrorism incidents?

A57. NNSA values its partnership with the Senate Armed Services Committee and other Committees on nuclear security. NNSA will continue to work diligently with Congress to ensure that any and all risks domestically and internationally are identified and appropriate resources allocated to support our nuclear security priorities.

Q58. Secretary Gordon-Hagerty, what efforts are the NNSA undertaking with international partners to consolidate nuclear weapons usable materials to the minimum practical number of locations to maximize security and effectiveness of resources?

A58. NNSA has worked with 48 countries and Taiwan to minimize the amount of weapons-usable nuclear material at civilian sites by consolidating these materials at fewer sites—and where possible—eliminating them, for example by downblending highly enriched uranium (HEU) to low-enriched uranium. Recent and near-term activities include making Ghana and Nigeria HEU-free by returning Chinese-origin HEU from these countries to China; eliminating all HEU from the Institute of Nuclear Physics in Alatau,

Kazakhstan; and working with Canada, the United Kingdom, Japan, and other partners to eliminate excess HEU from a number of other facilities.

Q59. Secretary Gordon-Hagerty, the Department of Energy's Fiscal Year 2020 Budget Request suggests cutting the Global Material Security budget by $65 million. As you are aware, the Global Material Security plays an important role in permanent threat reduction and working closely with international partners to interdict illicit nuclear materials that could be used in a non-state actor attack. Do you agree that this program is critical for maintaining U.S. nuclear security leadership and preventing potential theft and illicit use of such materials?

A59. The President's FY 2020 budget request supports the Global Material Security mission of preventing terrorists and other actors from obtaining nuclear and radioactive material that could be used in an improvised nuclear device or a radiological dispersal device. This work, which is critical to our national security and to NNSA's efforts to reduce global nuclear security threats, is fully supported by the FY 2020 budget.

FY 2019 appropriations included an increase above the budget request for Global Material Security. This allowed NNSA to accelerate a number of activities that had been planned for FY 2020, including procurements to support the replacement of cesium-based irradiators, the development of transportation containers to remove disused cesium-based irradiators, and activities to secure buildings with radioactive material. The increase also allowed for the acceleration of counter nuclear smuggling efforts near unofficial border crossings, targeted operations along air traffic and unregulated maritime pathways, and with interior security services. All of these important efforts will continue in FY 2020.

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Nuclear Enterprise Security

Q60. Secretary Gordon-Hagerty, many U.S. partner countries have limited experience with vulnerability assessments that test for areas that an adversary may be able to exploit security systems and/or testing "force on force" exercises at borders or at facilities that house sensitive materials. What activities or partnerships is the NNSA leading to ensure our international partners have the training to properly asses and build awareness around their security practices?

A60. NNSA works on a bilateral and multilateral basis with partner countries across the globe to prevent the theft, sabotage, and diversion of nuclear material. NNSA pursues this mission in concert with technical experts from the National Laboratories.

NNSA has extensive experience working with partner countries in developing vulnerability assessments to ensure the effectiveness of physical protection systems for nuclear material. Additionally, NNSA conducts force-on-force trainings for foreign response teams at domestic and international training facilities and transport security trainings for foreign police organizations. NNSA also provides physical protection upgrades on a case-by-case basis, and assists partner countries in building capacity in critical areas such as cybersecurity and insider threat mitigation.

Q61. Secretary Gordon-Hagerty, the International Atomic Energy Agency maintains an Incident and Trafficking Database, which compiles information from participating member states on incidents such as loss or theft of radioactive materials. Does the NNSA maintain any a similar database and is it accessible by other agencies and by international partners?

A61. NNSA maintains an internal list of detections of nuclear and radioactive material gathered both from open source reports, including the Incident and Trafficking Database (ITDB), and from our bilateral partnerships with foreign governments. Information

reported to NNSA by international partners is used for internal project assessment, planning, and prioritization. NNSA also encourages its partner countries to report incidents to the ITDB. In addition, NNSA closely collaborates with other appropriate U.S. interagency partners on detections of concern to ensure a consistent whole-of-government effort in counter nuclear smuggling.

Nuclear Enterprise Cybersecurity

Q62. Secretary Perry and Secretary Gordon-Hagerty, the budget request you presented shows a 39.9-percent increase in Information Technology and Cybersecurity funding for the National Nuclear Security Administration. USSTRATCOM [U.S. Strategic Command] is also in the process of modernizing cybersecurity as a part of an overall effort to modernize nuclear command, control and communications. Are DOE and DOD engaging in any cooperative efforts regarding nuclear cybersecurity in order to avoid duplication of efforts or systems that lack interoperability?
A. Secretary Gordon-Hagerty
B. Secretary Perry

A62. NNSA and DoD are strategic partners and continuously engage in various activities. NNSA's Office of the Chief Information Officer (OCIO) currently works with NNSA's Office of Defense Programs and the Office of the Under Secretary of Defense for Policy on cybersecurity, information technology, and operational technology for weapons activities. The Nuclear Enterprise Assurance Steering Group (NEASG) is the senior DOE/DoD management body that oversees, coordinates, and shares lessons learned that will improve the country's ability to prevent adversarial threats against nuclear weapon systems. This collaboration allows us to maintain communication and engage in any cooperative efforts regarding nuclear cybersecurity, where opportunities exist.

QUESTION FROM SENATOR MARTIN HEINRICH

Work Balance between Los Alamos and Livermore Labs

Q1. Administrator Gordon-Hagerty, Livermore will be leading the work on the W80-4 cruise missile warhead and the W87-1 Inter-continental Ballistic Missile (ICBM) warhead. Meanwhile, Los Alamos is finishing work on the B61-12. In the future, how will you balance work for Los Alamos for design and engineering given Livermore has the bulk of the work for the next 10-15 years?

A1. The national laboratories have managed varying life extension program (LEP) workloads in the past and maintained their modernization skills. This is now reinforced by initiatives like the Stockpile Responsiveness Program and the important peer review work done across the nuclear security enterprise. There is still a significant amount of LEP work to be conducted at Los Alamos National Laboratory, as well as future LEP requirements and other initiatives such as the recapitalization of a pit production capability. Additionally, design and engineering capabilities continue to be utilized at both labs as these activities are required for the day-to-day maintenance and minor alterations and modifications needed to keep the stockpile in a ready-for-deployment status.

QUESTION FROM SENATOR MARTIN HEINRICH

NNSA Strategic Vision 2018

Q2. Administrator Gordon-Hagerty, this week the National Nuclear Security Administration (NNSA) released the Strategic Vision 2018, which is in response to the findings of the Augustine – Mies Congressional Commission on the Governance of the Nuclear Enterprise. Chapter one of the report presents a clear and implementable vision for the organization – one that changes its culture. How do you intend to implement and track this Strategic Vision document to promote the change in culture of a mission driven organization?

A2. In association with the release of the *Strategic Vision*, NNSA also released the *Governance and Management Framework* and the *Strategic Integrated Roadmap*. The *Governance and Management Framework* shows how the agency will deliver its mission in a resilient, agile, and responsive manner. The *Strategic Integrated Roadmap* illustrates the path to achieving goals now through the next 25 years. Collectively, the three documents set the stage for realizing the cultural changes necessary to ensure that NNSA continues to demonstrate excellence and is responsive to the nation's nuclear security and strategic defense needs now and into the future.

Issuing these documents alone does not transform NNSA. Doing so requires leadership, training, dedication, and ongoing communication. NNSA will work together as one team by drawing upon common values across the nuclear security enterprise, building enduring and trusted relationships, promoting transparency, fostering a passion for and awareness of mission, and demonstrating a commitment to success at all levels. NNSA is poised to continue making essential contributions to U.S. and global security now and into the future.

QUESTION FROM SENATOR MARTIN HEINRICH

Surplus Plutonium Dilute and Dispose – Los Alamos National Laboratory

Q3. Administrator Gordon-Hagerty, my understanding is that to perform the dilute and dispose operations for surplus plutonium in later years you intend to ship plutonium from Pantex to Los Alamos National Laboratory (LANL) to turn it into oxide power. Then, you will ship it to the Savannah River Site to be packed; and then, ship it again back to Carlsbad, New Mexico to be disposed of at the Waste Isolation Pilot Plant. Is this truly the optimal strategy and have you considered alternatives that could reduce the number of required shipments?

A3. NNSA has previously and will continue to evaluate opportunities to improve the efficiency of the dilute and dispose process, including optimizing transportation requirements.

QUESTION FROM SENATOR MARTIN HEINRICH

Surplus Plutonium Dilute and Dispose – Los Alamos National Laboratory

Q4. Administrator Gordon-Hagerty, looking at your planned plutonium funding for fiscal years 2020 through 2024, I note there are increased operations for Los Alamos' plutonium facility to dilute and dispose of the 34 metric tons of surplus plutonium that was to go to the Mixed Oxide (MOX) facility, while at the same time we are increasing operations for pit production in PF-4. Can all of these tasks be done effectively in the plutonium facility? How is this work being coordinated?

A4. Los Alamos National Laboratory (LANL) is aware of the need to maintain dilute and dispose (D&D) activities and has incorporated D&D plans into the overall site strategy for plutonium that is currently under development. LANL is developing an integrated schedule for all Plutonium Facility (PF)-4 activities to balance resources among all the programs that PF-4 supports.

QUESTION FROM SENATOR MARTIN HEINRICH

Surplus Plutonium Dilute and Dispose – Los Alamos National Laboratory

Q5. Administrator Gordon-Hagerty, is it true you are going to have to add another entrance into the plutonium facility to accommodate both dilute and dispose and pit production?

A5. NNSA is working with Los Alamos National Laboratory to evaluate the investments needed to support increased operations at Plutonium Facility (PF)-4 to meet pit production requirements and other missions. With an increased operational tempo, there will be a need to accommodate additional staff in PF-4. Updated staffing analyses will inform the basis for personnel-related infrastructure such as offices, parking, training, and entry control capabilities.

QUESTION FROM SENATOR MARTIN HEINRICH

NNSA's Plutonium Strategy and the Institute for Defense Analysis's Assessment for the Department of Defense

Q6. Administrator Gordon-Hagerty, with respect to your recommended alternative for plutonium pit production announced in May 2018, I continue to have serious concern over the substantially higher estimated lifecycle cost of establishing a second site to produce 50 pits year by 2030 compared to enhancing the current capabilities at Los Alamos. What is the status and timeline to complete the conceptual design to repurpose the Mixed Oxide Fuel Fabrication Facility for pit production and to approve the selected alternative and updated cost range, including lifecycle cost, to support CD-1?

A6. To achieve DoD's requirement of not less than 80 pits per year by 2030, NNSA's recommended alternative repurposes the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site in South Carolina to produce plutonium pits while also producing pits at Los Alamos National Laboratory (LANL) in New Mexico. Though we expect the lifecycle cost of a two-site approach to be higher than that of a one-site approach, the recent Institute for Defense Analyses (IDA) study noted that this gap in costs would be reduced when accounting for the cost to maintain the aging Plutonium Facility (PF)-4 and the cost of additional LANL personnel. Additionally, the proposed two-site approach supports the need for resiliency, flexibility, and redundancy across the nuclear security enterprise for the critical plutonium pit production mission by not relying on a single production site.

NNSA is currently executing conceptual design activities for the proposed Savannah River Plutonium Processing Facility (SRPPF) to produce 50 pits per year, with a goal of achieving Critical Decision-1 (CD-1) by September 30, 2020. An independent cost estimate for refurbishment of the proposed SRPPF will be performed prior to CD-1.

QUESTION FROM SENATOR MARTIN HEINRICH

NNSA's Plutonium Strategy and the Institute for Defense Analysis's Assessment for the Department of Defense

Q7. Administrator Gordon-Hagerty, when completed, will you provide the Armed Services Committees notification of the approval of the selected alternative and the updated cost range?

A7. Yes, when Critical Decision-1 is approved, NNSA will notify the Committees of the approval of the selected alternative and the updated cost range.

QUESTION FROM SENATOR MARTIN HEINRICH

NNSA's Plutonium Strategy and the Institute for Defense Analysis's Assessment for the Department of Defense

Q8. Administrator Gordon-Hagerty, it is clear that the key milestone in NNSA's plutonium strategy is achieving 30 pits per year at Los Alamos. However, the Institute for Defense Analysis's recent independent assessment for the Department of Defense (DOD) presents a rather sobering and pessimistic view of the overall plutonium strategy. The key findings include: none of the four options NNSA considered to reach 80 pits was demonstrably better; each is achievable but not on the schedule or budget currently forecast; and none of the options can provide the 80 pits per year DOD requires by 2030. What is your assessment of the report with respect to the ability of any of the four options considered by the NNSA to produce 80 pits per year by 2030?

A8. NNSA realizes that production of not less than 80 pits per year (ppy) by 2030 is an ambitious goal, but we remain committed to meeting the requirement laid out in the 2018 Nuclear Posture Review. The Institute for Defense Analysis (IDA) study based its conclusion that NNSA cannot reach the 80 ppy milestone in 2030 with any of the proposed options on the history of recent large construction projects within DOE. On that comparative basis, IDA could find no example of a project on the same scale as pit manufacturing being completed in the time frame we need. It is also worth noting that IDA could not find an example of repurposing an existing facility as a comparison; their assessment was based only on large construction projects that involved new construction. These past projects do not reflect the fact that DOE has incorporated lessons learned from life extension programs and capital construction projects as well as improved program management processes to facilitate execution of projects on schedule and within budget.

QUESTION FROM SENATOR MARTIN HEINRICH

Plutonium stored at the Nevada National Security Site

Q9. Administrator Gordon-Hagerty, my understanding is Secretary Perry has assured the Nevada delegation the NNSA will begin removing the half-ton of Savannah River plutonium from Nevada by 2021. In addition, Secretary Perry has indicated the second half-ton of plutonium will not be shipped from South Carolina to Nevada. Can you tell us in open session where this plutonium is headed?

A9. No, pursuant to the Atomic Energy Act (AEA), the Department of Energy is charged with safeguarding national security information related to the shipment of special nuclear material. As the material removed from the Savannah River Site will be used for national security missions, details of the campaign are classified, in accordance with the AEA.

QUESTION FROM SENATOR MARTIN HEINRICH

Molybdenum 99 from Low Enriched Uranium

Q10. Administrator Gordon-Hagerty, the American Medical Isotopes Production Act of 2012 directed NNSA to implement a technology-neutral program, in cooperation with non-Federal entities, to produce molybdenum-99 without using highly enriched uranium (HEU). The NNSA should take a lot of credit for working with industry to develop a domestic supply of the medical isotope, Mo-99, using only low-enriched uranium. In February, NNSA completed its evaluation of applications submitted in response to a funding opportunity for the production of Mo-99 without the use of HEU. What is the status of the negotiations with the four U.S. companies selected for new cooperative agreement awards to produce Mo-99?

A10. Currently, NNSA is reviewing the proposed budgets for the four potential vendors to include a review of pricing and cost reasonableness; total budget cost; and an assessment of costs proposed, to ensure costs are allowable under Federal Acquisition Regulation. Concurrently, NNSA is preparing contract documents in anticipation of four awards.

QUESTION FROM SENATOR MARTIN HEINRICH

Molybdenum 99 from Low Enriched Uranium

Q11. Administrator Gordon-Hagerty, how soon do you anticipate domestic production of Mo-99 will begin?

A11. NorthStar began domestic production of Mo-99 in November 2018.

QUESTION FROM SENATOR MARTIN HEINRICH

Molybdenum 99 from Low Enriched Uranium

Q12. Administrator Gordon-Hagerty, are we on track to eliminate the use of highly enriched uranium for radioisotope production in the United States and overseas?

A12. Yes, we are on track to eliminate the use of highly enriched uranium (HEU) for radioisotope production. The first domestic producer in the United States in 30 years, NorthStar, began production in November 2018 with non-HEU technology. Three of four major global suppliers now produce with low-enriched uranium (LEU). The fourth, Belgium's Institute of Radioelements, plans to convert to 100 percent LEU by June 2022.

QUESTION FROM SENATOR MARTIN HEINRICH

Domestic Uranium Enrichment

Q13. Administrator Gordon-Hagerty, since the closure of the Paducah Gaseous Diffusion Plant in 2013, the United States has lacked the capability to enrich uranium using a domestic technology. The Department of Energy (DOE)/NNSA requires unobligated enriched uranium to meet stockpile requirements, fuel reactors that produce tritium, and power the nuclear Navy. In rough terms, about how many years will the existing inventory of enriched uranium, including HEU, provide NNSA to extend the need date for unobligated low enriched uranium for tritium production and other purposes?

A13. NNSA's nearest-term need for unobligated low-enriched uranium (LEU) is to fuel tritium production reactors. NNSA is currently executing a campaign to down-blend highly enriched uranium materials from the existing uranium inventory, which will provide enough unobligated LEU for tritium production through 2041.

QUESTION FROM SENATOR MARTIN HEINRICH

Domestic Uranium Enrichment

Q14. Administrator Gordon-Hagerty, based on the present projection, in approximately what year does NNSA currently expect it will need to reestablish a domestic uranium enrichment capability?

A14. NNSA's ongoing down-blending campaign will provide low-enriched uranium (LEU) for tritium production through 2041. NNSA is currently conducting an Analysis of Alternatives to examine all options for meeting the enriched uranium mission need. Any option pursued will need to be in place in time to provide LEU by 2041.

QUESTION FROM SENATOR MARTIN HEINRICH

Domestic Uranium Enrichment

Q15. Administrator Gordon-Hagerty, DOE/NNSA requires enriched uranium, but not necessarily unobligated enriched uranium, to fuel research and medical isotope reactors as part of its nonproliferation mission. Am I correct that Urenco USA's plant, the nation's only operating commercial uranium enrichment facility, is a possible near-term option to meet DOE's need for enriched uranium fuel, including HALEU, for these nonproliferation activities?

A15. NNSA's nonproliferation requirements for high-assay low enriched uranium (HALEU) have been incorporated into its ongoing Domestic Uranium Enrichment Analysis of Alternatives, which includes Urenco USA as a potential option.

QUESTION FROM SENATOR MARTIN HEINRICH

Albuquerque Complex Project

Q16. Administrator Gordon-Hagerty, last July NNSA broke ground on a new state-of-the-art office facility for its federal workforce in Albuquerque. I was pleased to join you at the event. The $175 million Albuquerque Complex Project will provide modern, safe and reliable workspace for the 1,200 employees who support the nation's vital national security mission. The building will also meet a Leadership in Energy and Environmental Design gold standard. What is the status of the project and the expected date NNSA staff will begin to occupy the new office building?

A16. Construction of the NNSA Albuquerque Complex Project is well underway and remains on schedule and on budget. The project continues to make progress toward meeting LEED objectives and is on track to achieve Gold level certification. NNSA staff are scheduled to begin occupying the building in 2021.

QUESTION FROM SENATOR MARTIN HEINRICH

Columbia Life of Core Fuel

Q19. Admiral Caldwell, what is the status of the life of core fuel you are producing for the Columbia class submarine and do you expect any issues when moving it into production for the fleet?

A19. Naval Reactors is supporting construction of the first COLUMBIA-Class submarine by developing a reactor plant with a life-of-ship core that will be in service for more than 40 years.

In support of this effort, the types of core materials that will be used in the COLUMBIA-Class reactor core were also used in the Technology Demonstration Core being delivered this summer to refuel the Naval Reactors' land-based prototype at our facility in New York. We have completed manufacturing of the alternate core material to refuel this prototype. This effort proved the ability to manufacture alternate core material on a production scale and identified means to improve manufacturability and performance of the COLUMBIA-Class core.

Earlier this year, Naval Reactors placed the reactor plant long-lead procurement contract with Navy funding (Shipbuilding and Conversion, Navy), including the reactor core, to support the shipyard's build plan. The contract was placed on time, following design efforts that began in 2010, and we expect to remain on schedule and on budget in support of COLUMBIA-Class construction beginning in FY 2021 with delivery in FY 2028.

QUESTION FROM SENATOR MARTIN HEINRICH

Low Enriched Uranium Fuel

Q20. Admiral Caldwell, some have advocated using Low Enriched Uranium fuel similar to the French for their submarines. What are the issues, here in open session, from a technical and cost perspective?

A20. The Naval Nuclear Propulsion Program has a history of using highly enriched uranium in naval cores. This technology has enabled the program to develop reactor cores that are capable of lasting the entire life of a submarine. The effect of this capability can be seen in the ability to replace 14 OHIO-Class submarines with 12 COLUMBIA-Class submarines by forgoing a mid-life reactor refueling. This results in substantial savings over the life of the class in terms of acquisition, maintenance, and operational costs.

Today, nearly 45 percent of the Navy's major combatants are nuclear powered, including 11 aircraft carriers and 69 submarines. The U.S Navy mission has a global reach with a high operating tempo and energy requirements. The French operate far fewer nuclear-powered ships. Their nuclear fleet is less than one-seventh the size of the U.S. nuclear-powered fleet. The French nuclear-powered ships are typically refueled every seven to ten years. Transitioning the U.S. Fleet to low-enriched uranium (LEU) fuel would result similarly in approximately two to three refuelings over the life of a ship, deviating from our current life-of-ship submarine core designs. Based on fleet size, the costs would be significantly greater for the U.S. Navy to maintain an LEU fleet.

Furthermore, an LEU fuel system would not provide any military benefit to the performance of U.S. naval reactors. LEU fuel would fundamentally decrease the

available energy in a naval reactor at a time that energy demands are expected to increase and would negatively affect reactor endurance, reactor size, ship costs, ship availability, force structure, and maintenance infrastructure.

QUESTION FROM SENATOR MARTIN HEINRICH

Idaho Spent Fuel Project

Q21. Admiral Caldwell, what is the cost and completion status of the spent fuel pond facility at the Idaho National Laboratory? Are there any issues you are worried about?

A21. The Spent Fuel Handling Recapitalization Project will design and construct a new facility, the Naval Spent Fuel Handling Facility, to incorporate the capabilities for naval spent nuclear fuel handling that currently exist in the Expended Core Facility (ECF) and its supporting facilities. Additionally, a major portion of this new facility is required to support additional capability, which does not exist in the ECF, to handle full-length aircraft carrier naval spent nuclear fuel received in M-290 shipping containers.

I approved the Performance Baseline and Start of Construction (Critical Decision-2/3) in September 2018. The project has an estimated total project cost of approximately $1.687 billion with completion in FY 2025, of which, $40 million was included to account for potential increases in market-based conditions, such as unanticipated increases in labor costs and domestic steel prices. Naval Reactors continues to closely monitor and evaluate the volatility in labor costs and material prices as well as other issues typical for a construction project of this size in Idaho (e.g., winter related impacts).

The project is completing site preparation, has begun the mass geotechnical excavation, and will begin permanent construction activities this fiscal year.

QUESTION FROM SENATOR MARTIN HEINRICH

Spent Fuel Examination Facility at the Idaho National Laboratory

Q22. Admiral Caldwell, my understanding is the spent fuel facility you are building at the Idaho National Laboratory will not have a capability to examine the fuel. What are you doing about this and how much might it cost?

A22. The capability to examine naval spent nuclear fuel from refueled or defueled warships is vital to Naval Reactors' mission of delivering reliable and effective nuclear propulsion plants. It enables resolution of emergent fleet issues, confirmation of continued safe and reliable operation in the fleet, design and manufacture of longer-life and higher-powered cores, and demonstration of performance of new fuel technologies. This capability is currently provided by the Expended Core Facility (ECF) located at the Naval Reactors Facility in Idaho. ECF is more than 60 years old and requires recapitalization.

Naval Reactors is taking a phased approach to recapitalizing the capabilities of the ECF that supports all Naval Reactors Program requirements, keeping recapitalization projects to a manageable scope and size, and considering affordability. The first step will be recapitalizing spent fuel handling operations to the new Naval Spent Fuel Handling Facility (NSFHF), which will be completed by the Spent Fuel Handling Recapitalization Project in FY 2025. Although some types of spent fuel examinations will be able to be accomplished in the NSFHF water pools, other types of spent fuel examinations must be performed in a dry environment (i.e., hot cells).

The Naval Examination Acquisition Project will recapitalize the spent fuel examination capabilities currently provided by the ECF hot cells. The project was initiated with

Critical Decision-0, *Mission Need Statement*, in January 2018, and is planned to begin preliminary design in FY 2023. The project is targeted to complete as early as the mid-2030s with a cost between $500 million and $1.3 billion.

QUESTION FROM SENATOR MARTIN HEINRICH

Electric Drive

Q23. Admiral Caldwell, my understanding is you are building an electric drive propulsion system for the Columbia class submarine and the contractor has had issues building it. What is the status of this project?

A23. In 2017, the vendor manufacturing the prototype Main Propulsion Motor for the electric drive system identified a manufacturing issue related to the procurement of improperly insulated material for the prototype motor stator. The vendor did not properly relay requirements to sub-tier vendors. This required remanufacturing a major portion of the prototype motor. The remanufactured prototype motor has since been delivered to the motor assembly facility where the vendor is completing final assembly and component testing. The vendor is under a firm fixed price contract and therefore is absorbing the costs associated with these actions.

In order to de-risk the lead ship motor assembly manufacturing process, the vendor built a full-scale mock-up motor at its motor assembly facility to prove out the final assembly process and special tooling. Additionally, we installed an alternate motor at the test facility and have started system level integration testing to ensure the prototype system (controllers and drives) perform and communicate as expected. By implementing these mitigation actions, we have been able to preserve the required nine-month margin for the required in-yard date for construction of the ship. As such, delivery of the production motor to the shipyard for construction of the lead ship will remain on schedule to support construction beginning in FY 2021.

QUESTION FROM SENATOR ELIZABETH WARREN

"Low-Yield" Nuclear Weapons

Q24. Administrator Gordon-Hagerty, my understanding is that the First Production Unit of the W76-2 was completed in February 2019, and that the NNSA is currently on a path toward completing the W76-2 Initial Operational Capability warhead quantity and delivering the units to the Navy by the end of Fiscal Year 2019. According to your written testimony for the May 8, 2019, Strategic Forces Subcommittee hearing, the W76-2 "provid[es] the U.S. an assured ability to respond in kind to a low-yield nuclear attack [and] discourages an adversary from pursuing such an attack and therefore strengthens deterrence." If funding for further work on the W76-2 were canceled in fiscal year 2020, would the United States have no other viable capabilities to deter a low-yield nuclear attack?

A24. Cancelling NNSA funding for the W76-2 in FY 2020 would not prevent NNSA from completing 100 percent of the production required for the W76-2 warheads, as all production is scheduled to complete in FY 2019. FY 2020 funding for the W76-2 is exclusively allocated to the administrative tasks associated with completing the program. The Department of Energy defers to the lead agency, the Department of Defense, on further details related to military capabilities and calculus.

QUESTION FROM SENATOR ELIZABETH WARREN

Saudi Civilian Nuclear Cooperation Agreement

Q25. Administrator Gordon-Hagerty, do you or any other NNSA official have current or prior involvement in Trump Administration efforts to negotiate a civilian nuclear cooperation agreement under Section 123 of the Atomic Energy Act of 1954? If yes, please explain the nature of that involvement.

A25. Yes, pursuant to section 123 of the Atomic Energy Act of 1954, as amended, the Department of Energy provides technical support to the Department of State in the negotiation of all peaceful nuclear cooperation agreements. The Office of Defense Nuclear Nonproliferation within NNSA provides this function for the Secretary of Energy. NNSA has provided such technical support to the negotiations since 2012, when the previous Administration commenced with such negotiations.

QUESTION FROM SENATOR JOE MANCHIN

Y-12 Facility Upgrades and Impact

Q28. Secretary Gordon-Hagerty, on April 6 of this year you gave testimony to the House Energy and Water Development Subcommittee that pieces of the roof were falling in at the old Lithium Processing facility locate at Y-12 to highlight the need for repairs and modernization. This followed a chemical spill on April 4 reported at the facility. Although both incidents are considered minor and did not affect the overall safety of the operations there, they raise concerns of the condition and long-term sustainability of operations under current conditions. As a part of your budget there are funds going to continuing projects to build new Uranium and Lithium processing facilities. Given the recent issues and your understanding of the state of facilities and operations at Y-12, are the current timelines for construction and upgrade of weapons going to meet the timeline goals of the Uranium Processing facility completion in 2025 and warhead upgrades by 2030?

A28. NNSA is committed to constructing the Uranium Processing Facility (UPF) for no more than $6.5 billion by the end of 2025. UPF has been on budget and on schedule for six consecutive years. The UPF nuclear facilities were baselined in March 2018 and construction is underway. UPF supports NNSA's enduring uranium mission and its commitment to modernize its infrastructure.

NNSA management practices ensure that we follow integrated schedules to align our strategic materials work with our warhead modernization activities. The W87-1 Modification Program, which has a scheduled First Production Unit date of FY 2030, remains on budget and on schedule. As part of NNSA's overall strategy, NNSA continues to maintain existing facilities until such a time when operations can move into the new facilities.

QUESTION FROM CHAIRMAN UPTON

NNSA RFI on High-Assay LEU

Q1. Please describe the current status of the NNSA's Request for Information DE-SOL-0008552 for Supply of Enriched Uranium and what NNSA's next steps are as it relates to information received under this solicitation.

A1. NNSA released its Request for Information (RFI) for Supply of Enriched Uranium in January of 2017. The RFI complies with DOE Order 413.3B and allowed NNSA to conduct market research on any commercial entities with an interest in meeting the Department's various enriched uranium needs (Low Enriched Uranium (LEU) for tritium production; High Assay LEU for research reactors, advanced commercial reactors, and medical isotope production; and Highly Enriched Uranium for naval propulsion).

NNSA received responses to the RFI in March 2017 and held an industry day in November 2017 to meet with interested parties. Information gathered through this RFI and at the subsequent Industry Day will inform an NNSA acquisition strategy in accordance with DOE Order 413.3B. The Department approved the mission need critical decision – 0 (CD-0) for a domestic uranium enrichment capability in December 2016, and is currently executing an Analysis of Alternatives (AoA). The AoA is estimated to be completed at the end of calendar year 2019, as stated in the Fiscal Year 2019 Stockpile Stewardship and Management Plan (SSMP), pages 2-33 to 2-34.

QUESTION FROM CHAIRMAN UPTON

Atomic Energy Act and International Nuclear Markets

Q2. The purpose of the Atomic Energy Act is to provide: "a program of international cooperation to promote the common defense and security and to make available to cooperating nations the benefits of peaceful applications of atomic energy as widely as expanding technology and considerations of the common defense and security will permit." However, the statute was enacted when the U.S. was one of only a small handful of countries that had access to atomic energy.

a. Would you agree that the purpose of the Atomic Energy Act to provide for international peaceful use of atomic energy remains important for the nation, even while the global nuclear landscape has changed?

b. Would you consider it beneficial for Congress to modernize the Atomic Energy Act to reflect the current reality, to ensure continued U.S. participation in the global nuclear power development and use?

A2. Pursuant to Section 1 of the Atomic Energy Act of 1954, as amended (AEA), it is the policy of the United States that the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security. Providing for international peaceful use of atomic energy, as called for in the AEA, remains important for the nation despite changes in the global nuclear landscape. If Congress proposes to amend the Atomic Energy Act, the Administration would review such legislation for consistency with the President's program.

QUESTION FROM CHAIRMAN UPTON

Nuclear Export Requirements

Q3. For US persons to directly or indirectly provide assistance for the production of special nuclear material pursuant to 10 CFR Part 810 it currently requires the Secretary of Energy's approval and the concurrence of the State Department. What other nuclear export control regulations require the Secretary or equivalent cabinet-level approval?

A3. 10 CFR Part 810 is the only U.S. nuclear export control regulation that uniformly requires approval by the Secretary or an equivalent cabinet-level official. The FY 2019 National Defense Authorization Act permits the Secretary to delegate approval of certain applications, and DOE is in the process of implementing this new legal direction.

QUESTION FROM CHAIRMAN UPTON

Secretarial Approval for 810 Authorization Requests

Q4. Is the Secretary's approval required for extension or minor-amendments such as the changing of an applicant's name of authorizations already in force? If so, how long does it typically take obtain the Secretary's approval for these minor amendments?

A4. When a specific authorization under 10 CFR Part 810 is issued, the approver signs a formal determination that describes the scope of the authorization and its duration. Extension of a specific authorization beyond its original duration requires further approval by DOE. Substantive changes to the scope of a specific authorization, such as transferring a new type of technology, also require further approval by DOE. However, non-substantive changes, such as changes in an applicant's name, do not require further approval by DOE.

Obtaining approval for renewals of and amendments to existing specific authorizations takes approximately the same amount of time as requesting a new authorization, because DOE must obtain the same government-to-government nonproliferation assurances and must complete the same interagency concurrences and consultations. Pursuant to the Administrative Procedure Act, U.S. companies that file timely requests for the renewal of existing specific authorizations are permitted to continue ongoing activities until a final decision is made on the renewal request.

QUESTION FROM CHAIRMAN UPTON

AEA Secretary Actions

Q5. Do all of the Department's civil nuclear regulatory obligations in the Atomic Energy Act require the Secretary of Energy's approval to allow normal transactions to take place?

A5. No, DOE has other statutory civil nuclear obligations under the Atomic Energy Act, as amended (AEA), that may be delegated to officials subordinate to the Secretary. For example, as authorized under Section 161n. of the AEA, the Secretary has delegated his authority under Section 131 of the AEA to enter into subsequent arrangements under an agreement for peaceful nuclear cooperation. These arrangements are used to convey U.S. consent for retransfers and other activities associated with U.S.-obligated nuclear material. Additionally, the FY 2019 NDAA authorizes the Secretary to delegate approval authority for certain Part 810 applications.

QUESTION FROM CHAIRWOMAN HARTZLER

Q1. General Klotz, what are the consequences to the U.S. government and taxpayers if we do not close the deal on the Bannister Road Complex in Kansas City soon? What if we do not get this $200 million appropriated here in FY2017?

A1. NNSA requires $200 million in FY 2017 to transfer ownership of the Kansas City Bannister Federal Complex – a high-risk, excess facility formerly home to the Kansas City Plant – to a private developer for demolition, remediation, and redevelopment. If the FY 2017 transfer window is missed, the private developer may walk away from the project, preventing NNSA from transferring the property. In the event the transfer is missed, NNSA will be required to carry the Bannister Federal Complex until disposition, which is estimated to cost between $8 million – $10 million per year. Additionally, NNSA may need to invest in improvements to keep the facility in stable condition until eventual disposition. The extent of these facility stabilization investments will vary significantly depending on the long-term disposition plan (e.g., disposition in several years versus 10 years or more). Additionally, the full extent of future funding requirements cannot be estimated due to unforeseeable emergent failures, such as a recent water main break in February 2017. Ultimately, if the Federal Government is required to complete the demolition and remediation, the cost is expected to be approximately $900 million.

QUESTION FROM CHAIRWOMAN HARTZLER

Q2. General Klotz, you've said several times to this committee and the public: "I can think of no greater threat to the nuclear security enterprise than the state of NNSA's infrastructure." This is a tremendously important statement and one that Congress and the American people need to internalize. Would you please elaborate on why you say this? And what you believe must be done?

A2. Infrastructure plays a vital, cross-cutting role in enabling NNSA's multiple national security missions, from ensuring the reliability of the U.S. nuclear deterrent to reducing the threat of nuclear proliferation and nuclear terrorism. Much of our infrastructure dates to the Eisenhower Administration, and in some cases the Manhattan Project era. Failure to revitalize this antiquated infrastructure presents significant risks to our ability to deliver missions effectively and efficiently, expand our capabilities and production capacity, and attract and retain new employees. Furthermore, without adequate investments, NNSA's infrastructure can pose safety risks to our workers, the public, and the environment. The breadth of these impacts informs my assessment that there is no greater risk to NNSA's missions than the current state of our infrastructure. Yet, although it has presented significant challenges, NNSA infrastructure has successfully enabled execution of the mission to date, and we are taking steps to address known challenges.

The establishment of the Office of Safety, Infrastructure, and Operations in January 2015 was the first action of many to improving the state of NNSA's infrastructure. This new organization enables NNSA to focus on identifying infrastructure gaps and risk, responding to emergent needs as they arise, and improving NNSA infrastructure over the long term. Within the Office of Safety, Infrastructure, and Operations, NNSA has two

programs that target investments to improve the condition of infrastructure and reduce programmatic and safety risk:

- Maintenance and Repair of Facilities; and
- Recapitalization: Infrastructure and Safety.

NNSA began requesting and receiving additional funding for maintenance and recapitalization activities starting in FY 2015. Sustained, predictable, and increased investments in these two programs along with strategic investments for new construction are needed to improve the condition of NNSA's infrastructure.

Additionally, the Office of Defense Programs also employs a smaller recapitalization program, Capability Based Investments (CBI), focusing on managing risks in existing capabilities by prioritizing investments to upgrade and improve the reliability, efficiency, and capability of programmatic equipment and associated infrastructure.

QUESTION FROM REPRESENTATIVE DESJARLAIS

Q7. Could you please provide a list of "single-point failures" within the NNSA enterprise. Facilities that, if they go down, we lose a critical capability that endangers the ability of the entire enterprise to sustain the stockpile.

A7. Over the last several decades, NNSA has taken action to eliminate unnecessary redundancies across the NNSA enterprise. As a result, most facilities under NNSA's purview are considered to be single points of failure. Additionally, most pieces of programmatic equipment and facility systems (such as fire suppression, heating and cooling, and dehumidification) housed in these facilities are also single points of failure.

QUESTION FROM REPRESENTATIVE ROGERS

Q1. Mr. McConnell, does NNSA have metrics or ways to measure the inefficiencies or costs that are being borne because of the existence of very old buildings and a very large backlog of deferred maintenance? What are those costs, as a rough order of magnitude estimate?

A1. NNSA is investigating new measures to give greater insight into the costs and inefficiencies caused by the declining state of infrastructure. A clear indicator of costs borne from old and declining facilities is the annual carrying cost of excess facilities. NNSA spends approximately $50 million annually for excess facility maintenance, surveillance, and stabilization to keep the facilities in safe and stable condition until eventual disposition.

QUESTION FROM CHAIRMAN ROGERS

Q2. Mr. McConnell, would a FIRP-like program, with special authorities to quickly pursue key projects, provide added value to NNSA's infrastructure recapitalization efforts? What special authorities could be included in such a temporary program?

A2. During the last several years, NNSA restructured our budget to provide clarity and focus on infrastructure investments consistent with what was achieved under the Facilities and Infrastructure Recapitalization Program (FIRP). The two FIRP-like programs that address deferred maintenance today are:

- Maintenance and Repair of Facilities; and
- Recapitalization: Infrastructure and Safety.

Sustained, predictable, and increased investments in these two programs, rather than the creation of a separate program, are needed to improve the condition of NNSA's infrastructure and reduce deferred maintenance.

The Administration will consider changes to existing authorities that could help NNSA implement infrastructure improvements faster and more efficiently to eliminate deferred maintenance and arrest the decline of infrastructure. We look forward to engaging Congress when and if specific legislative changes are sought by the Administration.

QUESTION FROM REPRESENTATIVE DESJARLAIS

Q3. Could you please provide a list of “single-point failures” within the NNSA enterprise. Facilities that, if they go down, we lose a critical capability that endangers the ability of the entire enterprise to sustain the stockpile.

A3. Over the last several decades, NNSA has taken action to eliminate unnecessary redundancies across the NNSA enterprise. As a result, most facilities under NNSA’s purview are considered to be single points of failure. Additionally, most pieces of programmatic equipment and facility systems (such as fire suppression, heating and cooling, and dehumidification) housed in these facilities are also single points of failure.

QUESTION FROM CHAIRMAN FISCHER

Deferred Maintenance and Excess Facilities

Q1. With an increased emphasis and funding for deferred maintenance and disposition of excess facilities on NNSA sites, by what process will NNSA determine which projects are performed through existing Management & Operations contracts, and which projects will be transferred to the Office of Environmental Management?

A1. Deferred maintenance reduction is paid for by the DOE Program (e.g., NNSA) that owns the facility. Record of facility ownership is documented in the DOE Facility Information Management System (FIMS). Similarly, the disposition of non-process contaminated facilities is funded by the DOE Program that owns the facility.

However, the deactivation and decommissioning of process contaminated facilities is the responsibility of DOE's Office of Environmental Management (EM). Therefore, the determination of which excess facilities are addressed by the DOE/EM is based on whether or not the facility is process contaminated. This distinction of responsibilities for the disposition of process-contaminated facilities was reinforced in the reports accompanying Fiscal Year (FY) 2006 Energy and Water Development appropriations bills, which provided direction that environmental cleanup activities remain with DOE/EM. Additional information on this process can be found in the December 2016 report to Congress on the Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities. NNSA must have agreement and acceptance from EM before any process contaminated buildings can be transferred.

The DOE/EM request includes $225 million for a targeted effort to accelerate deactivation and decommissioning (D&D) of specific high-risk facilities at the Y-12 National Security Complex and the Lawrence Livermore National Laboratory not currently in the EM programs' inventory to achieve substantial risk reduction within four years. This effort supports modernization of the nuclear security enterprise. Below is a list of the NNSA Y-12 and Lawrence Livermore facilities that are part of this effort in rough priority order by site.

Y-12 National Security Complex

- Alpha-4 Building 9201-4 COLEX Process Equipment
- Beta-4 Classified Tool Storage Facility Building 9720-24
- Critical Experiment Facility Building 9213

Lawrence Livermore National Laboratory

- Pool Type Reactor Building 280
- MARS E-Beam Facility Building 175
- Heavy Elements Facility Building 251

QUESTION FROM SENATOR DONNELLY

Implementation of Augustine Meis Recommendations

Q2. Administrator Klotz – the National Academies of Science and Public Administration are reviewing the recommendations from the various governance studies that have taken place over the last four years to ensure not only are they implemented but they make a difference. Can you explain how you are ensuring these recommendation are not only implemented but revisiting them to make sure they are having the effect they were intended?

A2. NNSA is working closely with the joint Implementation Assessment Panel from the National Academies of Sciences (NAS) and National Academy of Public Administration (NAPA) to track the progress and effectiveness of the steps it has taken to follow the recommendations made in the various governance studies. NNSA has adopted the DOE Office of Science model to develop more rigorous and dependable Contractor Assurance Systems (CAS) to improve its governance and oversight of field operations at its laboratories, sites, and plants. As a part of this new approach, NNSA will conduct its first site peer review in July.

As recommended by NAS and NAPA in their 2017 report, *Tracking and Assessing Governance and Management Reform,* NNSA has defined an effective mission-focused operating model as the vision for implementing the changes. NNSA is currently working with its management and operating contractors to develop meaningful metrics to identify, measure, and track the effectiveness of those changes.

QUESTION FROM SENATOR DONNELLY

Replacement of the Spent Fuel Handling Facility at the Idaho National Laboratory

Q3. ADM Caldwell, what is the status of the replacement for the spent fuel handling facility at the Idaho National Laboratory? When do you expect it to be operational? How much will it cost?

A3. With the funding provided by Congress in fiscal year (FY) 2017, the Spent Fuel Handling Recapitalization Project is finalizing major facility design requirements and the facility's design. Additionally, in FY 2017, Naval Reactors has commenced long lead material procurements for the Project and will begin site preparation activities at the Naval Reactors Facility on the Idaho National Laboratory. The first phase of construction will start as early as the fourth quarter of FY 2018, pending approval of critical decision 3 and the results of the geotechnical engineering investigation of the basalt. This is consistent with the Project's schedule and will deliver the fully executed capability in FY 2025 at a total project cost of $1.65 billion.

QUESTION FROM SENATOR DONNELLY

Round 4

Q9. Administrator Klotz, the microelectronics facility at Sandia is due for replacement over the next ten years. It produces unique chips for nuclear weapons in radiation environments that are not duplicated anywhere else. What actions are you taking to start this process and what options are you looking at?

A9. Currently we are conducting the Trusted Microsystems Capability (TMC) Analysis of Alternatives (AoA), which is scheduled to be completed in fiscal year (FY) 2017. This AoA evaluates the cost and effectiveness of different options for fabricating trusted radiation-hardened microelectronics for NNSA needs. In FY 2018, we will complete the conceptual design, preliminary hazard analysis, and integrated safety management plan as required for the selected alternative. NNSA will ensure sufficient overlap between the Sandia National Laboratories facility closure and implementation of the chosen alternative to guarantee that future production needs are met.

QUESTION FROM SENATOR DONNELLY

Round 4

Q10. ADM Caldwell, you are refueling the S8G reactor at the Knolls Atomic Power Laboratory with Ohio replacement fuel. What is the status of the refueling operation? How much will it cost and when will it be completed?

A10. The S8G Prototype Refueling Overhaul is set to begin execution in fiscal year (FY) 2018. This availability will refuel the reactor core, and complete needed maintenance and modernization of components and systems to support the next, approximately, 20 years of operation. Currently, Naval Reactors (NR) is completing construction of the Radiological Work and Storage Building, which will provide the radiological work and laydown space for the industrial subcontractor, and shipping refueling equipment from the shipyards to the Kesselring Site in upstate New York. The lead maintenance activity for the overhaul, Newport News Shipbuilding, has begun planning the work and identifying approximately 300 tradesmen required for execution. In parallel, NR is manufacturing the Technology Demonstration Core (TDC), which will use the alternate core materials necessary to support the life-of-ship reactor core for the COLUMBIA-Class submarine. Manufacturing and inserting the TDC core into the S8G Prototype will reduce the manufacturing risk for the COLUMBIA-Class and provide operational data that will inform the operating parameters for the COLUMBIA-Class ships. The refueling overhaul will be complete in FY 2020 and the prototype will be available for research and development efforts as well as student training in FY 2021. The total cost of the availability is $1.57 billion.

QUESTION FROM SENATOR DONNELLY

Additional Questions

Q13. Administrator Klotz, what is the status of the cruise missile W80-4 life extension program and are there any issues we should be concerned with?

A13. The W80-4 life extension program is on-track and progressing as expected. The program is currently in the Feasibility Study and Design Options Phase (6.2) of nuclear weapons refurbishment activities (defined as the Phase 6.X acquisition process), formally authorized by the Nuclear Weapons Council in July 2015. We anticipate Phase 6.2 will conclude in FY 2017, with immediate entry into the Design Definition and Cost Study Phase (6.2A) as planned in FY 2018.

A focus area for NNSA is to ensure alignment with the Air Force's development activities and schedules for the Long Range Standoff (LRSO) cruise missile as they execute their respective Design Development efforts. After the Air Force awards the LRSO contracts for Technical Maturation and Risk Reduction (TMRR), scheduled for later this year, NNSA will begin a joint process to align program schedules through a series of Technical Interchange Meetings with the Air Force Program Office and the two missile contractors. The goal of this effort will be to align NNSA design development efforts in Development Engineering, Phase 6.3, with the contractor missile design during the Department of Defense's TMRR phase such that the program has gained sufficient confidence through joint testing to commence Production Engineering, Phase 6.4.

QUESTION FROM SENATOR DONNELLY

Additional Questions

Q14. Administrator Klotz, what is the status of the W88 life extension program and the replacement of the high explosives?

A14. The W88 Alteration (Alt) 370 remains on schedule, with a first production unit (FPU) scheduled for December 2019. The program accelerated activities for the Conventional High Explosive (CHE) refresh to align with the original Alt 370 scope. Full alignment was achieved when the program received authorization to transition into Phase 6.4 Production Engineering in February 2017. This authorization came after the completion of the Development-Engineering Phase, the combined System Baseline Design Review (March 2016), the Department of Defense design review (September 2016), and the System Pre-production Engineering Gate (January 2017). The CHE refresh scope will not delay the W88 Alt 370 FPU.

QUESTION FROM SENATOR DONNELLY

The nuclear security enterprise

Q15. Gen. Klotz: NNSA's SSMPs from FY2014 through FY2017 have shown sharp increases beyond the agency's out-year budget estimates (its Future-Year National Security Program budget or FYNSP). For example, the W80-4 program's low-range cost estimate for fiscal year 2017 exceeds the budget estimate by about $26.9 million. Budget estimates for some modernization programs for fiscal years 2018 through 2021 are more than $5 billion below the funding levels NNSA has identified needing. If funding needs are not met, will NNSA have to defer some modernization work? How would this affect the agency's overall modernization schedule? What actions is NNSA taking to mitigate the impact of schedule delays?

A15. NNSA's Future Years Nuclear Security Program annual programming process allocates available resources based on funding priorities while maintaining a careful balance between near-term and long-term needs of the stockpile and the nuclear security enterprise supporting the stockpile. Should resource constraints prevent appropriation of the Administration's full funding request, NNSA will analyze the short and long-term needs and assume risk in programs where possible, using techniques and strategies to mitigate these risks. While this could involve deferring planned modernization activities or shifts to planned program schedules, these decisions are carefully coordinated to ensure national security needs continue to be met. One example of actions to mitigate impacts include the conduct of detailed Analysis of Alternatives in order to explore the feasibility of alternative investment strategies that can meet enterprise needs while conserving valuable resources.

QUESTION FROM SENATOR DONNELLY

The nuclear security enterprise

Q16. Gen. Klotz: Over the last several years, NNSA has appointed strategic material managers to oversee the capabilities to continue to produce such materials. Many studies of the nuclear security enterprise have found that overlapping and poorly defined functions and authorities have fostered inefficient procedures and cultures within DOE and NNSA. What impact have the strategic material managers NNSA appointed to oversee sustainment of the capabilities needed for these materials had on the sustainment efforts? NNSA had planned to appoint a lithium manager; has one been appointed?

A16. NNSA established strategic material managers in 2014 to integrate, oversee, plan, and execute material strategies. Each strategic material manager is the executive accountable to the NNSA Administrator for ensuring the mission-related capabilities and capacities are available to customers. The strategic material managers provide written biweekly reports and quarterly briefings directly to the Administrator and other senior leaders. NNSA clearly defines the roles and responsibilities for these managers and establishes their authorities in the new NNSA Business Operating Procedure (BOP) 06.07, issued in January 2017. The strategic material managers have been successful in developing and managing their overall mission strategy, mission requirements, and technology development activities.

Strategic material managers have been designated for uranium, plutonium, tritium, and domestic uranium enrichment capabilities. NNSA is determining how best to establish additional strategic material managers for lithium and possibly other materials.

QUESTION FROM SENATOR DONNELLY

The nuclear security enterprise

Q17. Gen. Klotz, in 2014, NNSA established the Office of Cost Estimating and Program Evaluation (CEPE) to provide the Administrator with independent data driven analysis. CEPE can best support NNSA program and project management when cost data is shared freely throughout the nuclear security enterprise and with the related offices within the Defense Department. However, there have been instances of program offices refusing to share data with properly cleared counterparts in other program offices. What is your position on data sharing among program offices? How can NNSA move toward greater data sharing to help program offices better analyze information and negotiate contracts?

A17. NNSA uses and shares data across the nuclear security enterprise (NSE) as a critical element to continue to improve program management and performance for Planning, Programming, the Budgeting and Evaluation process, Independent Cost Estimates, Analysis of Alternatives, and various analyses to support mission needs.

NNSA, as part of a disciplined and integrated processes, continues to institutionalize program and project management. Data driven program and project management analyses and decisions are critical to NNSA's efforts to further improve quality management and performance.

NNSA is also continuing efforts to work with the management and operating (M&O) contractors to improve and integrate cost and indirect structures with program and project management tools. NNSA has made progress on data visibility and consistency in the development of a common financial reporting system to improve and integrate financial management and cost visibility across the NSE. These collaborative efforts between

NNSA and its M&Os build on the foundation of data sharing for defined requirements in accomplishing mission and mission support work.

There are two examples of NNSA's Office of Cost Estimating and Program Evaluation's use of programmatic data for analysis include the following Reports to Congress.

1. Report to Congress, "Cost Estimating and Program Evaluation Activities and Major Atomic Energy Defense Acquisition Program Status," (May 1, 2015).

2. Report to Congress, "Cost Estimating and Program Evaluation Fiscal Year 2015," (November 14, 2016).

QUESTION FROM SENATOR DONNELLY

Nuclear nonproliferation

Q18. Gen. Klotz, in September 2015, GAO reported that GTRI (now part of M3) spent $5 million in reactor conversion activities worldwide, out of the $559.5 million in funding from fiscal years 2009 through 2013 to support international conversion activities. Progress on such activities has stalled since 2013. How has M3 used funding appropriated for conversion activities since 2005?

A18. M3 has used all the $559.5 million appropriated for conversion activities between fiscal years (FY) 2009 and 2013 to convert domestic and international research reactors and isotope production processes from Highly Enriched Uranium (HEU) to Low Enriched Uranium (LEU) fuel and targets, and to accelerate the establishment of a domestic, commercial supply of the critical medical radioisotope molybdenum-99. The $5 million figure cited by the Government Accountability Office (GAO) refers only to funds that were appropriated and costed between FY 2009 and 2013 on foreign research reactors that were converted. Due to the long timeframes (5-10 years) in reactor conversion projects, most of the funds to support the 25 conversions during FY 2009 and 2013 were appropriated prior to 2009 and, therefore, not reported to the GAO. Since FY 2013, NNSA's Office of Material Management and Minimization has converted or verified the shutdown of 15 HEU research reactors and isotope production facilities, with much of the funding coming from appropriations received during the FY 2009 to FY 2013 that were also not reflected in the GAO report.

QUESTION FROM SENATOR DONNELLY

Nuclear nonproliferation

Q19. Gen. Klotz, what is NNSA's strategy for engaging "hard case" countries with vulnerable or poorly secured nuclear materials, and what is the evidence or what are the prospects that these efforts are having or may result in significant nuclear security improvements in those countries?

A19. Where possible, NNSA engages bilaterally with countries with vulnerable nuclear materials to discuss best practices and provide technical guidance on securing these materials. For countries where bilateral interactions are not possible, NNSA works through multilateral organizations, such as the International Atomic Energy Agency (IAEA) to encourage these "hard cases" to meet their obligations to secure their material in accordance with IAEA recommendations which have increased standards in recent years. Over the past two decades working with its international partners, NNSA has eliminated more than 6,200 kilograms of nuclear material, including all highly enriched uranium from 31 countries and Taiwan; provided upgrades to 221 buildings with weapons-usable nuclear material in the Former Soviet Union; equipped more than 600 sites around the world with radiation detection systems to combat nuclear and radiological terrorism, and; recapitalized the IAEA's ability to safeguard nuclear material around the world. Because of the importance of securing nuclear materials, NNSA will remain flexible and adjust its approach to ensure that nuclear materials that could be used for a nuclear weapon do not fall into the hands of terrorists.

QUESTION FROM SENATOR DONNELLY

Whistleblower protections

Q20. In 2016, GAO reported on DOE's insufficient whistleblower protections. DOE has taken limited or no action to hold contactors accountable for creating a chilled work environment. DOE officials provided GAO with examples where: (1) little or nothing was done in response to intimidation of contractor employees who report safety and other concerns; (2) a subcontractor was terminated after reporting safety concerns; and (3) a contractor employee was terminated allegedly because she cooperated with GAO. What actions has DOE taken to improve whistleblower protections and hold contractors accountable for intimidating and retaliating against whistleblowers?

A20. The Department is strongly committed to a workplace where all workers are free to raise concerns without fear of retaliation. In particular, contractors are statutorily and contractually bound not to retaliate against employees for protected whistleblower conduct. DOE takes concerns of retaliation very seriously. To further the commitment to whistleblower protection, the Department recently issued a final rule, which became effective in March 2017, clarifying that the Department may issue civil penalties against certain contractors and subcontractors for instances of whistleblower retaliation that concern nuclear safety. Among other things, the Department requires its contractors to inform contractor employees of their right to file a formal complaint pursuant to applicable regulations. The Department has also:

- Increased the awareness of a healthy safety culture, to include training more than 2,000 Federal and contractor managers in leadership for a safety conscious work environment.
- Promptly investigates claims of retaliation as well as the allegations that may have prompted the complaint of retaliation;

- Communicates/reinforces expectations of establishing and maintaining a positive safety culture and Safety Conscious Work Environment (SCWE), and the need to foster an environment of trust, a questioning attitude and receptiveness to raising issues.
- Periodically evaluates using standard industry survey instruments the organizational climate at its sites.

A number of venues and processes have been established for contractor and subcontractor employees to raise concerns or escalate issues if they perceive a lack of concern or action from their own management or by DOE responsible officials. Furthermore, several mechanisms exist for contractor and subcontractor employees to pursue claims that they have been retaliated against for raising concerns before, depending on the circumstances, the Department, the Department's Office of the Inspector General, or the Department of Labor.

QUESTION FROM SENATOR HEINRICH

Microlab Pilot Program

Q26. Section 3120 of the NDAA for FY16 established a microlab pilot program to help stimulate open collaboration for universities and businesses with the NNSA labs and the commercialization of lab-developed technologies. Sandia National Laboratories has proposed a new Center for Collaboration and Commercialization (C3), with Phase I to be located in downtown Albuquerque. Is NNSA supportive of the C3 and what is the current status and timeline for the project?

A26. NNSA is supportive of this effort. Phase I of the Preliminary Real Estate Plan (PREP) for the Center for Collaboration and Commercialization Node in downtown Albuquerque was approved by DOE/NNSA, through the Sandia Field Office, on June 5, 2017. A Request for Quotations will be submitted with the intention of moving into a leased space (of approximately 1000 square feet) by the end of the year. The plan for Phase II, pending approval and Congressional funding, is to lease approximately 20,000 square feet near the Sandia Science and Technology Park sometime between fiscal year 2018 and 2019.

QUESTION FROM SENATOR HEINRICH

LDRD

Q27. Section 3119 of the FY17 NDAA established a pilot program to eliminate overhead costs on spending for Laboratory Directed Research and Development at the NNSA labs. Will the pilot program be implemented at the start of FY18 as required?

A27. Yes, the NNSA laboratories will implement the pilot program to remove general and administrative (G&A) costs from the Laboratory Directed Research and Development (LDRD) program at the start of fiscal year 2018. NNSA continues to meet with NNSA laboratory Chief Financial Officers to discuss pilot program implementation prior to issuing annual forward pricing guidance in June 2017, along with working with respective LDRD leads through the NNSA LDRD Working Group.

QUESTION FROM SENATOR HEINRICH

Albuquerque Complex on Kirtland Air Force Base

Q28. I appreciate your joining me last year to tour the 1950s-era office buildings housing about 1,100 federal employees at the Albuquerque Complex on Kirtland Air Force Base. The building doesn't meet basic safety requirements and will be replaced with a new facility on Eubank Boulevard designed to LEED Gold standard. I'm pleased to see the budget request for the project is $98 million for FY18. What is the current status of the project and when do you expect construction to begin?

A28. NNSA is committed to transforming the Cold War nuclear weapons complex into a 21st-century enterprise. One key component of NNSA's enterprise is the Albuquerque Complex, which has become too old, too costly, and is in an entirely unsatisfactory state for NNSA's highly skilled workforce.

The Albuquerque Complex Project will replace the existing complex with a single new building that meets sustainable building requirements. The modern facility will house the workforce who support a broad range of NNSA programmatic capabilities necessary for both current and future NNSA missions. This new building will provide modern, safe, and reliable infrastructure that improves the safety and working environment for approximately 1,200 site employees. The project will be executed via a firm-fixed-price contract with USACE. It will be structured as two sub-projects: one for construction of the new facility and one for D&D of the old Albuquerque Complex.

In August 2015, NNSA completed an Analysis of Alternatives (AoA), and the Alternative Selection and Cost range (CD-1) was approved in February 2016. The DOE Office of Project Management and Oversight Assessment performed an

Independent Cost Estimate (ICE) in September FY 2016 resulting in a total project cost (TPC) range of $199 million to $247 million. The project reached 60% design maturity in May 2017 and is currently on track to request combined approval of the Performance Baseline and Start of Construction (CD-2/3) in the second quarter of fiscal year (FY) 2018. Construction is projected to be completed in the first quarter of FY 2022.

QUESTION FROM SENATOR WARREN

Sustaining Nuclear Security Infrastructure within Russia

Q29. Since the 1990s, the United States has spent billions of dollars to build nuclear infrastructure on Russian territory - for things like training centers, sensors, nuclear safeguards, and other technology. Now that Russia is unwilling to cooperate on many bilateral proliferation activities, how is NNSA verifying that Russia is maintaining this infrastructure? Does NNSA have a strategy to ensure that this investment is not wasted?

A29. NNSA's security upgrades and assistance to secure Russia's nuclear infrastructure were provided under the Cooperative Threat Reduction umbrella agreement which allowed assurance visits for three years after the completion of the upgrades. The assurance period for a great deal of the assistance expired even before the Russian decision to discontinue the joint work. However, NNSA's cooperation with Russia always included a strong sustainability component that focused on ensuring that the Russians had the technical capability and financial resources to maintain the upgraded nuclear security infrastructure. Despite this effort, NNSA remains concerned over the long-term sustainability of NNSA's investments. Now that NNSA no longer has direct access to Russian facilities to verify the status of NNSA-provided upgrades, NNSA is attempting to remain engaged with Russian counterparts wherever possible through mutually-beneficial and cost-shared technical exchanges at bilateral and multilateral fora.

QUESTION FROM CHAIRMAN ROGERS

Q1a. General Klotz, would you please describe to us why Secretary Moniz tasked the three NNSA laboratory directors to carry out the study titled "U.S. Nuclear Deterrence in the Coming Decades"?

A1a. Secretary Moniz tasked this study as part of the Department's mission to ensure an effective U.S. nuclear deterrent through the application of science, technology and engineering. The Department of Energy (DOE) strives to ensure U.S. nuclear capabilities meet the challenges of known and future geopolitical and technology trends.

Q1b. What did it examine and why?

A1b. The 2014 tri-laboratory study 1) examined known and projected future characteristics of global nuclear stability; 2) provided perspective on the evolution of U.S. strategic deterrence; 3) assessed current policy and programs; 4) examined potential future geopolitical and technological trends and scenarios that test the robustness of U.S. capabilities; and 5) outlined preliminary recommendations and areas meriting further study. The study examined these topics to challenge U.S. thinking about DOE programs of record and inform future decisions to reduce the risk of technological or geopolitical surprise.

Q1c. What were some of its high-level conclusions?

A1c. The three national laboratories agreed that the United States needed to take action to ensure that U.S. nuclear capabilities can meet the challenges of emerging geopolitical and technological trends. A key recommendation was to conduct and periodically update a

comprehensive assessment of the current and emerging threats to the effectiveness of the U.S. nuclear deterrent, including the review of options to address identified gaps.

QUESTION FROM CHAIRMAN ROGERS

Q2a. Please tell us about the Joint Strategic Deterrence Review (JSDR) process that was created in December 2016? Why was it created and what does it do?

A2a. The Joint Strategic Deterrence Review (JSDR) was a recommendation that came out of the deterrence study that was tasked to the national laboratory directors. The Deputy Secretaries of Energy and Defense signed a memorandum of agreement on JSDR to strengthen Department of Defense, Department of Energy and the Intelligence Community cooperation in analyzing potential threats to the United States' ability to maintain strategic deterrence as well as potential options for mitigating those threats.

Q2b. How does the Trump Administration view the JSDR process?

A2b. Each new Administration since the mid-1990s has conducted a Nuclear Posture Review. This Administration has followed suit and has directed an NPR to be conducted to ensure the U.S. nuclear deterrent is modern, robust, flexible, resilient, ready, and appropriately tailored to deter 21st-century threats and reassure our allies. NNSA will contribute to DoD's review, which will account for a broad range of views.

Q2c. How is it incorporating this type of process into the Nuclear Posture Review (NPR)?

A2c. All NPR deliberations are under executive privilege and not releasable. The NPR will be in full accord with the President's direction given in the National Security Presidential Memorandum on Rebuilding the U.S. Armed Forces from January 27, 2017.

QUESTION FROM CHAIRMAN ROGERS

Q3. The bad idea fairy seems to visiting some folks in this town and proposing that we should defer spending on the LRSO and GBSD programs until the Nuclear Posture Review is complete. Does the Administration support this idea?

A3. The Fiscal Year 2018 President's Budget Request for NNSA supports the program of record for W80-4 Life Extension Program, which is intended for integration into the Air Force's Long Range Stand-off (LRSO) cruise missile, as determined by the Nuclear Weapons Council. Both the LRSO and the Ground-Based Strategic Deterrent (GBSD) are Air Force programs of record.

QUESTION FROM CHAIRMAN ROGERS

Q4. Looking at the Trump Administration's FY18 budget request for DOD nuclear forces and NNSA's nuclear weapons activities, is there more consistency between the Obama Administration's plans, or more difference? Does the FY18 budget request in these areas deviate from the Obama Administration's plans in any very substantial way?

A4. The Fiscal Year (FY) 2018 President’s Budget Request continues the program of record detailed in the FY 2017 Stockpile Stewardship and Management Plan. NNSA's Weapons Activities budget includes planned increases to the program of record as well as increases to adapt to emerging changes, such as updates to the baseline costs for the B61-12 Life Extension Program and the W88 Alteration 370.

QUESTION FROM REPRESENTATIVE FRANKS

Q30. Looking at the Trump Administration's FY18 budget request for DOD nuclear forces and NNSA's nuclear weapons activities, is there more consistency between the Obama Administration's plans, or more difference?

A30. The Fiscal Year (FY) 2018 President’s Budget Request continues the program of record detailed in the FY 2017 Stockpile Stewardship and Management Plan. NNSA's Weapons Activities budget includes planned increases to the program of record as well as increases to adapt to emerging changes, such as updates to the baseline costs for the B61-12 Life Extension Program and the W88 Alteration 370.

QUESTION FROM REPRESENTATIVE FRANKS

Q31a. CBO has recently estimated the cost of sustaining, operating, and modernizing our nuclear deterrent to be $400 billion over the next 10 years-including both DOD and NNSA costs. Do you agree with this estimate?

A31a. NNSA publishes future year cost estimates in our annual Stockpile Stewardship Management Plan (SSMP), but NNSA has not estimated costs for the Department of Defense portion of the $400 billion estimate and therefore has no basis by which to judge its accuracy. The DOE portion of Congressional Budget Office's (CBO) $400 billion estimate was $134 billion. Our own current estimate for that period (2017-2026), as detailed in the SSMP, is ~$112-120 billion.

Q31b. CBO estimates this $400 billion represents roughly 6 percent of the total defense budget during this time. Do you believe this is an appropriate amount to be spending on the nuclear deterrence?

A31b. Since the end of the Cold War, investments in the strategic deterrent have fallen to under 4 percent of the defense budget, but historically has been much higher than 6 percent during periods of recapitalization, particularly prior to the end of the Cold War. Over the past 40 years, Weapons Activities funding has ranged from 1.0 to 1.7 percent of total Defense discretionary spending. At currently planned levels, Weapons Activities spending over the next 10 years would constitute about 1.6 percent of defense spending.

The National Nuclear Security Administration's missions include maintaining the safety, security, reliability, and effectiveness of the nuclear weapons stockpile; reducing the threat of nuclear proliferation and nuclear terrorism around the world; and providing nuclear

propulsion for the U.S. Navy's fleet of aircraft carriers and submarines. NNSA's budget is vital to ensuring that U.S. nuclear forces are modern, robust, flexible, resilient, ready, and appropriately tailored to deter 21st-century threats and reassure America's allies. NNSA's budget represents a prudent investment in a key component of our overall defense strategy. Significant and sustained investment is needed to replace aging infrastructure, provide for warhead life extension programs, revitalize our production capabilities, continue to advance the science which guarantees the safety, reliability and effectiveness of the stockpile, and sustain our highly talented workforce. Failure to make the right investments could significantly impact the deterrent.

QUESTION FROM REPRESENTATIVE GARAMENDI

Q39a. Why do we need the IW-1 rather than a life-extended W78?

A39a. The Nuclear Weapons Council's (NWC's) August 2016 Strategic Plan reaffirmed the need for the interoperable warhead 1 (IW1) as the first ballistic missile in the 3+2 Nuclear Stockpile Strategy. The 3+2 Strategy is a long-term strategy with emphasis on reduced warhead types, interoperability to enable smaller inactive stockpile, and reduced burden on production infrastructure. The IW1 objective is to deploy an interoperable nuclear explosive package for use in the Mk21 intercontinental ballistic missile aeroshell and the Mk5 submarine-launched ballistic missile aeroshell with adaptable non-nuclear components.

IW1 will accomplish the following: 1) replaces capability currently provided by the aging W78; 2) rebalances sea-leg deployment to reduce risk against technical failure; and 3) along with IW2, enables replacement of capability provided by the W88. A W78 life extension program may not provide the capability envisioned for IW1 or meet the long-term requirements of the 3+2 Strategy. The pending NPR may shed greater light on this issue.

Q39b. What steps is NNSA taking to ensure that any changes to the warhead, including any modifications to the nuclear components, do not affect the reliability of the warhead?

A39b. Warhead reliability is one of many requirements established by the Department of Defense in what are called Military Characteristics (MCs). The IW1 MCs will be generated by the DoD and approved by the Nuclear Weapons Council (NWC), but they are not officially established yet. As with all ongoing nuclear warhead life extensions programs and major modifications,

NNSA performs extensive testing and analytical assessments to meet reliability requirements prior to deployment of the warhead. With over 70 years of experience, the NNSA (through its Design and Production Agencies) has established proven processes to meet reliability and other objectives for both newly manufactured and reused components and expects to do so for IW1.

QUESTION FROM REPRESENTATIVE GARAMENDI

Q40a. Trump Administration has decided to terminate the MOX project, noting that "major cost overruns and schedule slippages have led to a re-examination of how best to achieve [our nonproliferation commitments]" and "It would be irresponsible to pursue this approach when a more cost-effective alternative exists."

Why did this administration decide to terminate the MOX Project?

A40a. Independent cost reviews and estimates directed by Congress have all concluded that the MOX program of record is significantly more expensive and would take more time than originally planned. The new Administration reviewed all independent reports and met with all parties including MOX Services, the current contractor, and their parent companies to fully understand the costs, challenges, and risks associated with constructing the MOX project or pursuing the dilute and dispose approach. After careful review, the Administration came to the same conclusion as the last Administration—that the current MOX program of record is unaffordable and the dilute and dispose approach meets the nonproliferation requirements much faster with significantly lower cost and risk.

Q40b. Have any new reviews taken place under the new administration?

A40b. Most of the information reviewed by the new Administration and key decision makers were from prior studies, including the recent U.S. Army Corps of Engineers report on the Mixed Oxide Fuel Fabrication Facility contract structure and the Government Accountability Office's Plutonium Disposition report to the Senate Armed Services Subcommittee on Strategic Forces.

QUESTION FROM REPRESENTATIVE GARAMENDI

Q41. To what extent are Weapons Activities infrastructure investments driven by the 50-80 pits per year production requirement and to what extent is the 50-80 pits per year production requirement driven by the IW-1?

A41. NNSA's Plutonium Strategy includes a number of investments intended to sustain the capabilities necessary to support stockpile requirements. These include a combination of line-item projects and resource investments that help reduce mission dependency on aging facilities, modernize our infrastructure, and help NNSA meet statutory pit production requirements, including achieving a 50-80 war reserve (WR) pits per year (ppy) production capacity in the 2030s. Much of this investment would be required, regardless of the pit production requirement.

The January 16, 2014, Assessment of Nuclear Weapon Pit Production Requirements Report to Congress confirmed the need for achieving 50-80 ppy production capacity by 2030, citing multiple drivers. Key among these drivers are both the need to support future stockpile planning requirements and address stockpile needs due to pit aging. The requirement to achieve a 50-80 ppy production capacity was codified by Congress most recently in the 2016 National Defense Authorization Act (Sec. 3140). Although the current build plan of Interoperable Warhead 1 (IW1) is the main driver for the current pit production requirements, any replacement life extension program for the W78 warhead could require similar, if not higher, production requirements.

QUESTION FROM SENATOR PATTY MURRAY

Q1. The Pacific Northwest National Laboratory in my home state of Washington is a leader in nonproliferation work for the National Nuclear Security Administration. In your written testimony you highlight the important work conducted with international partners to secure and account for nuclear material, and improve the ability of our partners to detect, interdict, and investigate illicit trafficking of these materials. This international cooperation has been a cornerstone of the Defense Nuclear Nonproliferation's (DNN) Global Material Security program, and it is critical that it continues.

Administrator Klotz, do you agree that international cooperation with partner nations is an important component of DNN's work?

A1. Close coordination with partner nations is a key component of the National Nuclear Security Administration's (NNSA) leadership of global efforts to combat proliferation. These efforts require a layered architecture of safeguards, export controls, verification, and security. One of the most effective ways to ensure our national security is to permanently eliminate the materials that could be used by terrorists or would-be proliferators in a potential improvised nuclear device or radiological dirty bomb, or secure and safeguard those materials until such time that they can be eliminated.

To achieve this, we work closely with partner countries to implement a defense-in-depth approach to material security. This means eliminating material when possible, implementing security improvements as close as possible to "target" material, where security measures are most effective, and creating multiple layers of security and detection to mitigate weaknesses in any single layer. In coordination with our interagency partners, such as the Department of State and Federal Bureau of Investigation, we provide partner nations with technical assistance to enhance security, safeguards, and material and technology interdiction capabilities, and make a focused effort to increase their capacity to sustain these activities.

It is critical to U.S. national security that our partners have capabilities to prevent, counter, and respond to nuclear and radiological threats. For this reason, we continue to work with our partners to build their capabilities to secure and safeguard nuclear and radiological materials from theft or diversion; counter and interdict the illicit trafficking of nuclear and radiological materials; control the illicit transfer of nuclear and dual-use materials, technology, and expertise; and implement robust verification and monitoring protocols.

Q2. The Consolidated Appropriations Act of 2017 included a provision that shifted the research and development work for the U.S. High Performance Research Reactors program from the Material Management and Minimization (M3) program to the DNN research and development program.

Administrator Klotz, what has been the result of separating the research and development portion of the U.S. High Performance Research Reactors program? Have there been any additional costs associated with this shift? Can you describe any similarities or differences in the type of research conducted under the DNN research and development program and the U.S. High Performance Research Reactors program?

A2. As a matter of clarification, the Consolidated Appropriations Act of 2017 required that all of the funding for the U.S. High Performance Research Reactor (USHPRR) program be allocated under the DNN R&D program, not only those portions related to R&D. DOE/NNSA considers less than five percent of the USHPRR program to be R&D activities.

Shifting the USHPRR program to DNN R&D resulted in approximately $100K- $200K of increased costs associated with reallocating funds and additional accounting and reporting requirements for the National Laboratories executing work as part of the USHPRR program. These additional expenses to the taxpayer add no efficiencies with the execution of the work on the USHPRR program.

The scope of work under the USHPRR program is primarily associated with mid to high Technology Readiness Levels (TRL) technologies and focuses on commercial scale demonstration and optimization. Much of the research conducted by DNN R&D is associated with basic science and low TRL technologies. Often, once the research conducted by DNN R&D moves to the mid to high TRL stage, a technology transfer to industry will occur and DNN's role will diminish. DNN R&D projects are also generally much smaller and shorter term efforts lasting two to three years, while the USHPRR program will be executed over the next decade.

Q3. The Fiscal Year 2018 Budget Request shifts $53 million for the U.S. High Performance Research Reactors program research and development from the DNN research and development program back to the M3 program.

Administrator Klotz, can you explain why this proposed change from the Consolidated Appropriations Act of 2017 was made? Are there any milestones or requirements that exist for the research and development conducted under the U.S. High Performance Research Reactors program?

A3. The Fiscal Year 2018 Budget Request is consistent with prior year allocations for the U.S. High Performance Research Reactor (USHPRR) program and the Fiscal Year 2017 Budget Request for M3. M3 manages both international and domestic reactor conversion work and while these efforts have unique aspects, there are many similarities that make the management of the two scopes of work more efficient if all funding is managed by the same program office.

DOE/NNSA considers R&D activities to constitute less than five percent of the USHPRR program's work scope. The USHPRR program is working to qualify the low enriched uranium (LEU) fuel design and demonstrate a commercial-scale process for fabricating the LEU fuel. The USHPRR program established strategic and progress milestones (to date, 32 milestones are complete and 63 milestones remain). The program includes management tools and oversight processes to track the

5,500 individual work activities that feed into the program milestones. The limited R&D activities in the USHPRR program are already included in these milestones and activities.

QUESTION FROM SENATOR JEANNE SHAHEEN

Q1. In 2014, Russia suspended its cooperation with the National Nuclear Security Administration (NNSA) to secure their stockpiles of nuclear materials. As a result, efforts to construct surveillance systems and radiation detectors at Russian ports, airports and border crossings to catch potential nuclear smugglers have been jeopardized. What actions are you taking to detect any nuclear material that may have been stolen from Russia and potentially being sold on the black market?

A1. NNSA has active partnerships with the majority of countries neighboring Russia, including all fifteen countries of the Former Soviet Union, as well as Mongolia and China, to develop their capabilities to detect the illicit trafficking of nuclear and radiological materials. This work includes equipping international checkpoints, such as border crossings, airports, and seaports with radiation detection systems; and providing technical tools that can be used to scan areas between official borders and within a country's interior. NNSA also focuses heavily on training partners on the proper use and long-term maintenance, sustainability, and operations of these systems.

Q2. Are you working with Russia's neighboring countries to assist in the detection of potentially stolen nuclear material?

A2. NNSA has active partnerships with the majority of countries neighboring Russia, including all fifteen countries of the former Soviet Union, as well as Mongolia and China to develop their radiation detection capability along high-threat radiological and nuclear smuggling pathways. NNSA works with border security organizations to equip priority border crossings, including sea- and airports, with radiation detection systems. These systems are integrated into checkpoint operations to provide automated, continuous scanning of people, vehicles, and cargo. Unlike traditional security tools such as metal detectors, X-ray scanners, and trained canines, which cannot detect radiation; radiation detection systems are necessary tools to prevent smuggling of radiological and nuclear material.

NNSA also provides mobile detection systems (MDS) to add security at other locations. MDS are routinely used near boundaries where equipment installations are impractical or not authorized and along maritime and rugged green borders. Working with multiple partners increases the probability of deterring and detecting smuggling of radiological/nuclear materials.

Q3. As you indicated in your testimony, the NNSA's counter terrorism and counter proliferation program are part of a broader U.S. government effort to assess the threat of nuclear terrorism and develop technical countermeasures. How does the NNSA use its expertise to work with other federal agencies to detect and identify nuclear threats?

A3. NNSA's Offices of Counterterrorism and Counterproliferation and Defense Nuclear Nonproliferation work closely with Federal partners to reduce risk associated with nuclear and radiological incidents by:

- Providing specialized nuclear device-related threat information and analysis to the Intelligence Community (Central Intelligence Agency, Defense Intelligence Agency, National Counterterrorism Center, and DOE Office of Intelligence & Counterintelligence) and key Department of Defense combatant commands (e.g., USSOCOM, USCENTCOM, and USPACOM) to identify potential and emerging threats and support contingency planning;

- Assessing non-traditional nuclear security vulnerabilities associated with nuclear materials or weapons to support nuclear security policy development efforts with the Nuclear Regulatory Commission;

- Supporting detection strategies implemented by the Department of Homeland Security, and jointly responding to nuclear and radiological incidents and accidents with the Departments of Defense and the Department of Justice;
- Combatting the threat of nuclear terrorism through participation in the Global Initiative to Combat Nuclear Terrorism, co-chaired by the United States and the Russian Federation;
- Conducting capability assessments of our interagency partners' existing tools (i.e., detection, risk assessment, and render safe), and developing new tools to enhance joint technical countermeasures and response capabilities; and
- Advancing USG capabilities through research and development activities with the Departments of Homeland Security and Defense.

Additional detail on these activities can be provided in a classified briefing.

Q4. Does the NNSA work with foreign countries to develop similar capabilities in order to detect nuclear threats?

A4. NNSA actively engages with our international partners to address the broad spectrum of nuclear and radiological security. In particular, NNSA's Office of Counterterrorism and Counterproliferation (CTCP) actively engages foreign countries to advance U.S. nuclear counterterrorism and counterproliferation objectives. CTCP has long-standing international relationships with the United Kingdom and France focusing on nuclear threat reduction. CTCP also works with other advanced civil nuclear fuel cycle countries and countries with an elevated risk of nuclear terrorism or nuclear emergency response needs. Such cooperation includes:

- Training courses on radiological/nuclear incident response and consequence management;
- Technical advice and reach-back on incident response;
- Joint technical experiments;
- Tabletop and field exercises on response and consequence management for radiological/nuclear incidents, accidents, and threats.

NNSA's Office of Global Material Security (GMS) works with foreign counterparts to develop their capability to prevent, detect and interdict smuggling of nuclear and radiological material that could be used in an improvised nuclear device (IND) or radiological dispersal device (RDD) event, and to strengthen these partners' abilities to forensically analyze interdicted material. NNSA conducts this work in coordination with the Department of State to ensure a whole of government approach is taken when improving the capabilities of foreign partners' capabilities. GMS has provided radiation detection systems, and associated training and technical support to more than 60 countries. GMS also has a number of prioritization tools and engagement strategies to enhance nuclear and radiological security at sites in more than 100 countries worldwide.

Additional detail on these activities can be provided in a follow-on briefing.

Q5. The NNSA has many facilities that date back to the Manhattan project and are in need of being torn down and replaced, especially for safety and security reasons. This is a big concern because, as you know, NNSA facilities are responsible for the safety and reliability of many components of US nuclear weapons systems. This year, Congress appropriated more than $2.8 billion to NNSA's Infrastructure and Operations program to address this issue, and the President is requesting a similar amount in the FY2018 budget. Could you please describe NNSA's current effort and future initiatives to address the deteriorating infrastructure and backlog of deferred maintenance at NNSA facilities?

A5. 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 for nearly a decade. NNSA's FY 2017 enacted budget, which includes significant additional support from Congress, should actually begin to decrease NNSA's deferred maintenance.

To revitalize NNSA's infrastructure and control deferred maintenance, NNSA is:

- Deploying new decision-making tools for more effective use of resources;
- Expanding the use of Asset Management Programs, which achieve economies of scale and maintenance standardization for critical building systems common across the enterprise (e.g. roofs, HVAC);
- Disposing of unneeded facilities; and
- Implementing improved project management systems and all appropriate acquisition options to ensure cost effective delivery of new construction.

Since FY 2015 NNSA has requested higher percentage of funding for recapitalization and maintenance projects. These funding increases are essential to decreasing deferred maintenance, arresting the declining state of infrastructure, increasing productivity, improving safety, eliminating costly compensatory measures, and shrinking the NNSA footprint through the

disposition of unneeded facilities. Maintenance investments are focused on limiting the growth of deferred maintenance; while recapitalization focuses on replacing or refurbishing outdated and inadequate facilities. NNSA prioritizes our recapitalization projects based on standardized criteria that assess each project's relative importance to achieving mission results, improving safety, and reducing deferred maintenance.

Also, the DOE Office of Environmental Management (EM) request includes $225 million for a targeted effort to accelerate deactivation and decommissioning (D&D) of specific high-risk facilities at the Y-12 National Security Complex and the Lawrence Livermore National Laboratory not currently in the EM programs' inventory to achieve substantial risk reduction within four years. This effort supports modernization of the nuclear security enterprise. Below is a list of the NNSA Y-12 and Lawrence Livermore facilities that are part of this effort in rough priority order by site.

Y-12 National Security Complex

- Alpha-4 Building 9201-4 COLEX Process Equipment
- Beta-4 Classified Tool Storage Facility Building 9720-24
- Critical Experiment Facility Building 9213

Lawrence Livermore National Laboratory

- Pool Type Reactor Building 280
- MARS E-Beam Facility Building 175
- Heavy Elements Facility Building 251

MORE QUESTIONS FROM SENATOR SHAHEEN

Q1. In your written testimony you highlight several priorities including the design of a new propulsion plant and the refueling of a research and training reactor for the new COLUMBIA class submarine program. Can you discuss the importance of these projects as you prepare to build this new class of submarine?

A1. Naval Reactors is responsible for the design of the propulsion plant for the COLUMBIA-Class submarine including: the design of the life-of-ship core and reactor plant, design of the steam and electric plant portions of the propulsion plant including the integrated power system (electric drive), integration of the propulsion plant into the overall submarine, and ensuring the design and manufacturability of the propulsion plant components. This propulsion plant will not require refueling, allowing the Navy to meet U.S. STRATCOM's operational requirements with a SSBN force of 12 vice the 14 OHIO-Class SSBNs currently required, at a savings of ~$40B over the life of the ship. In addition to our continuing nuclear fleet support role, this effort is of the highest priority within Naval Reactors.

Over the next several years, we will be completing the final designs and conducting manufacturing qualification of the major reactor plant components. We will also be completing the prototype manufacture and beginning system level integration testing of the prototype electric drive components. Advance Procurement of propulsion plant Government Furnished Equipment begins in FY 2019 to support ship construction start in FY21 and ship delivery in FY 2028.

The S8G Prototype Refueling Overhaul is also important to our overall development effort of the COLUMBIA-Class' life-of-ship reactor core – a reactor core that will last the 42-year life of the ship.

As part of the S8G Prototype refueling effort, NR is manufacturing the Technology Demonstration Core (TDC), which will use the alternate core materials necessary to support the life-of-ship reactor core for the COLUMBIA-Class submarine and manufacture and installing the TDC core. The S8G Prototype will reduce the reactor core manufacturing risk for the COLUMBIA-Class and provide operational data that will inform performance predictions for the COLUMBIA-Class ships. The refueling overhaul will complete in FY 2021 and the prototype will be available for research and development efforts as well as student training for another 20 years.

My staff is focused daily on ensuring Naval Reactors successfully delivers these projects on time and within budget to make the COLUMBIA-Class submarine a successful strategic deterrent platform, that the first ship is mission ready on its first strategic deterrent patrol in 2031, and that the last ship of the class lasts through the 2080's. With the expertise contained within the Naval Nuclear Propulsion Program combined with your continued support, these challenges are manageable and currently support the construction of the lead ship starting in FY 2021.

Q2. Are there any additional resources you need or does the budget request ensure that Naval reactors can safely oversee our nuclear-powered Navy fleet?

A2. Naval Reactor's mission is to provide militarily effective nuclear propulsion plants and ensure their safe, reliable, and long-lived operation. In FY 2018, this entails effective oversight of the operation and maintenance of 101 reactors in 75 submarines, 11 aircraft carriers, and 4 training and research reactors. Full support of Naval Reactors' budget request for FY 2018 will ensure that this mission can be met.

QUESTIONS FROM SENATOR TOM UDALL

Q1. In the March 29, 2016 Record of Decision (ROD) on Surplus Plutonium Disposition, NNSA determined that 6 metric tons (MT) "will be placed in the queue of waste to be shipped to WIPP." 81 FR 19588.

- What is the current schedule for preparing that 6 MT and disposing it in WIPP?
- What is the current Total Estimated Cost for preparing the 6 MT?
- What is the current Total Estimated Cost for disposing the 6 MT at WIPP?

A1. The Savannah River Site (SRS) will complete the down blending of the 6 metric tons (MT) of non-pit surplus plutonium in 2046. In September 2016, SRS resumed down blending operations and the Department of Energy has completed several shipments of down blended plutonium to the Waste Isolation Pilot Plant (WIPP) since the repository reopened in January 2017. The total estimated cost to down blend the 6 MT of plutonium from 2018 thru 2046 is approximately $750 million. The cost to dispose of this material at WIPP is currently estimated at approximately $9 million to $22 million above WIPP base costs, depending on shipping schedules. Costs of WIPP base operations, transportation and disposal are part of DOE's Office of Environmental Management funding, not NNSA's funding.

Q2. What are the specific forms and volumes of surplus plutonium that are included in the dilute and disposal program for which conceptual design activities and an independent validated lifecycle estimate are included in the Fiscal Year 2018 Budget Request? (Vol. 1, page 500).

A2. The Dilute and Dispose Program is intended to disposition 34 MT of plutonium. The material is currently in various forms of oxides, metals and pits from dismantled nuclear weapons.

Q3. What are the specific forms and volumes of surplus plutonium that are not included in the dilute and disposal program? What are the disposition proposals for such surplus plutonium?

A3. The excess plutonium not part of the dilute and dispose program as referenced in the Surplus Plutonium Disposition Supplemental Environmental Impact Statement (EIS) includes approximately: 7 metric tons (MT) in a spent fuel form to be disposed in a geologic repository; 4 MT in Zero Power Pulse Reactor (ZPPR) fuel for which the Department is evaluating disposal options; 6 MT not originally designated for MOX and to be disposed of at the Waste Isolation Pilot Plant, and 7.1 MT of plutonium in pits that does not have an assigned disposition path.

Q4a. You agreed to share with us a written justification of your comments that all plutonium in South Carolina can be disposed of in WIPP under current law.

In addition, does that include the 34 metric tons of plutonium that would be headed for South Carolina, including from foreign nations? If so, what is the justification for that as well?

A4a.

DOE is working with the State of New Mexico to address Waste Isolation Pilot Plant (WIPP) capacity issues, regardless of any decisions on the 34 metric tons (MT) of surplus plutonium. The current tracking method, which uses outer container volume, counts a significant amount of air between the inner and outer containers as waste. A proposed permit modification, which does not require changes to current law, identifying a more accurate tracking of actual waste volumes was submitted to the New Mexico Environment Department (NMED) on January 31, 2018. On June 1, 2018, NMED notified DOE that the request would be processed as a Class 3 modification, which involves more extensive procedures and public participation. On June 27, 2018, NMED requested additional information. We'll continue to work with the State on the process moving forward.

The Department believes it is appropriate to adopt a more accurate method of tracking waste volumes to allow WIPP to fulfill its mission for all DOE sites. Continuing to use the outer container to calculate the volume of record could impact WIPP's ability to accept future transuranic (TRU) waste streams from continuing missions and clean-up activities across the DOE complex. DOE believes there is sufficient capacity at WIPP for all waste identified in the current inventory, given that future and potential waste streams have an inherent uncertainty and final waste volumes can differ significantly from the initially projected volumes. However, we expect that the projected inventory will continue to grow, e.g., due to identification of new transuranic waste streams and maturing of decommissioning and demolition planning. This more accurate calculation methodology will also accommodate 34 MT within the WIPP Land Withdrawal Act capacity limit. To meet the statutory capacity under either the existing or proposed new accounting method, WIPP will need to excavate disposal panels whether or not additional surplus plutonium is designated for disposal. It is important to note that not all of the 34 MT of surplus plutonium is currently in the State of South Carolina.

Plutonium returned from foreign nations is part of DOE's ongoing campaign concerning over 6 MT of other surplus plutonium, which DOE is down-blending and disposing of at WIPP pursuant to prior interim actions and DOE's Record of Decision for the Surplus Plutonium Disposition Supplemental Environmental Impact Statement, DOE/EIS-0283-S2 (April 2015).

Q4b. Please include a list of any changes in permits and approvals that would be required and an explanation of all other waste streams that the DOE is considering sending to the WIPP. As you know WIPP has both volume and radioactivity limits in statute. To that end, can you explain the plan DOE has in place for storing existing and foreseen TRU waste in WIPP?

A4b. The Department of Energy (DOE) updates its estimates of transuranic (TRU) waste destined for disposal at the Waste Isolation Pilot Plant (WIPP) each year in its Annual Transuranic Waste Inventory. The inventory includes existing TRU waste in storage at DOE sites and TRU waste projected to be generated by ongoing and known future clean-up activities, and includes the 6 MT of surplus plutonium at the Savannah River Site. The known existing and projected waste – "anticipated waste" – provides the basis for WIPP planning and regulatory compliance. As part of the inventory updates, DOE also gathers information on "potential" WIPP waste: waste streams for which programmatic decisions have not been made, inadequate information exists to determine its eligibility, or restrictions against its acceptance for disposal at WIPP. WIPP operational planning is not based on such waste streams, given the high uncertainties regarding the decisions as well as the potential volumes. Potential waste streams are identified in the 2016 Annual TRU Waste Inventory Report, Table 4-1 and Appendix B (http://www.wipp.energy.gov/library/TRUwaste/DOE-TRU-16-3425_Rev_0_ATWIR-2016.pdf). The list of potential waste streams is evaluated and updated annually in the TRU waste inventory report.

The 34 metric tons (MT) of surplus plutonium has not yet been designated for disposal at WIPP and is not included in the anticipated inventory. NNSA is currently in the process of evaluating the life cycle needs to dilute-and-dispose of that material. DOE's Office of Environmental Management is working closely with NNSA to define associated implications

for WIPP disposal of the 34 MT. As part of that process, we will be working to identify all necessary measures to accommodate that volume and type of waste, operational considerations, and safety and security needs.

QUESTION FROM SENATOR KIRSTEN GILLIBRAND

Inertial Confinement Fusion (ICF) Program

Q1. Secretary Gordon-Hagerty, the ICF program supports critical experimental platforms that complement and validate computer modeling to maintain the nation's nuclear stockpile without underground nuclear weapons testing. We have worked very hard to ensure a stable program that allows the Department, its national laboratories, and its university and industry partners to plan and execute the experimental work necessary to ensure the safety and reliability of our nuclear stockpile. However, the Administration's Fiscal Year 2019 budget request would cut experiments at the National Ignition Facility, propose the shutdown of the OMEGA Laser Facility at the University of Rochester in New York, and terminate all university programs. The work of hundreds of scientists and researchers would end and efforts to achieve ignition, which would have tremendous benefits for the nation's nuclear stockpile stewardship, would be considerably slowed if not abandoned. This FY19 budget request will lead to the loss of U.S. leadership in these critical national security areas. Please provide an explanation for these proposed program cuts and explain how these proposals will not weaken the stockpile stewardship program.

A1. The proposed budget for Fiscal Year (FY) 2019 redirects resources to the most immediate stockpile stewardship needs, reflecting difficult choices that balance priorities between meeting near-term and long-term needs for the nuclear stockpile. The Inertial Confinement Fusion Ignition and High Yield (ICF) Program will continue to provide essential data and supporting expertise required for the ongoing assessment and certification of the nuclear weapon stockpile at the proposed $419 million funding level for FY 2019. This level of funding not only preserves the core of the most critical experimental capabilities supported through the ICF program, ensuring that there will be no impact to experiments supporting ongoing life extension programs, but also advances experimental platform development for weapon outputs and effects studies. In the long-term, achieving laboratory ignition remains a goal for the Stockpile Stewardship Program, as does the reconstitution of the academic alliances and university partnerships

in a way that complements NNSA’s Research & Development (Science) and Advanced Simulation & Computing Programs.

QUESTION FROM SENATOR KIRSTEN GILLIBRAND

Inertial Confinement Fusion (ICF) Program

Q2. Secretary Gordon-Hagerty, I was pleased to hear during your Senate confirmation hearing that recruiting and maintaining the "best and the brightest" is a priority for you and NNSA. The OMEGA Laser Facility at the University of Rochester's (UR) Laboratory for Laser Energetics (LLE) is one of the three leading facilities for NNSA's Inertial Confinement Fusion program. As the DOE's and NNSA's largest university-based research center, the LLE is the only major facility that trains graduate students and also supports over 400 users from 55 universities and over 35 centers and national laboratories. More than 330 UR students alone have completed their Ph.D. degrees with LLE's support and 100 students are currently conducting research there. Given that LLE clearly serves as a vital pipeline to educate and train future talent, a priority you have identified for NNSA, I was disappointed to see the budget request would propose a 50% cut to the LLE in FY19 and shut it down completely in three years. How do you reconcile your testimony and prioritization of talent with the President's request? How can we ensure that LLE continues to train the future workforce to help meet our national security needs?

A2. The role that LLE has played in educating and developing a trained workforce in the high energy density (HED) area is valued, and NNSA has recommended continued support for a University of Rochester-based research center focusing specifically on fundamental HED science and education, continuing their rich history of workforce development for the weapons program.

The proposed budget for Fiscal Year 2019 reflects difficult choices that balanced priorities between meeting near-term and long-term needs for the nuclear stockpile including workforce development and training. The ability to recruit and retain the best and brightest is a priority for NNSA, and we will continue to strive to meet this challenge across all of the scientific, engineering, and manufacturing disciplines required to meet our mission.

QUESTION FROM SENATOR DONNELLY

Naval Reactors Decommissioning and Cleanup

Q6. ADM Caldwell, I understand you are working with DOE Environmental Management (EM) to have them perform some cleanup operations. To what extent will DOE Environmental Management perform this mission and on what facilities – will it extend to the current fuel pond at Idaho when the new one is built?

A6. Naval Reactors (NR) has pursued a collaboration effort with DOE-EM to capitalize on their expertise and processes to increase our rate in reducing environmental liabilities. Naval Reactors and DOE-EM are currently developing the strategic framework necessary to lay out a prioritized plan across the Future Years Nuclear Security Plan, identify the project management processes to control funding transfers and project execution, and establish appropriate memorandums of agreement to define the nature of the partnership.

The plan and budget profile for NR D&D activities over the next 5 years is required to meet current mission needs and is based on using our current NR D&D processes and subcontractor (Babcock & Wilcox Shaw Remediation [BWSR]). Naval Reactors' contract with BWSR extends through FY19 with an option year in FY20. BWSR will continue to perform D&D activities under the scope of this contract.

In FY 2019, Naval Reactors and DOE-EM will accomplish the necessary planning and scoping activities to enable a transition to utilize DOE-EM to perform D&D work. Our goal is to be in a position to execute initial pilot projects in FY 2020 and expand to other projects in future budget years. The specific pilot projects have not yet been determined.

Under this new arrangement, DOE-EM would perform large-scale D&D projects, and Naval Reactors would continue to perform unique, smaller-scale efforts (such as high-curie work within an active building) using in-house personnel or via subcontract based on the nature of the work and the most efficient use of resources.

Naval Reactors would oversee the work and establish program management checkpoints where DOE-EM must obtain approval to proceed, to be specified in a Memorandum of Agreement under development. Naval Reactors and DOE-EM would utilize the principles of DOE Order 413.3B to define and control this program of work. The work would be performed by DOE-EM contractors to DOE-EM requirements, under a DOE-EM managed contract. Naval Reactors would provide annual transfers to DOE-EM based on the approved scope.

The earliest that D&D work could commence on the Expended Core Facility at the Naval Reactors Facility in Idaho is estimated to be in the 2040s. Therefore, determination of DOE-EM involvement in the D&D of this facility will be made at a later date.

QUESTION FROM SENATOR DONNELLY

Naval Reactors Decommissioning and Cleanup

Q7. ADM Caldwell, at one point I understand you were looking at commercial sites to dispose of the decommissioned reactor vessels. What is the status of that effort?

A7. Naval Reactors is preparing to conduct an Environmental Impact Statement (EIS) for CVN 65 (the first decommissioned nuclear aircraft carrier) to assess: 1) commercial recycling of the non-nuclear portions of the ship followed by reactor compartment packaging at Puget Sound Naval Shipyard (PSNS); and 2) commercial dismantlement and disposal of the reactor plants and recycling of the remainder of the ship. The EIS process will allow us to obtain input from stakeholders including the public on options for disposal. The EIS process is expected to start in the Fall of 2018 and span approximately three years.

In 2012, the Navy issued an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for disposal of the CVN 65 reactor plants at PSNS, where submarine and cruiser reactor plant disposal has traditionally been done. The eight reactor compartments would be removed from the ship as it is dismantled and individually sealed in high-integrity packages for transport to the Department of Energy's Hanford site.

However, as the technical details to actually perform the work outlined in the 2012 EA and FONSI developed, PSNS estimates for the overall cost as well as the time in drydock grew to where there was substantial doubt that the plan outlined in the EA and FONSI could be executed without additional cost and impact on active ship work. This cost and

schedule growth, in part, led to a reexamination of additional alternatives. One such alternative is packaging the eight individual reactor compartments from CVN 65 as four pairs, which reduces the shipyard's efforts relative to the work outlined in the 2012 EA/FONSI. However, the larger and heavier reactor compartment disposal packages could require modification to the transportation route from Bremerton, Washington to the Hanford site.

Separately, within the last decade, the cost to commercially recycle non-nuclear Navy ships declined to almost zero, and the idea of partial commercial dismantlement was developed. The number of large commercial nuclear power plants being dismantled in the commercial industry also increased. Given that both the commercial nuclear dismantlement industry as well as the commercial shipbreaking industry offered the potential for substantially reduced cost with proven results, without impacting Navy facilities, it seemed prudent for the Navy to evaluate this alternative.

At this time, Naval Reactors does not have a preferred choice for CVN 65 disposal. The objective is to recommend an approach that is executable, environmentally responsible, and effective in the utilization of Navy resources.

QUESTION FROM SENATOR DONNELLY

Savannah River Site

Q8. Administrator Gordon-Hagerty, you are looking at using the existing MOX building and its 400,000 square feet of un-finished space to machine plutonium, yet your own analysis says you need only about 100,000 square feet of that space. What are you going to do with the rest of it since this facility was custom built for making MOX fuel with 3 foot thick walls?

A8. While no mission other than pit production has been identified for the MOX facility, it is a viable asset that can be repurposed for other high hazard missions in addition to its use as a pit production facility.

QUESTION FROM SENATOR JOE DONNELLY

Low-Yield SLBM Warhead

Q12. Administrator Gordon-Hagerty, is there a budget proposal yet for the low yield SLBM warhead and how much will it cost for FY19?

A12. As submitted in the amended Fiscal Year (FY) 2019 budget request, $65 million is requested in FY 2019 for the low yield submarine-launched ballistic missile, which is now referred to as the W76-2 warhead.

QUESTION FROM SENATOR HEINRICH

Visit to New Mexico's national laboratories

Q13. Under Secretary Gordon-Hagerty, congratulations on your confirmation as administrator; I look forward to working with you in support of the department's national security programs. I recognize you have taken on a very challenging job and already have a lot on your plate. However, I urge you to visit the NNSA's national laboratories soon to learn firsthand about their important work and the outstanding scientists and engineers that help maintain the nation's nuclear stockpile. Will you make plans to come to New Mexico in the near future to visit both Los Alamos and Sandia National Laboratories?

A13. Thank you for your support, and I look forward to working with you during my tenure. Since being sworn in, I have made it a priority to visit all of the laboratories, plants, and sites that comprise the National Nuclear Security Administration's (NNSA) nuclear security enterprise. I visited the Los Alamos National Laboratory in April 2018 and Sandia National Laboratories in June 2018 as well as the Lawrence Livermore National Laboratory in Livermore, California in May 2018. From ensuring the nuclear stockpile is safe, secure, and effective; to developing nuclear nonproliferation tools; and providing counter-proliferation expertise – the work done at these laboratories is central to NNSA's national security missions.

QUESTION FROM SENATOR MARTIN HEINRICH

Plutonium Strategy

Q14. Under Secretary Gordon-Hagerty, at your confirmation hearing last month you indicated the plutonium strategy would be a top priority. Your testimony made reference to the pending deadline Congress set in section 3141(d) of this year's NDAA for a final decision. This process has taken far longer that it should have. An AoA was completed in October 2017, but failed to consider the modular approach at LANL or produce a practical recommendation. Then, an engineering analysis was undertaken in December to inform the selection of an alternative and to support conceptual design of a preferred alternative. The engineering analysis has not been completed.

Did the engineering analysis fully evaluate the modular approach at Los Alamos National Laboratory (LANL)?

A14. Yes. The engineering assessment includes an evaluation of the technical and functional feasibility of four different options for additional high-hazard, high-security footprint for the production of 50 war reserve pits per year. Three of these options are at Los Alamos National Laboratory (LANL) and one is at Savannah River Site. One of the three options evaluated at LANL is their proposed "modular approach." NNSA also conducted a workforce and staffing analysis to assess the common staffing requirements and enable valid comparisons between the preferred alternatives. The analysis of alternatives, engineering assessment, and workforce analysis will be used to further refine budget requests and inform a conceptual design to support Critical Decision-1 in Fiscal Year 2020.

QUESTION FROM SENATOR MARTIN HEINRICH

Plutonium Strategy

Q15. Under Secretary Gordon-Hagerty, can you assure me that key stakeholders, including the subject matter experts at LANL, will review the engineering analysis and that your decision will be based on the best data available and sound cost estimates?

A15. The engineering assessment (EA) and workforce analysis do not recommend an alternative, but are intended to provide additional information to senior NNSA decision-makers. Subject matter experts (SMEs) from Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and the Savannah River Site (SRS) were an integral part of the EA, and an SME from each site provided their plutonium expertise and input to the EA throughout the document's development. In addition, NNSA provided a review period for additional subject matter experts from LANL, LLNL, and SRS to review the EA for factual accuracy. The EA provides additional analysis related to cost, schedule, risk, and feasibility for four options at the two alternative locations identified by the analysis of alternatives.

QUESTION FROM SENATOR HEINRICH

Plutonium Strategy

Q16. Under Secretary Gordon-Hagerty, will NNSA's Office of Cost Estimating and Program Evaluation (CEPE) fully review and report to you and the congressional defense committees on the engineering analysis?

A16. The National Nuclear Security Administration's (NNSA) Office of Cost Estimating and Program Evaluation was part of the review process of the engineering analysis and part of the NNSA team that briefed the congressional defense committees.

QUESTION FROM SENATOR HEINRICH

Plutonium Strategy

Q17. Under Secretary Gordon-Hagerty, are you aware that the Los Alamos County Council recently passed a resolution strongly supporting LANL's role as the nation's center of excellence for plutonium R&D and expansion of the lab's pit production capabilities?

A17. Yes, I am aware of the Los Alamos County Council's resolution. The National Nuclear Security Administration (NNSA) greatly appreciates the vital role our partners in Los Alamos play in our national security missions. NNSA is committed to an enduring plutonium mission at Los Alamos. The Los Alamos National Laboratory is and will remain the center of excellence for plutonium R&D.

QUESTION FROM SENATOR HEINRICH

Plutonium Strategy

Q18. Under Secretary Gordon-Hagerty, working with the Nuclear Weapons Council, will you be able to propose a path forward by the 150-day deadline as directed in section 3141(d) of the FY18 NDAA?

A18. Per section 3141(d) of the National Defense Authorization Act for Fiscal Year 2018, I endorsed a path forward on May 10, 2018.

QUESTION FROM SENATOR MARTIN HEINRICH

Plutonium Strategy

Q19. Under Secretary Gordon-Hagerty, you testified that there is no margin for further delay in modernizing NNSA's production capabilities. In light of the delay in completing the AoA, do you expect NNSA will still meet the DoD and statutory capacity requirements for pit production in 2030 enacted over three years ago in 50 USC 2538a and reconfirmed in the NPR?

A19. Yes. NNSA remains committed to supporting an enduring 30 pit per year production capability in 2026, and an 80 pit per year capability in 2030.

QUESTION FROM SENATOR MARTIN HEINRICH

Trusted Rad-Hard Strategic Microelectronics at Sandia Labs

Q20. Under Secretary Gordon-Hagerty, the recent Nuclear Posture Review reaffirmed the need to maintain a robust capability for both research and a dedicated source of trusted radiation-hardened micro-electronics systems. The MESA facility at Sandia Labs is aging and needs to be upgraded to meet future national security requirements after 2025. What is the status and timeline to upgrade MESA to maintain the advanced R&D and production capacity of rad-hard micro-electronics to meet the needs of both NNSA as well as other strategic partners?

A20. The Silicon Fabrication (SiFab) foundry at Sandia National Laboratories (SNL) produces radiation-hardened microelectronics for U.S. nuclear warheads. DOE/NNSA is working to extend this capability at SiFab beyond 2025. The SNL SiFab Recapitalization (SSiFR) project was initiated in 2012 to procure upgraded equipment over a 7-year period (ending in Fiscal Year 2019). As planned, this effort is nearing completion and the installation of the new, 8-inch equipment is scheduled. Real property upgrades to extend SiFab are in the planning process.

As a strategic partner, SiFab is also accredited as a trusted supplier by the Defense Microelectronics Activity, which manages the Department of Defense's (DoD) Trusted Foundry Program. DOE/NNSA continues to collaborate with the DoD as the DoD develops a comprehensive national strategy for government access to microelectronics.

QUESTION FROM SENATOR MARTIN HEINRICH

Laboratory-Directed Research and Development

Q21. Under Secretary Gordon-Hagerty, you testified that attracting and retaining a skilled workforce is critical to NNSA's mission. To that end, I continue to be a strong supporter of a modest set-aside of funding for Laboratory-Directed Research and Development (LDRD). The LDRD investment in high-risk, high-payoff activities supports the national security mission while allowing the labs' scientists to pursue innovative solutions to some of the nation's most challenging energy and national security problems. I am pleased that you testified that LDRD funding fosters innovation and helps attract and retain the workforce critical to our national laboratories.

Do you also support maintaining the NNSA lab directors' discretion to set aside up to 6% of funding for LDRD?

A21. The National Nuclear Security Administration is supportive of a robust Laboratory Directed Research and Development (LDRD) program. LDRD is a vital asset in recruitment of a world-class scientific workforce and is critical to the maintenance and development of scientific capabilities that serve energy and national security missions. The LDRD program provides a basis for continually engaging laboratory research staff in cutting-edge and challenging work, as well as providing education and training for the next generation of scientists.

QUESTION FROM SENATOR HEINRICH

NNSA's Albuquerque Office Complex

Q22. Under Secretary Gordon-Hagerty, I had the opportunity to tour NNSA's Albuquerque Complex in 2017. There are about 1200 federal workers housed in increasingly decrepit office buildings that date from the 1940s and 50s. The buildings do not meet even basic safety requirements. I strongly support plans to replace these inadequate facilities with a new LEED Gold building and am pleased the NNSA included funding in both the FY18 and FY19 budgets to fully fund the project. A groundbreaking will likely be scheduled soon and I hope you will plan to attend.

What is the status of the Albuquerque Complex project and when might construction begin?

A22. On Friday, April 20, the National Nuclear Security Administration's (NNSA) Project Management Executive approved the start of construction for the Albuquerque Complex Project. The United States Army Corps of Engineers awarded a construction contract to Caddell Construction Company on April 24, 2018. NNSA broke ground on this new state-of-the-art facility in July 2018 and expects to complete construction by the end of 2020.

QUESTION FROM SENATOR MARTIN HEINRICH

Q23. Under Secretary Gordon-Hagerty, I worked last year with your office on legislation in the FY18 NDAA to increase the statutory cap from $10 million to $20 million for general plan projects at NNSA labs and facilities. What is the status of the NNSA's implementation of the increased cap for GPPs as authorized by sec. 3119 of NDAA18?

A23. The increase in NNSA's General Plant Project (GPP)/Minor Construction threshold from $10 million to $20 million allows NNSA to address high-risk infrastructure deficiencies faster and more efficiently. As a result of additional funding provided in FY 2018, some projects have been accelerated. The current plan is noted below. NNSA has moved to implement this new authority quickly, and per the notification provided in NNSA's FY 2019 budget request, NNSA is planning the following 11 projects between $10 million and $20 million for execution beginning in FY 2018 or FY 2019:

- Three of the 11 projects are fully-funded in FY 2018:
    - Pantex – New Gas Analysis Laboratory
    - Lawrence Livermore National Laboratory – New AME Polymers and Engineering Facility
    - Los Alamos National Laboratory – TA-16-0303 Crystal Lab Refurbishment Portfolio
- Two of the 11 projects fund design in FY 2018 and construction in FY 2019:
    - Pantex – Building 12-37 Secondary Electrical Feed Installation
    - Sandia National Laboratories/CA – New Data Center Replacement Facility
- One of the 11 projects funds design in FY 2018 and construction in FY 2020:
    - Lawrence Livermore National Laboratory – Building 235 and Ancillary Synthesis Chemistry Laboratories Refurbishment with Fume Hood Upgrades

- Two of the 11 projects request full funding in FY 2019:
    - Los Alamos National Laboratory – Dual Axis Radiographic Hydrodynamic Test Facility Weather Enclosure Addition
    - Lawrence Livermore National Laboratory - Building 341 AME Mechanical Test Capability Consolidation Refurbishment
- Three of the 11 projects request design funding in FY 2019 and construction in FY 2020:
    - Nevada National Security Site – Mercury Modernization New Building 23-461
    - Lawrence Livermore National Laboratory - Building 151 High Level Radiochemistry Laboratories Refurbishment
    - Lawrence Livermore National Laboratory - New AME Joining Capabilities and Vapor Deposition Facility

QUESTION FROM SENATOR MARTIN HEINRICH

Domestic Production of Molybdenum-99

Q24. Under Secretary Gordon-Hagerty, NNSA currently provides funding to re-establish a domestic commercial supply of the radioactive isotope molybdenum-99 used for medical diagnostic procedures. What is your FY19 budget request for support of this important program?

A24. Our Fiscal Year 2019 request includes $10 million for laboratory support to develop domestic Mo-99 production technologies and implement cooperative agreements.

QUESTION FROM SENATOR MARTIN HEINRICH

Domestic Production of Molybdenum-99

Q25. Under Secretary Gordon-Hagerty, do you have a forecast of what NNSA plans to spend over the following two years?

A25. The Fiscal Year (FY) 2019 request includes a forecast of $10 million for both FY 2020 and FY 2021 for continued laboratory support.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

National Academies of Sciences Management Study

Q1a. Madame Administrator, last week, the National Academies released a report describing "the persistence of governance and management problems in the nuclear security enterprise, and the failure of past attempts to address them."

This Subcommittee has a long history of strong oversight of the agencies under its jurisdiction and has taken an active interest in finding solutions to many of the issues described in this particular report. We look forward to hearing more about your plans to take on these long-standing problems and to deliver a program that will successfully modernize the U.S. nuclear weapons stockpile and the supporting NNSA infrastructure.

What do you believe to be the highest priority management and operating issues that are impacting the NNSA's ability to successfully carry out its mission?

A1a. Effective governance and management of the nuclear security enterprise is a priority for me and is a topic I address routinely with the NNSA workforce, including Federal, management and operating (M&O), and contractor employees. NNSA is implementing a fully integrated, one team approach to mission execution. As part of this effort, we are working relentlessly to build mission awareness across the enterprise and to better integrate mission functions. Ensuring a productive and healthy relationship with our M&O contactors is critical to better mission integration. NNSA will begin to better define clear chains of command and improve accountability throughout the enterprise. With a systematic approach, balancing the burden and value of necessary oversight of our M&O contractors, we can empower the enterprise to execute our missions effectively and efficiently.

Strategic planning continues to be a key focus of NNSA and involves the entire nuclear security enterprise. We now issue annual Strategic Plans for each of our seven sites,

plants, and labs. Through strong strategic planning, we have a means for enhancing mission awareness and integration, building enduring and trusted relationships, improving communication, and strengthening collaboration across the enterprise.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

National Academies of Sciences Management Study

How do you intend to rebuild NNSA's credibility, specifically with regards to -

Q1b. the NNSA's ability to deliver its programs on time and within budget;

A1b. It is one of my highest priorities to ensure that all of NNSA's programs and projects are initiated, executed, monitored, and closed out efficiently and effectively, on time and within budget. NNSA is mindful of its obligation to be responsible stewards of the resources that Congress and the American people have entrusted to us. NNSA is taking the necessary steps to improve efficiency and effectiveness of its project management processes by:

- Improving management of ongoing major projects.

- Preparing cost estimates in a manner consistent with methods and best practices identified by U.S. Government Accountability Office (GAO).

- Conducting analyses of alternatives in a manner consistent with methods and best practices identified by GAO to provide unbiased and rigorously analyzed results.

Project management reforms across the Department and the creation of NNSA's Office of Acquisition and Program Management and Office of Cost Estimating and Program Evaluation have resulted in more effective cost estimating and project management. Over

the past two years NNSA has made significant achievements in the area of project management. For example, in 2013, GAO narrowed the focus of its NNSA High Risk List to major projects more than $750 million. Additionally, major construction projects, such as the Uranium Processing Facility in Oak Ridge, Tennessee, are being executed on schedule and on budget and NNSA's Life Extension Programs and Major Alteration also remain on schedule and within budget.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

National Academies of Sciences Management Study

How do you intend to rebuild NNSA's credibility, specifically with regards to -

Q1c. to consider an appropriate range of alternatives for its major acquisitions before presenting Congress with a funding request;

A1c. Project management reforms across the Department and the creation of NNSA's Office of Acquisition and Program Management and Office of Cost Estimating and Program Evaluation have resulted in more effective cost estimating and project management. As NNSA improves its overall program and project management capabilities through implementation of the Program Management Improvement Accountability Act, the performance of Alternatives of Analysis will also continue to improve, leveraging best practices from GAO and others from industry.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

National Academies of Sciences Management Study

How do you intend to rebuild NNSA's credibility, specifically with regards to -

Q1d. to operate with transparency in how funds are being used; and

A1d. In the last few years, the Department and NNSA have taken a number of steps to provide additional transparency in how funds are being used. NNSA reporting monthly financial data to Congress as part of DOE's Base Financial Report, including narrative explanations for unobligated and uncosted balances by fiscal year. NNSA is providing more data on infrastructure projects through reporting tools and additional data on overheads as part of Congressional reporting requirements.

NNSA's financial integration efforts will also advance NNSA's ability to provide more financial transparency. Financial integration will help achieve enterprise-wide standards of cost collection and lead to improved transparency of financial information. Financial integration is a multi-year effort that, once completed, should provide more information comparing costs across the nuclear security enterprise.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

National Academies of Sciences Management Study

How do you intend to rebuild NNSA's credibility, specifically with regards to -

Q1e. to improve its cost estimating so that we can fully consider the implications of the funding proposals that we are being asked to support?

A1e. Under my leadership and with strong congressional support, the NNSA Office of Cost Estimating and Program Evaluation (CEPE) has conducted a series of independent cost estimates for nuclear weapon life extension programs and, most notably, for the dilute and dispose alternative to plutonium disposition. These estimates have been conducted in accordance with GAO best practices and policies are in place for my review of both the independent cost estimate and program estimate prior to baselining the programs. In accordance with the Fiscal Year 2019 National Defense Authorization Act, CEPE will conduct independent cost estimates for capital asset projects that qualify as major atomic energy defense acquisition programs. This will ensure NNSA fully considers the risk and implications of funding activities needed to execute NNSA's mission. CEPE will also provide analytical and data support to the program offices to improve their cost estimating practices.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

MOX Termination

Q2a. The Fiscal Year 2018 National Defense Authorization Act allows the Secretary of Energy to terminate the project if DOE can provide a lifecycle cost estimate that shows the cost of the alternative is 50% of the cost of MOX.

We were informed that NNSA was preparing an interim cost estimate to certify that a cost estimate that meets the NDAA threshold exists, but that you were also developing a more comprehensive lifecycle cost estimate.

When will a comprehensive lifecycle cost estimate for dilute and dispose be provided to Congress?

A2a. NNSA will submit a comprehensive report to Congress on its plans to implement the dilute and dispose approach, including results of the lifecycle cost estimate (LCCE) upon completion of the independent validation of the estimate by the U.S. Army Corps of Engineers during FY 2019. In June 2018, NNSA began briefing the preliminary results of the dilute and dispose LCCE to congressional committees.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

MOX Termination

Q2b. What is the difference between the comprehensive lifecycle cost estimate that is under development and the one that might be submitted for the NDAA waiver?

A2b. The Cost Estimation and Program Evaluation Office (CEPE) prepared an Independent Cost Estimate of the dilute and dispose approach that was the basis for the Secretary's execution of the NDAA waiver. NNSA concurrently developed a detailed comprehensive lifecycle cost estimate (LCCE). Both estimates have similar results. The CEPE estimate range is $17.2B to $19.9B. NNSA developed the LCCE based on incremental costs to the Program to implement the dilute and dispose approach, which resulted in an $18B to-go cost. The CEPE estimate includes approximately $1.6B for other costs that are attributable to the dilute and dispose approach but are within other program budgets (i.e., Waste Isolation Pilot Plant operations and Office of Secure Transport shipping), so those costs are not directly included in the Program's LCCE. For comparative purposes, adding $1.6B to the LCCE produces a total estimate of $19.6B, which is within the CEPE estimate range.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

MOX Termination

Q2c. Do you intend to submit the NDAA certification and terminate the project, and if so, when?

A2c. On May 10, 2018, the Secretary transmitted to Congress the certification that allows the Secretary to waive the requirement to continue construction of the Mixed Oxide Fuel Fabrication Facility. This certification was later reaffirmed by the NNSA Administrator on September 14, 2018.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

MOX Termination

Q2d. If and when a waiver is submitted, will the estimate contain sufficient detail to allow Congress to conduct its oversight responsibilities?

A2d. On May 10, 2018, the Secretary transmitted to Congress the certification that allows the Secretary to waive the requirement to continue construction of the Mixed Oxide Fuel Fabrication Facility. This certification was later reaffirmed by the NNSA Administrator on September 14, 2018.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors Spent Fuel Recapitalization Project

Q3a. Admiral Caldwell, the Spent Fuel Recapitalization Project that's being carried out at the Naval Reactors Facility in Idaho is estimated to cost around $1.6 billion.

Do you have a cost and schedule baseline for the project? Do you foresee any difficulties in delivering the project within the current projected costs?

A3a. I approved the cost and schedule baseline for the Spent Fuel Handling Recapitalization Project on September 24, 2018. The Project was approved with a Total Project Cost (TPC) of $1,686,500,000 and has a planned completion date of June 30, 2025. During this process I approved an increase of $40 million to the TPC over the previous estimate to account for unanticipated cost increases due to market conditions. Based on the new TPC, I do not foresee any difficulties in delivering the project with the current projected costs.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors Spent Fuel Recapitalization Project

Q3b. What are the main risks to keeping those costs from rising and what is your strategy for cost containment?

A3b. The primary risks to cost increases are changes in market conditions, specifically in the areas of material costs, worker shortages, and labor rates. In order to contain these costs, the project is intently scrutinizing market conditions in both Idaho and nationally and exploring contracting strategies that can lock in prices and rates on material and labor that are subject to market volatility.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors Spent Fuel Recapitalization Project

Q3c. When does the project need to be completed to fully support the Navy's plans and what are the implications if there are delays?

A3c. The current funding profile supports project completion by the 3rd quarter of FY 2025. Each year of delay would require the Department of Defense to procure approximately $150 million of additional M-290 shipping containers for temporary storage of spent nuclear fuel and puts at risk Naval Reactors' commitment to the state of Idaho to process spent nuclear naval fuel and place it in dry storage in a timely manner.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Advanced Test Reactor

Q4a. Admiral, the Advanced Test Reactor (ATR) serves an important role for our nuclear navy, as well as for the Department's civilian nuclear energy research and development programs. ATR is an aging reactor that will require investment to keep it operating into the future. Your office works closely with the Office of Nuclear Energy (NE) to operate and maintain the reactor. There have been some discussions on how ATR should be managed and how costs should be shared between your office and NE.

Do you foresee Naval Reactors continue to need ATR for its research and development needs in the future?

A4a. Yes. For the foreseeable future Naval Reactors will rely upon ATR to irradiate naval fuel and materials specimens to improve future reactor designs. Naval Reactors is a primary user of the facility and we work closely with DOE-NE to ensure our mission is supported.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Advanced Test Reactor

Q4b. How do you asses the facility's condition to support NR's needs?

A4b. The development of the rolling 5-year "get-well plan" intended to upgrade ATR systems to improve plant reliability has enabled ATR to meet the needs of the Naval Nuclear Propulsion Program. Naval Reactors and DOE-NE have identified 210 irradiation days per year as an optimal balance of both operational time and plant down-time, in which maintenance and overhauls can be conducted using base funds for safety related systems and 5-year rolling plan funds to improve reliability.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Plutonium Pit Production

Q5a. Madame Administrator, the NNSA has pursued enhanced plutonium infrastructure capabilities on and off for many years. The last major project– the so-called "CMRR-Nuclear Facility"– was cancelled in 2013 when the project costs grew. There is no new project in the FY 2019 budget request but funding requested for "plutonium sustainment" is $361 million, or $176 million over FY 2017. This funding increases to $1.2 billion by FY 2023.

What are the main elements of the NNSA's present modernization program to enhance NNSA's plutonium capabilities and what is the total cost of establishing new pit production capacity?

A5a. The main elements of NNSA's efforts to modernize its pit production infrastructure and supporting capabilities, as laid out in the Department's Fiscal Year 2019 budget request, include the Plutonium Sustainment Program and the Chemistry and Metallurgy Research Replacement (CMRR) project. There are also supporting elements in NNSA's Maintenance and Repair of Facilities program and Recapitalization: Infrastructure and Safety program that address aging infrastructure and safety risks for plutonium production.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Plutonium Pit Production

Q5b. How much is requested in the fiscal year 2019 budget request to establish new pit production capabilities and in what funding lines?

A5b. The Plutonium Sustainment program funds production and certification activities, hiring of pit production personnel, and equipment necessary to reach 30 pits per year at Los Alamos National Laboratory (LANL). The CMRR project provides the necessary analytical chemistry and materials characterization capabilities to support pit production and other plutonium activities at LANL. The increase in the Plutonium Sustainment program reflects the inclusion of funding to repurpose the Mixed Oxide Fuel Fabrication Facility (MFFF) for pit production. A breakout of the funding associated with repurposing MFFF that was included in the Plutonium Sustainment program in the FY 2019 request is below:

	FY 2019 ($K)	**FY 2020 ($K)**	**FY 2021 ($K)**	**FY 2022 ($K)**	**FY 2023 ($K)**
Plutonium Sustainment Program	**361,282**	**691,284**	**745,485**	**978,889**	**1,189,491**
Plutonium Sustainment	*266,539*	*280,826*	*313,589*	*354,906*	*373,924*
Funding to Repurpose MFFF for pit production	*94,743*	*410,458*	*431,896*	*623,983*	*815,567*

The funding in Plutonium Sustainment continues efforts over the past several years to provide adequate funding for production activities at LANL and the Kansas City National Security Campus, certification activities at Lawrence Livermore National Laboratory, and increases to support pit production equipment and hiring of pit production personnel

at LANL. The costs associated with this program reflect estimates for production and certification activities, equipment, and hiring needs to produce 30 pits per year in 2026. The funding associated with repurposing MFFF for pit production is based on the high-end of Class 5 estimates (-20%, +100%) developed during the Plutonium Pit Production Engineering Assessment conducted in FY 2018. These estimates are based on the current level of pre-conceptual design for this project and will be updated as the project progresses towards Critical Decision-1.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Plutonium Pit Production

Q5c. Has the NNSA performed a cost and benefit analysis of how much pit production capacity is needed and how soon it could be established for a given amount of funding?

A5c. For more than two years, NNSA has analyzed what pit production capacity is necessary and evaluated alternatives to meet pit production requirements established by the Nuclear Weapons Council. The 2018 Nuclear Posture Review reaffirms the need to produce no fewer than 80 pits per year (ppy) by 2030. On May 10, 2018, NNSA provided Congress with the NNSA's recommended alternative to meet pit production requirements: repurposing the MFFF to produce 50 ppy and continuing efforts at LANL to produce 30 ppy. The NWC Chairwoman endorsed NNSA's recommended alternative in her May 2018 letter to Congress. The Nation can no longer delay critical investments in our pit production capabilities and the FY 2019 request reflects NNSA's intent to ensure that these efforts are reflected in the budget.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Infrastructure and Workforce

Q6a. Madame Administrator, the Nuclear Posture Review (NPR) released in early February emphasizes the need for investments in the NNSA's infrastructure and workforce.

How does this budget request reflect NNSA's workforce requirements?

A6a. To meet increasing mission requirements to have a fully functioning nuclear security enterprise, NNSA must have a workforce of appropriate size and capabilities. The Office of Personnel Management and the NNSA Office of Cost Estimating and Program Evaluation (CEPE) recently conducted studies and identified the need to increase NNSA's Full-time Equivalents to support the mission needs. Utilizing the results of these studies, NNSA is employing a human capital implementation plan to recruit and hire for agency mission critical occupations. Continuing to operate under current staffing constraints, without being able to address the increased mission needs for pit production, contributes to vulnerabilities in providing a safe, secure, and effective nuclear security program.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Infrastructure and Workforce

Q6b. Do you believe that NNSA has an appropriately sized and trained acquisition workforce in place to be successful at concurrently conducting all of these modernization programs plus new supplemental requirements in the NPR?

A6b. While NNSA's acquisition workforce is adequately trained, numerous internal and external workforce studies, including findings and conclusions from various GAO audits, have consistently determined that NNSA needs additional staff for the size of its acquisition and project management mission.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Infrastructure and Workforce

Q7a. Madame Administrator, GAO reports from the past several years show that NNSA has had challenges with financial integration across the nuclear security enterprise to enable identification of total program costs and with other kinds of financial and internal controls such as managing fraud risk.

A7a. Building on cost data collection requirements and processes currently being implemented within NNSA programs, NNSA will begin collecting FY 2018 financial integration data from all NNSA Management and Operating (M&O) contractors for NNSA programs using a common work breakdown structure and common cost elements in November 2018. NNSA will then start to analyze the data to determine what adjustments, if any, are required to help with program management.

In December 2013, Congress enacted legislation requiring NNSA to improve the financial integration of the nuclear security enterprise, including establishing common cost elements, work breakdown structures, and a technology solution. In June 2018, NNSA issued formal guidance for M&Os to provide Fiscal Year 2018 data, by month, using the financial integration approach.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Infrastructure and Workforce

Q7b. What steps is NNSA taking to address fraud risk management?

A7b. The Department of Energy establishes internal control and risk management processes and procedures which the Agency, as a whole follows, including NNSA. Consistent with these processes, NNSA has implemented the fraud risk requirements of revised OMB Circular A-123, which was informed by the GAO Framework for Managing Fraud Risk in Federal Programs.

NNSA's Office of Management and Budget oversees enterprise risk management and internal controls requirements at NNSA Headquarters, Field organizations and NNSA contractors. The DOE Office of Inspector General and the Office of the Chief Financial Officer (OCFO) provides fraud awareness training and NNSA encourages all organizations to participate.

The NNSA anti-fraud strategy is embedded in the NNSA Internal Controls Program. Implementation of OMB Circular A-123 requirements for risk profiles, including fraud risks, provides the processes necessary for managers to make resource decisions to mitigate residual risks.

NNSA's Risk Profile is incorporated into DOE's Risk Profile and is part of DOE's Fraud Risk Management, and is prepared and provided for use during the Strategic Review. In FY 2018, additional emphasis has been placed on fraud prevention in NNSA's Internal Control

tools to further increase fraud prevention activities across NNSA. NNSA Headquarters and Field elements, as well as NNSA Contractors, assess and identify top financial and non-financial fraud risks on an annual basis. When evaluating fraud, organizations assess fraud risk from the transaction-level to the entity-level. DOE/NNSA internal control focus area risks reflect increased emphasis across NNSA in the Acquisition Management and Contractor Oversight business processes.

All NNSA organizations (HQ/Field/M&Os) are responsible for evaluating and adapting activities to improve fraud risk management. An example of this is an NNSA M&O's Internal Audit Organization utilizing the Cooperative Audit Strategy and applying data analytic techniques to subcontractor payments, followed by focused follow-up on specific transactions rather than selecting a random sample of transactions to test.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

New Warhead Capabilities

Q8. Madame Administrator, the Nuclear Posture Review recommends the U.S. add two supplemental capabilities to the nuclear triad modernization program: a modification of an existing ballistic missile warhead to provide it a lower-yield option and a redeployment of a sea-launched cruise missile capability similar to that fielded by the U.S. for decades but retired by the Obama Administration in 2010.

Why are these two new capabilities needed? How will they enhance U.S. nuclear deterrence strategy?

A8. The additional capabilities are meant to strengthen deterrence by convincing adversaries the United States has credible and effective options at any level of escalation. These capabilities will provide additional diversity in platforms, range, and survivability.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

New Warhead Program Funding

Q9a. Madame Administrator, there is a significant lack of detail on how the NNSA would carry out the proposal for two new capabilities.

Is there any funding in the FY 2019 budget request to support either of these two new programs?

A9a. The FY 2019 amended budget request contained a $65 million request to support the modification of an existing ballistic missile warhead to provide a lower-yield option. In FY 2019, Congress appropriated $65 million for this option with the passage of the Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act, 2019 (Public Law 115-244).

NNSA did not request any money in the FY 2019 budget request to support the redeployment of a sea-launched cruise missile capability. NNSA will support the sea-launched cruise missile analysis of alternatives (AoA) as requested from the Department of Defense. NNSA will support these efforts through the Nuclear Weapons Council, but will not create a formal program until the AoA is concluded.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

New Warhead Program Funding

Q9b. How much do you estimate they will cost and when would they be delivered? What are the immediate steps you are taking, including any plans to use FY 2018 funds, and have you developed any programmatic plans yet?

A9b. NNSA estimates the low-yield submarine launched ballistic missile warhead modification program to cost $98 million, with further refinements to be made during FY 2019. NNSA will deliver the warheads within the requirements established by the Department of Defense for Initial Operating Capability (IOC) and Final Operating Capability (FOC) quantities and timelines.

In FY 2018 NNSA conducted W76 Life Extension Program (LEP) programmatic planning activities for the low-yield submarine launched ballistic missile warhead conversion. FY 2019 authorization and appropriations have been received and NNSA entered the engineering development and production phases on October 1, 2018.

The requirements for the sea-launched cruise missile have not been established. NNSA did not request any money in the FY 2019 budget request to support this effort. When warhead technical and IOC/FOC requirements are established, NNSA will then be able to estimate the cost and delivery schedule of this warhead.

No FY 2018 NNSA funds were expended towards program planning for a sea-launched cruise missile. NNSA will begin program planning upon receipt of requirements for this warhead.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Capacity for Stockpile Modernization Programs

Q10a. Madame Administrator, last summer, the Government Accountability Office (GAO) published a report that said the NNSA's nuclear modernization programs were already at high risk of delays and cost increases – and that was before the NPR and the announcement of additional modernization programs. The outgoing NNSA Administrator Gen (ret.) Frank Klotz appeared to confirm these risks when he told the press in January, *"We're pretty much at capacity in terms of people, although we're hiring more. We're pretty much at capacity in terms of the materials that we need to do this work. And pretty much at capacity in terms of hours in the day at our facilities to do this work."*

What role did DOE play in the interagency NPR review?

A10a. NNSA had representatives from the Offices of Defense Programs; Policy; and Defense Nuclear Nonproliferation supporting the interagency NPR working groups. These representatives' subject matter expertise supported the creation of the 2018 NPR.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Capacity for Stockpile Modernization Programs

Q10b. Did DOE or NNSA mention the cost and operational constraints when these new programs were being considered?

A10b. The estimated cost cited by the Congressional Budget Office includes both Department of Defense (DoD) and DOE/NNSA projected costs associated with the nuclear deterrent. NNSA worked closely with DoD regarding cost when these new programs were being considered. NNSA performed Enterprise Modeling and Analysis on all proposed options from an operational capacity, critical materials and workload standpoint. The outputs from this analysis were provided to the NPR working groups to support their decisions.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Capacity for Stockpile Modernization Programs

Q10c. Do you agree with your predecessor that the NNSA will be hard pressed to deliver additional work with the current capability of the NNSA's workforce and infrastructure?

A10c. The additional workload will be challenging and will require efficient and pro-active management of additional infrastructure investments and additional workforce resources. NNSA has managed and continues to actively manage the infrastructure, workload, and supply chains of the nuclear security enterprise incorporating changes directed by the 2018 NPR.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Long-Term Modernization Estimates

Q11a. Madame Administrator, even prior to the issuance of the 2018 Nuclear Posture Review, NNSA's Stockpile Stewardship and Management Plans indicated significant increases in its future budget plans. These increases raise concerns about the affordability of NNSA's planned portfolio of modernization programs.

Can the NNSA afford the scope of its current modernization program within existing budgetary targets, and if not, does the stockpile plan identify all additional needed resources?

A11a. NNSA's Stockpile Stewardship and Management Plan (SSMP) articulates NNSA's 25-year plan for the nuclear security enterprise. The FY 2020 SSMP will fully reflect the 2018 Nuclear Posture Review requirements on the enterprise as they exist today, and will provide an update on the affordability of the portfolio. NNSA's method for evaluating potential affordability is part of a portfolio management approach in line with the level of uncertainty affecting the out-years beyond the President's budget.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Long-Term Modernization Estimates

Q11b. If funding needs are not met, how would this affect the agency's overall modernization schedule?

A11b. If funding requests are not met, it will negatively impact NNSA's ability to modernize. NNSA will balance risk across the enterprise while keeping Congress informed of significant program changes.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Long-Term Modernization Estimates

Q11c. Will future modernization plans continue to include the estimates of the projected budget for the program to provide assurance that NNSA's program plans are aligned with budgetary plans?

A11c. Yes. The Stockpile Stewardship and Management Plan is updated and published annually, and includes NNSA's 25-year plan for the nuclear security enterprise. The FY 2019 SSMP includes budget information for the FY 2019 Future Years Nuclear Security Program (FYNSP), along with life extension program (LEP) schedules, preliminary infrastructure resource planning, and the long-term DOE/NNSA strategy through FY 2043 to ensure the Nation's nuclear deterrent.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

B61 Life Extension Program Cost Increase

Q12a. Madame Administrator, the budget request for the B61 Life Extension Program is $794 million, making it the single most expensive modernization program or project for fiscal year 2019. The NNSA's baseline cost for the B61 LEP is approximately $8 billion, but internal studies have warned that costs could rise to around $10 billion. In addition, while production is required to start in FY 2020 and be completed by the end of FY 2024, internal studies are predicting a delay of two years if current performance trends continue.

Is the B61 Life Extension Program on schedule and on budget? What are the risks of the program costing more or getting delayed?

A12a. The B61-12 Life Extension Program (LEP) is on schedule and on budget for a first production unit (FPU) by March 2020. The B61-12 has successfully completed all major milestones reported in the Selected Acquisition Report (SAR) including the recently completed September 2018 B61-12 System Final Design Review (FDR) validating the LEP's readiness to begin production. The System FDR assessed results of more than 60 ground and flight system tests to validate the B61-12 meets its safety, reliability, and security requirements in normal and abnormal environments. The LEP's budget execution is on track with the SAR cost baseline of $7.6 billion. Total cost for the program remains at $8.3 billion, which includes leveraging $648 million from other programs for technology maturation, and equipment scope.

Similar to other complex acquisitions, the B61-12 LEP is managing both technical and programmatic risks. The remaining technical risk in the design is low given the successful LEP test history, and the program will complete remaining system qualification tests in Fiscal Year 2019. Schedule risk is moderate due to piece part

hardware availability associated with first time production of very complex and tight tolerance nuclear weapon parts. The current schedule risk is measured in months not years and is closely managed with mitigation strategies by the B61-12 Federal Program Office. Currently, all major component's FPUs are on track to meet the system FPU in March 2020.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

B61 Life Extension Program Cost Increase

Q12b. When would NNSA inform the Committee that the program is at risk of exceeding the cost and schedule baseline?

A12b. NNSA is required to provide notification of not later than 30 days of cost overruns exceeding 125% of cost ($1.9 billion) or 150% increase in unit cost (unit cost is classified) (50 U.S.C. 2753). Currently, the B61-12 is on track with the cost baseline of $7.6 billion and completing production in FY 2025 as documented in the current B61-12 SAR. The Federal Program Office is in the process of updating the production cost estimate and associated risks in the Baseline Cost Report as part of Phase 6.5 authorization, scheduled for September 2019. NNSA's Office of Cost Estimating and Program Evaluation is also conducting an Independent Cost Estimate in parallel, which will inform the final updated estimate planned for release in September 2019.

Until the Phase 6.5 assessment is completed, NNSA will continue to provide quarterly updates to Congress on LEP progress and risks.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Integrated Warhead

Q13a. Madame Administrator, the fiscal year 2019 budget proposes $53 million to "restart Feasibility Study and Design Options" work on the Integrated Warhead or IW-1. When it was requested in fiscal year 2014, Congress did not appropriate funding for the IW-1 and the Navy later requested that the idea be shelved in order to carry out a separate refurbishment of the W88. The Nuclear Posture Review doesn't mention any requirement for integrated warheads.

Can you please provide us more information on why the NNSA is requesting funding for the IW-1 and how it relates to the Nuclear Posture Review?

A13a. There is no current stated military requirement for interoperability. The concept has merit, and feasibility will continue to be explored to inform future requirements validation. With the release of the 2018 Nuclear Posture Review (NPR), NNSA is no longer planning for an IW1 program as previously conceived and no longer uses the name "IW1"; however, for the FY 2019 budget request, prepared just prior to release of the NPR, NNSA used the existing "IW1" budget line out of necessity to identify funds for the W78 Replacement Program.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Integrated Warhead

Q13b. With the W88 Alteration Program well under way that will extend the life of that warhead for at least another 20 years, is there any military requirement for an integrated warhead?

A13b. It is NNSA's understanding from the Department of Defense that the previously planned IW1 warhead alone was not intended to replace the W88 warhead, but deployed concurrently with W88 warheads to rebalance sea-leg deployment for risk reduction against technical failure.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Inertial Confinement Fusion and Ignition

Q14a. Madam Administrator, the budget request proposes a decrease of $104 million, or 20%, for the scientific research on ignition and the experimental facilities that support that goal, including the National Ignition Facility, OMEGA Laboratory for Laser Energetics, and the Nike Laser at the Naval Research Laboratory. Though the NNSA constructed the National Ignition Facility, achieving ignition has so far been elusive.

What are the prospects for achieving ignition at NIF?

A14a. The Inertial Confinement Fusion 2020 Goal is exploring the efficacy of NIF to achieve ignition as currently configured or with upgrades. It is unlikely that the NIF will achieve ignition in its current configuration.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Inertial Confinement Fusion and Ignition

Q14b. Are there other uses for these experimental facilities if ignition cannot be achieved?

A14b. Yes. NNSA researchers around the complex rely on the high energy density experimental facilities to address key technical questions in the areas of thermonuclear burn, radiation transport and hydrodynamics, material properties, and outputs and survivability experiments for the Stockpile Stewardship Program.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Inertial Confinement Fusion and Ignition

Q14c. Are you proposing to shut down any facilities and what is your plan for experimental programs in this budget request?

A14c. NNSA is not currently proposing to shut down any experimental facilities. In February 2018, the President's budget proposed the initiation of a 3-year ramp down in funding for the Omega Laser Facility at the University of Rochester's Laboratory for Laser Energetics. This decision was made to ensure that within the FY 2019 President's Budget for NNSA, near-term scientific and technical issues of the highest priority to the Stockpile Stewardship Program would have sufficient experimental resources and access to facilities. Given the Congressional Appropriation levels for FY 2019, NNSA will maintain a program that includes operational funding for the National Ignition Facility, the Z Pulsed Power Facility, and the Omega Laser Facility in support of stockpile stewardship.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Surveillance of the Existing Stockpile

Q15a. Madame Administrator, nuclear weapons surveillance is the primary tool for you and for the Secretary of Defense to certify to the President that the stockpile is safe and reliable. NNSA has had difficulty in the past meeting its surveillance goals.

How does this budget request reflects investments NNSA has determined as needed for new technologies and approaches that allow weapons to be inspected more quickly and less expensively?

A15a. NNSA has identified high-priority investment projects and aligned available funding to those projects. This has resulted in work on advanced technologies with higher throughput, better data, and reduced cost per test (e.g., High Resolution Computed Tomography and laser gas sampling of pits). The budget request includes the funds needed to utilize tools to meet surveillance requirements, as well as the funding needed to address other similar needs (e.g., Accurate Detonator Advanced Performance Testing (ADAPT) for detonator surveillance, Neutron and Collimated Imaging of Canned Subassemblies (CSAs)). As opportunities for further improvement are identified, such as replacement of aging equipment, emerging technologies, and emerging data gaps, NNSA will continue to prioritize these needs and request appropriate funding.

Additionally, NNSA has made substantial progress in recent years in meeting surveillance requirements by employing a risk-based NNSA surveillance governance process that integrates Federal, Laboratory and Production Plants to ensure that prioritized surveillance requirements are identified and executed. This results in an

approved baseline plan for which the complex is held accountable for meeting surveillance objectives.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Surveillance of the Existing Stockpile

Q15b. How will the surveillance program be affected by the proposal in the NPR to continue to maintain the B83 – one of the oldest warheads in our nuclear arsenal?

A15b. Maintaining the B83 in the stockpile longer will require extension of surveillance requirements to align appropriately with the adjusted weapon system retirement date.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Uranium Enrichment Alternatives

Q16a. Madame Administrator, "unobligated" low enriched uranium is still needed for the production of tritium used in nuclear weapons, which needs to be periodically replenished to maintain those weapons systems. When the Paducah enrichment plant was closed in 2013, NNSA projected that its supply of enriched uranium would run out in 2027.

When do you estimate that NNSA's supplies of enriched uranium needed for national security purposes will run out?

A16a. NNSA's nearest term need for unobligated enriched uranium for national security purposes is for the production of tritium used in nuclear weapons. Ongoing NNSA efforts to down-blend excess material with no other disposition plan will extend this need date to 2041.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Uranium Enrichment Alternatives

Q16b. How much do you estimate building a new uranium enrichment capability will cost?

A16b. NNSA is currently conducting an Analysis of Alternatives (AoA) to recommend the solution(s) that will provide the best value to the American taxpayer. Depending on the technology selected, an independent cost review performed by the DOE Office of Project Management in December 2016 estimated that a construction project to meet the low enriched uranium for tritium requirement could cost between $3.4 and $14.1 billion from FY 2019 to FY 2038.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Uranium Enrichment Alternatives

Q16c. Will this planned new capability address all of DOE's needs for low enriched uranium or just its need for tritium?

A16c. The AoA is considering options that would address all of NNSA's needs for enriched uranium, including high-assay, low enriched uranium for nuclear nonproliferation, and highly enriched uranium for naval reactors.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Uranium Enrichment Alternatives

Q17. Madam Administrator, NNSA has two options it is developing for a future national security uranium enrichment facility – the AC100 centrifuge and a "small centrifuge" that NNSA has built a prototype of at the Oak Ridge National Laboratory. Both have challenges to deployment.

Can you please discuss why you are pursuing these two alternatives, what are the benefits and drawbacks of each technology, and when do you intend to make a decision on the preferred alternative?

A17. The AC100 centrifuge and the smaller centrifuge currently under development at Oak Ridge National Laboratory represent two different approaches to centrifuge design. The AC100, designed by Centrus Energy Corporation, formerly the United States Enrichment Corporation, is a large, mature machine and would require fewer units to achieve the desired output. However, the size and complexity of the AC100 may make it expensive to build and operate. The small centrifuge, while currently a less mature technology than the AC100, will be closer in size and complexity to the industry standard and may offer a less expensive solution for the NNSA mission need. As part of the DOE acquisition process, NNSA is currently conducting an Analysis of Alternatives (AoA) to recommend one or more solutions to meet the mission need. The AoA is scheduled to conclude in December 2019.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Nonproliferation Program Budgets

Q18a. Madame Administrator, the overall budget request for fiscal year 2019 for the NNSA nonproliferation programs is reduced from the fiscal year 2017 enacted level.

How will these reductions impact NNSA's nonproliferation mission?

A18a. The Administration is committed to pursuing an aggressive nonproliferation agenda.

NNSA actually requested more money in FY 2019 for its core nonproliferation, counterterrorism, and counterproliferation work than was requested in FY 2017. NNSA effectively requested the same amount as enacted in FY 2017, excluding legacy pension payments and the MOX construction program.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Nonproliferation Program Budgets

Q18b. What more can the NNSA do to address the highest risk nonproliferation threats?

A18b. As noted in the 2018 Nuclear Posture Review, nuclear nonproliferation will continue to face several enduring challenges: North Korea's nuclear provocations; uncertainty over Iran's nuclear ambitions; threat of China modernizing and expanding its nuclear forces; the danger of nuclear terrorism; and Russia's continued violation of arms control agreements. NNSA is committed to the administration's goal of achieving a final, fully verified denuclearization of the Korean Peninsula, and to ensuring Iran never acquires a nuclear weapon. To help the U.S. Government achieve these goals, NNSA will continue to engage with U.S. interagency and international partners to mitigate the threats posed by North Korea and Iran. NNSA will also continue to strictly control the spread of weapons-usable material, related technology, and expertise with the goal of preventing state actors from acquiring weapons of mass destruction (WMD). Further in that regard, NNSA will continue its work in the United States and abroad to keep WMD-usable materials protected from terrorists. Finally, NNSA will need to continue to work with U.S. interagency and international partners to strengthen the nonproliferation regime and ensure that arms control agreements are verifiable and enforceable.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

American Medical Isotopes Production Act (AMIPA) of 2012

Q19a. What are you doing to meet the goals of AMIPA and establish a reliable domestic supply source of Moly-99?

A19a. To meet the goals of AMIPA and support the establishment of a reliable domestic supply of Mo-99, NNSA has provided $100 million to U.S. commercial entities via cost-sharing cooperative agreements to accelerate Mo-99 projects to market. One of NNSA's cooperative agreement partners will begin producing Mo-99 for patient use in the United States by the end of 2018. In addition, NNSA issued a Funding Opportunity Announcement in July 2018, and will award $60 million of new cost-sharing cooperative agreements in early 2019. Separately, since 2010, NNSA has funded the national laboratories over $100 million to provide technical assistance to private industry in developing non-highly-enriched uranium (HEU) based Mo-99 technologies.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

American Medical Isotopes Production Act (AMIPA) of 2012

Q19b. Are any of the projects funded by NNSA's program supplying the domestic market and what do you consider to be the measure of success for this program?

A19b. One of NNSA's cooperative agreement partners received Food and Drug Administration approval in February 2018 to use its technology to produce Mo-99 in the United States and expects to begin supplying Mo-99 in the U.S. market by the end of 2018. NNSA considers the measure of success for this program to be sustainable, redundant Mo-99 production in the United States.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

American Medical Isotopes Production Act (AMIPA) of 2012

Q19c. What else should be done to prevent future domestic shortages?

A19c. NNSA will continue to provide financial and technical assistance to domestic industry to establish sustainable, redundant Mo-99 production in the United States and will continue to support the only remaining major global producer using HEU, to convert to LEU-based production as soon as possible. These complementary efforts, once completed, will significantly reduce the risk of any further domestic Mo-99 shortages.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Long-Term Mo-99 Strategies

Q20a. If those projects are successful, how long do you project the MURR reactor can operate and supply U.S. demand?

A20a. While there is no end of life planned at this time for the Missouri University Research Reactor (MURR), MURR has renewed its operating licensing until 2037, and will continue to provide irradiation services to produce Mo-99 for private industry during that period of time. Furthermore, NNSA is supporting multiple new technologies that do not require MURR or another research reactor to supply U.S. demand for Mo-99.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Long-Term Mo-99 Strategies

Q20b. Is DOE considering funding a longer-term solution?

A20b. The strategy of DOE/NNSA's Mo-99 program is to support a variety of Mo-99 production technologies to ensure that there is no single point of failure in U.S. Mo-99 production. While the first domestic project to market will use MURR, NNSA is continuing to support multiple new technologies that do not require research reactors to produce Mo-99. Over the long-term, this technological diversity will help ensure a reliable Mo-99 supply in the United States.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Conversion Programs for Moly-99 Production

Q21a. Is there a viable plan to convert any of those reactors to low-enriched uranium fuel?

A21a. The research reactors in the Netherlands, Poland and Czech Republic that currently provide irradiation services to produce Mo-99 have already been converted to low-enriched uranium (LEU) fuel. Belgium's BR-2 reactor is working to convert to LEU fuel and will do so as soon as a qualified fuel is available.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Conversion Programs for Moly-99 Production

Q21b. Will DOE continue to supply high-enriched uranium fuel for those reactors?

A21b. Belgium's BR-2 research reactor is the only remaining irradiator for Mo-99 production that uses highly-enriched uranium (HEU) fuel. Any export of HEU to the BR-2 would be in accordance with applicable U.S. export requirements.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Conversion Programs for Moly-99 Production

Q21c. For the record, how much funding has DOE spent to support Moly-99 production in foreign reactors to date?

A21c. DOE/NNSA has not spent any funding to support Mo-99 production in foreign reactors. However, NNSA has spent approximately $40 million to assist global producers in converting production facilities in South Africa, Netherlands and Belgium from HEU-based to LEU-based Mo-99 production.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

S8G Prototype Refueling

Q22a. Admiral Caldwell, the budget request contains $250 million, increase of $126 million over FY 2017, to refuel the S8G prototype reactor located in upstate New York. The Administration submitted a request for the Congress to consider additional funding above the budget request in fiscal year 2018 in order to reduce risks in this program.

What is the schedule for the refueling and is the program still on time and on budget?

A22a. The S8G Prototype Refueling Overhaul is on time and on budget. The FY 2019 appropriation of $250 million helps to ensure that the completion of this project will result in a viable research and development platform and training platform in the decades to come.

The prototype was shut down and ceased student training earlier this year in preparation for the refueling overhaul. Key milestones for the project are as follows:

- FY19 – Core manufacturing complete
- FY19 – Commence refueling operations
- FY20 – Complete refueling operations and prototype overhaul
- FY21 – Availability Complete

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

S8G Prototype Refueling

Q22b. Because the platform is a test bed for fuel under development, would delays to the refueling impacts to the schedule for the Columbia-Class ballistic missile submarine?

A22b. The S8G Prototype will be refueled with the Technology Demonstration Core (TDC). TDC core manufacturing development (which began in FY 2010) and production (scheduled to complete in FY 2019) will install Columbia-like fuel modules that are necessary to support a 40+ year life-of-the ship reactor core for the Columbia-Class submarine. Manufacturing of the Columbia-like fuel modules is complete, therefore any potential delays to the S8G Prototype Refueling Overhaul will not impact the schedule for Columbia-Class design and construction. However, the refueling overhaul is still important to the Columbia-Class in that the operation of the TDC core will provide data that will inform operating parameters for the entire class of Columbia-Class ships.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors Infrastructure

Q23a. Admiral Caldwell, this Subcommittee has strongly supported funding to address long-standing infrastructure issues in the NNSA's nuclear security enterprise, particularly deteriorating high-risk excess facilities left over from the Cold War. The budget request for general infrastructure for the Office of Naval Reactors is $76 million, or 17%, above the fiscal year 2017 level.

Can you please outline the status of Naval Reactors infrastructure?

A23a. Naval Reactors currently manages roughly 3.9 million square feet of facilities across the four Naval Nuclear Laboratory sites. These sites are over 60 years old and over half of the buildings and utility systems are operating beyond their original expected useful life. Replacing these older buildings and utility systems is required to minimize risks to operations and maintain compliance with environmental and safety regulations. In recent years, to provide high-priority fleet support and development work, Naval Reactors has prioritized maintenance and sustainment over recapitalization and replacement investments in facilities and infrastructure. This situation is not tenable for the long term. The rate of failure in deteriorating systems and the corresponding need to perform unplanned and urgent repairs to maintain site operations has increased. Additionally, there is an estimated $7.8 billion in environmental liabilities requiring decontamination and decommissioning efforts. Over half of this estimate is the cost to remediate and demolish currently inactive portions of facilities and structures. Due to historical operations and past accepted waste management practices, many inactive facilities require radiological and/or chemical remediation prior to dismantlement and removal.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors Infrastructure

Q23b. What are the most pressing needs and where are your highest infrastructure priorities in the budget request?

A23b. There are two distinct priority areas with Naval Reactors Operations and Infrastructure that are essential to the Naval Nuclear Propulsion Program going into FY 2019. First, the Program will be increasing its efforts in decontamination and decommissioning (D&D) older facilities that have been in existence since the start of the Program in the early 1950s. There are an estimated $7.8 billion in environmental liabilities requiring D&D efforts - about half of these facilities are no longer in use. The Program's positive track record on environmental safety is of the utmost importance, and is a core part of the Program's mission. FY 2019 funding in this area will enable the Program to reduce these outstanding liabilities and ultimately reduce the caretaking burden. The second focus area is recapitalizing Naval Nuclear Laboratory facilities and infrastructure systems, many of which have supported the Program since its inception over 60 years ago. Maintaining these laboratory facilities directly supports nuclear fleet operations and advanced research and development efforts.

QUESTION FROM REPRESENTATIVE CHUCK FLEISCHMANN

Y-12

Q24a. Y-12's role as the nation's Uranium Center of Excellence is fairly well known, but Y-12 is also home to the weapons complex's lithium mission. Current production work on this critical material is performed in Building Beta-2, which is currently 75 years old and in a state of significant degradation. The President's budget included $19 million to begin design work for the Lithium Production Capability Project at Y-12, which will reduce mission risk and improve safety by relocating the lithium mission to a new facility. Preliminary cost estimates for the project are in the neighborhood of $700 million.

Could you describe the status of the Lithium Capability Project and how NNSA is ensuring that nation's strategic lithium supply is maintained?

A24a. NNSA plans to build a new facility at Y-12 National Security Campus (Y-12) to replace the lithium work currently being done in Y-12 Building 9204-2. NNSA expects to achieve Critical Decision 1 (Approve Selected Alternative and Cost Estimate) in 2019. Congress approved the Lithium Processing Facility (LPF) as a new start in FY 2018. NNSA has also developed a lithium sustainment strategy to ensure supply for production needs and sustain the infrastructure necessary to fabricate lithium components until a new LPF is established. The Program of Record supply is sufficient through 2030.

QUESTION FROM REPRESENTATIVE CHUCK FLEISCHMANN

Y-12

Q24b. The proposed location for the new lithium facility is currently occupied by an excess facility known as the Biology Complex, a very dilapidated set of buildings that has been turned over to the Department's Office of Environmental Management for demolition. Just this month EM successfully tore down the first two Biology Complex buildings in this large, multi-year effort. DOE's budget justification lists NNSA's Top Ten High-Risk Excess Facilities, three of which—the three oldest of the ten—are at Y-12. Could you describe NNSA's efforts to prioritize risk reduction and preparation of these facilities for transition to EM for eventual D&D?

A24b. Approximately 10 percent of NNSA infrastructure is excess to program needs. Excess facilities are a drain on NNSA resources and pose risk to safety, security, and program objectives. These facilities require aggressive action at the site, NNSA, and department levels to disposition in a safe, timely, cost-effective manner and to manage risk associated with them until disposition. NNSA's highest disposition priorities are to stabilize degraded process-contaminated facilities, characterize their hazards and conditions, remove hazardous materials, and place them in the lowest risk condition possible for demolition by DOE's Office of Environmental Management (DOE-EM).

NNSA is focusing the majority of its disposition funding on managing the highest risks these excess facilities pose to our mission, the public, and the environment. NNSA is addressing these risks through site-proposed projects within the Recapitalization and Maintenance portions of the Infrastructure and Operations program.

For the three Top-Ten High-Risk Excess Facilities at Y-12 – Alpha-5, Beta-4, and Building 9206 – NNSA is making annual investments in risk reduction activities to

stabilize the facilities until eventual disposition by DOE-EM. Additionally, in Fiscal Year (FY) 2018, NNSA invested in deinventory activities at the three facilities to remove legacy materials. In FY 2019, NNSA is funding projects to isolate and reroute utilities at Alpha-5 and Beta-4. NNSA is also investing in the West End Protected Area Reduction Project (WEPAR), which will move Alpha-5 and Beta-4 outside the protected area, thereby enabling more efficient disposition by avoiding costly security escort expenses and time to process in and out of the protected area.

NNSA and DOE-EM have documented the requirements that must be met prior to transfer of these facilities to DOE-EM for disposition. NNSA will continue to work with partners in DOE-EM in the coming years to address these requirements to stabilize and prepare the facilities for transfer to DOE-EM.

QUESTION FROM REPRESENTATIVE CHUCK FLEISCHMANN

Stockpile Facilities

Q25. While the UPF will be a significant achievement towards modernizing the nation's nuclear infrastructure, NNSA must also continue to invest in the maintenance and operation of aging nuclear facilities that conduct operations critical to the national defense mission. For example, Building 9215 at Y-12 is over 60 years old and supports enriched uranium machining operations, and Building Beta-2E is about 50 years old and supports key stockpile management and sustainment activities. The missions of both of these facilities will remain integral parts of the overall weapons complex for the foreseeable future.

At Y-12, NNSA has established an Extended Life Program for aging nuclear facilities with critical enduring missions. Could you describe the efforts NNSA has made to date, and discuss how well NNSA is postured for the future, to reduce operational risk in its enduring nuclear facilities and to ensure their continued safe operation for the remainder of their mission lives?

A25. Safe, reliable, and modern infrastructure at NNSA's national laboratories and production plants is absolutely essential to the accomplishment of our vital national security mission and the well-being of our workforce. As the 2018 Nuclear Posture Review states, there is no margin for further delay in improving the state of NNSA's infrastructure.

To reduce operational risk and ensure continued safe operation, NNSA prioritizes projects within available resources. Standardized processes have been implemented to rank annual recapitalization, disposition, and maintenance activities across the enterprise. For example, NNSA uses a prioritization methodology that ranks investments to optimize risk reduction per dollar by evaluating key criteria for Recapitalization projects. Criteria evaluated include program requirements and risk reduction, safety risk reduction, increases in operational efficiency and/or productivity, and deferred maintenance reduction.

NNSA is also making strategic investments in extending the life of production facilities such as NNSA's uranium, lithium, and plutonium facilities. For example, NNSA has developed an Extended Life Program to extend the life of Buildings 9204-2E (Beta-2E) and 9215 at Y-12 to support NNSA's enriched uranium capability. These 1950s and 1960s-era facilities had been slated for retirement, but now are required to continue to operate until at least the 2040s. NNSA has established a portfolio of investments over the coming years to systematically address the risks posed by these aging facilities and modernize the facilities for operations to the 2040s. A second component of the Extended Life Program is evaluating safety risk reduction with an approved, Safety Strategy. Engineering evaluations have guided investment decisions implementing key activities such as Material at Risk reduction with the Area 5 De-inventory program and re-evaluating gaps, identifying practical upgrades, or accepting risk to operate the facilities against modern nuclear safety and design requirements.

NNSA is also applying the extended life program approach to the Y-12 plant lab (9995), which plays a critical role in processing samples for uranium and lithium missions at Y-12. Similar to 9215 and Beta-2E, the Plant Lab had been slated for retirement, but now will need to operate in the 2040s, and support the increased workload that is anticipated when the new Uranium Processing Facility and Lithium Processing Facility come online.

Beyond existing facilities at Y-12, NNSA is beginning to implement similar investment strategies for critical infrastructure maintenance and revitalization across the enterprise.

A subset of those investments are highlighted in NNSA's 2018 Master Asset Plan, which is NNSA's long-term infrastructure strategic plan.

QUESTION FROM REPRESENTATIVE CHUCK FLEISCHMANN

Nuclear Posture Review

Q26a. The 2018 Nuclear Posture Review (NPR) included two new supplements to the nation's nuclear forces: a low-yield submarine launched ballistic missile (SLBM) warhead and a modern nuclear-armed sea launched cruise missile (SLCM).

The NPR describes the low-yield SLBM as "a comparatively low-cost and near term modification to an existing capability." Describe the impacts the low-yield SLBM would have on operations at Y-12, including potential impacts to planned facility maintenance activities, staffing, and/or shift tempo. Include discussion of Figure 2-7 of the Fiscal Year 2018 Stockpile Stewardship and Management Plan, which shows projected out-year workloads for canned subassemblies at Y-12. If the impact to Y-12 operations has not been determined yet, please describe when and how NNSA will conduct this assessment.

A26a. The low-yield SLBM will have minimal impacts on operations at the Y-12 National Security Campus (Y-12), including planned facility maintenance activities, staffing, and/or shift tempo. The low-yield conversion is of a small number of warheads and there is no foreseen impact to staffing levels at Y-12. NNSA plans to leverage existing processes and personnel at the production sites to perform this conversion. With the production quantities planned and the ability to leverage existing processes and personnel, NNSA does not anticipate additional impacts to shift tempo.

QUESTION FROM REPRESENTATIVE CHUCK FLEISCHMANN

Nuclear Posture Review

Q26b. Similarly, please describe possible impacts to Y-12 operations from the new SLCM.

A26b. The requirements for the new sea-launched cruise missile have not been established. When NNSA receives the technical requirements and quantities from the Department of Defense, NNSA will analyze the impact, if any, to Y-12 operations.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Fiscal Impact

Q27a. It is important to understand the fiscal impacts of the proposed new nuclear weapons capabilities in the Nuclear Posture Review (NPR) before Congress starts down the path of implementing them. The NPR calls for a low-yield sea-launched ballistic missile and a low-yield sea-launched cruise missile.

Does NNSA plan to include these capabilities in its fiscal year 2019 Stockpile Stewardship and Management Plan?

A27a. The Department of Defense and NNSA, through the Nuclear Weapons Council, continue to translate the policy of the Nuclear Posture Review into requirements for the nuclear security enterprise. NNSA's FY 2019 Stockpile Stewardship and Management Plan (SSMP) includes a discussion about these capabilities as they were understood at the time of the SSMP's publication. NNSA's FY 2020 SSMP will include more detailed information on these capabilities.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Fiscal Impact

Q27b. When will NNSA provide this Committee with the Future Years Nuclear Security Plan for these capabilities?

A27b. NNSA's FY 2020-2024 Future Years Nuclear Security Plan will be delivered as part of the President's FY 2020 Budget Request.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Fiscal Impact

Q27c. What is the total estimated cost for each capability and when does NNSA expect each would be delivered?

Q27c. The estimate developed during FY 2018 to execute the desired modifications and qualifications for the submarine-launched ballistic missile, which is now referred to as the W76-2 warhead, is $98M, with further refinements to be conducted during FY 2019. NNSA will support the sea-launched cruise missile analysis of alternatives (AoA) as requested from the Department of Defense. NNSA will support these efforts through the Nuclear Weapons Council (NWC), but will not create a formal program until the AoA is concluded.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Impact to Current Modernization Program

Q28a. The NNSA is already working to modernize the existing arsenal, and with four ongoing life extension programs, there are very real capacity issues. In fact, former Administrator Klotz said in January that NNSA is "working pretty much at full capacity." It is critical that NNSA has the workforce and infrastructure necessary to complete the existing modernization effort, and that the impact to both on adding new work like the proposals in the NPR are well understood before undertaking these efforts.

What impact will the NPR will have on the current modernization program?

A28a. The Department of Defense and NNSA, through the Nuclear Weapons Council, continue to translate the policy of the Nuclear Posture Review (NPR) into requirements for the Nuclear Security Enterprise. NNSA's FY 2019 Stockpile Stewardship and Management Plan (SSMP) includes NPR impacts to the existing modernization plan as they were understood at the time of the SSMP's publication. NNSA's FY 2020 SSMP will include more detailed information and updates to the modernization plan based on the NPR.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Impact to Current Modernization Program

Q28b. How does the NNSA plan to mitigate those impacts?

A28b. NNSA uses a portfolio management approach to balance enterprise risk to cost, schedule and performance. NNSA will balance risk across the enterprise while keeping Congress informed of significant programmatic changes.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Nuclear Posture Review – Impact to Current Modernization Program

Q28c. How will NNSA ensure it has the workforce needed to complete all of these activities?

Q28c. Providing the necessary capabilities to support all phases of the nuclear weapon life cycle depends on a workforce with specialized skills in a broad array of technical fields. Recruiting, retaining, and training the current and future workforce in essential areas of expertise are critical to mission delivery.

To meet increasing mission requirements to have a fully functioning nuclear security enterprise, NNSA must have a workforce of appropriate size and capabilities. The Office of Personnel Management and the NNSA Office of Cost Estimating and Program Evaluation (CEPE) recently conducted studies and identified the need to increase NNSA's Full-time Equivalents to support the mission needs. Utilizing the results of these studies, NNSA is employing a human capital implementation plan to recruit and hire for agency mission critical occupations. Continuing to operate under current staffing constraints without being able to address the increased mission needs for pit production, contributes to vulnerabilities in providing a safe, secure, and effective nuclear security program.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Cost of Current Modernization Program

Q29a. The Congressional Budget Office has estimated the cost of sustaining, operating and modernizing our nuclear deterrent to be $1.2 trillion over 30 years. This is before taking into account the Nuclear Posture Review. So far, this has required significant increases to the Weapons Activities account, which will be difficult to sustain year over year given limited federal funds.

Does NNSA agree with this estimate? If not, why not?

A29a. The estimated cost cited by the Congressional Budget Office includes both Department of Defense (DoD) and DOE/NNSA projected costs associated with the nuclear deterrent – inclusive of modernization, operations and sustainment, nuclear command, control, and communications (NC3), and the weapons laboratories. NNSA cannot comment on the total projected cost of the nuclear deterrent given the inclusion of DoD's project costs.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Cost of Current Modernization Program

Q29b. When do the costs of recapitalizing our nuclear arsenal peak, based on the current program of record?

A29b. Recapitalizing the ageing U.S. nuclear arsenal requires costs for both NNSA and the Department of Defense (DoD). NNSA cannot comment on the total cost profile given the necessary inclusion of DoD programs. In its 2017 report, the Congressional Budget Office projected that recapitalization costs will peak in the early 2030s.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Cost of Current Modernization Program

Q29c. How much will the proposed sea-launched ballistic missile and keeping the B83 in the stockpile add to the cost of the current program of record?

A29c. The estimate developed during FY 2018 to execute the desired modifications and qualifications for the submarine-launched ballistic missile, which is now referred to as the W76-2 warhead, is $98M, with further refinements to be conducted during FY 2019. NNSA was appropriated $65M in FY 2019 for the W76-2 program. On August 28, 2018, the Nuclear Weapons Council (NWC) authorized retention of the B83-1 beyond the date stated in NSPM-12, Fiscal Years 2018-2023 Nuclear Weapons Stockpile Plan. DOE/NNSA is planning, scheduling, and budgeting required program activities to maintain the B83-1 through the NWC-determined retirement date.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Cost of Current Modernization Program

Q29d. How much will the proposed sea-launched cruise missile add to the cost of the current program of record?

A29d. The requirements for the new sea-launched cruise missile have not been established. Until NNSA receives the technical requirements and quantities from the Department of Defense, NNSA cannot estimate the costs of the program.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

B83

Q30a. The Departments of Defense and Energy committed to Congress in 2013 that the B83 gravity bomb would be retired. However, the Nuclear Posture Review proposes to keep the B83 around indefinitely.

How long can the NNSA retain the B83 without performing an alteration and/or life extension program?

A30a. The 2018 Nuclear Posture Review (NPR) guides NNSA to "retain the B83-1 until a suitable replacement is identified". In 2025, alteration programs to replace the limited life components (LLCs), the Gas Transfer System (GTS) and Neutron Generators (NGs), could be required in addition to a new Joint Test Assembly (JTA) for surveillance flight testing. The development and qualification of these activities would need to commence in 2022.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

B83

Q30b. From a technical standpoint, what actions would be required to keep the B83 operating past fiscal year 2019?

A30b. Through 2025, the required actions to maintain the B83 include continued GTS LLC exchanges (LLCEs) with existing hardware, sustained routine maintenance and repairs, and continuation of the annual surveillance activities required to assess the safety and reliability of the B83 weapon system. Beyond 2025, alteration programs to replace the GTS and NGs could be required in addition to a new JTA design for surveillance flight testing. NNSA's FY 2020 SSMP will include more detailed information and updates on the B83 program.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

B83

Q30c. What activities would be required in fiscal years 2020 and beyond, and what is the anticipated cost by fiscal year?

A30c. The B83-1 gravity bomb holds at risk a variety of protected targets. The 2018 Nuclear Posture Review directs sustaining the B83-1 past its current planned retirement date until a suitable replacement is identified. NNSA is coordinating with DOD to determine the period for sustaining the B83-1 and the schedule for restarting limited Alt 353 and Alt 753 programs if necessary. Retaining the B83 in the stockpile costs approximately $40-50M annually. If the B83 is required to remain in the stockpile beyond FY 2025, the additional costs of alteration programs and a new JTA design could be required.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Defense Nuclear Nonproliferation

Q31a. Administrator Gordon-Hagerty, as you know the Defense Nuclear Nonproliferation program plays a critical role in our national security efforts, including verification of treaties and arms agreements and working to keep nuclear materials out of rogue actors. DNN should see an increase in funds as the global threat environment intensifies, given the importance of preventing nuclear materials from falling into the wrong hands. At the very least, DNN must receive stable funding even as the Weapons account balloons.

As the new NNSA Administrator, what role do you see for non-proliferation efforts?

A31a. NNSA's Defense Nuclear Nonproliferation program plays several key roles. First and foremost, under U.S. law, the Department of Energy (DOE) is the U.S. Government's repository of technical expertise on the development, production, verification, and disposition of nuclear weapons and nuclear materials, including all aspects of the verifiable dismantlement of the nuclear fuel cycle. DOE/NNSA is an active participant in the interagency process run by the National Security Council, providing guidance on nuclear weapons, nuclear materials, and the nuclear fuel cycle. Additionally, DOE/NNSA works with international partners and the International Atomic Energy Agency (IAEA) to prevent the spread of materials, equipment, technology, and expertise that could be used in weapons of mass destruction. In particular, as part of our support to IAEA's broader safeguards mission, DOE/NNSA provides technical support, training, and expertise to the IAEA to strengthen their ability to monitor and verify nuclear activities worldwide. Finally, NNSA aims to maintain a balance between the promotion of legitimate nuclear commerce and controlling the spread of weapons usable material, equipment, technology, and expertise. NNSA's nuclear nonproliferation programs play a

critical role in helping ensure that such exports take place in accordance with the highest nonproliferation standards.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Defense Nuclear Nonproliferation

Q31b. From your viewpoint, what are the next big challenges in non-proliferation, and how do you plan to address those challenges?

A31b. As noted in the 2018 Nuclear Posture Review, nuclear nonproliferation will continue to face several enduring challenges: North Korea's nuclear provocations; uncertainty over Iran's nuclear ambitions; threat of China modernizing and expanding its nuclear forces; the danger of nuclear terrorism; and Russia's continued violation of arms control agreements. NNSA is committed to the administration's goal of achieving a final, fully verified denuclearization of the Korean Peninsula, and to ensuring Iran never acquires a nuclear weapon. To help the U.S. Government achieve these goals, NNSA will continue to engage with U.S. interagency and international partners to mitigate the threats posed by North Korea and Iran. NNSA will also continue to strictly control the spread of weapons-usable material, related technology, and expertise with the goal of preventing state actors from acquiring weapons of mass destruction (WMD). Further in that regard, NNSA will continue its work in the United States and abroad to keep WMD-usable materials protected from terrorists. Finally, NNSA will need to continue to work with U.S. interagency and international partners to strengthen the nonproliferation regime and ensure that arms control agreements are verifiable and enforceable.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Suppliers for NNSA Stockpile Work

Q32a. As NNSA continues to work through stockpile modernization efforts, there is certainly a need for materials and supplies.

What efforts does NNSA undertake to ensure that it has adequate suppliers for its many needs?

A32a. NNSA programs monitor the Nuclear Security Enterprise supply chain through their Managing and Operating (M&O) contractors. M&O contractors ensure the adequacy of their supply base by performing technical capability and quality assurance assessments. Technical capability assessments ensure that suppliers employ technically trained and competent engineering personnel who understand the first principles of engineering, and also ensure that suppliers have established stable engineering and analysis capabilities that meet NNSA requirements. Quality assessments ensure suppliers comply with DOE Order 414.1D, NAP-24A, and NQA-1 requirements; employ technically trained and competent manufacturing and inspection personnel; have established stable manufacturing and quality assurance capabilities with appropriate equipment that can measure product conformity and identify/correct issues; and can deliver products that meet DOE/NNSA requirements. Suppliers also must have an established process to manage their sub tier supply base.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Suppliers for NNSA Stockpile Work

Q32b. Specifically, how does NNSA survey companies around the country that may have specialized materials or services that can meet NNSA's needs?

A32b. NNSA's M&O contractors attend forums, conferences, and workshops throughout the year to find new suppliers that have specialized materials or services that can meet NNSA's needs. Additionally, each M&O contractor has a website, which provides guidance and opportunities for upcoming and ongoing mission work to interested companies.

NNSA contractors are surveyed as directed by DOE/NNSA requirements defined in DOE O 414.1D, NAP-24A, and NQA-1. The survey process for each of these requirements includes a technical capability assessment, a quality assurance assessment against the appropriate DOE/NNSA requirements, and a re-assessment of supplier quality assurance requirements on a periodic basis as defined in DOE/NNSA requirements.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Suppliers for NNSA Stockpile Work

Q32c. In particular, how does NNSA ensure outreach to small businesses beyond those in the states where NNSA sites are located?

A32c. NNSA, through its federal staff and facilities management contractors, attends a wide range of small business outreach events, industry days, and conferences nationwide. In addition, NNSA leverages the outreach materials found through the Department of Energy's Office of Small and Disadvantaged Business Utilization (OSDBU) website. The OSDBU website serves as the gateway for any small business to access a number of useful services, programs, points-of-contact, and other useful resource links. Finally, NNSA posts sources sought announcements and solicitations to both the Federal Business Opportunities and FedConnect websites that are available for contractor consideration nationwide.

QUESTION FROM REPRESENTATIVE MARCY KAPTUR

Interoperable Warhead

Q33. The fiscal year 2019 budget proposes funding to "restart Feasibility Study and Design Options" work on the Integrated Warhead or IW-1. When it was requested in fiscal year 2014, Congress did not appropriate funding for the IW-1 and the Navy later requested that the idea be shelved in order to carry out a separate refurbishment of the W88. The Nuclear Posture Review doesn't mention any requirement for interoperable or integrated warheads.

Why is NNSA requesting funding for the IW-1 when the NPR calls for extending the W78 warhead? Does NNSA view the IW-1 and the W78 as interchangeable?

A33. With the release of the 2018 NPR, the NNSA is no longer planning for an IW1 program as previously conceived and no longer uses the name "IW1"; however, for the FY 2019 budget request, prepared just prior to release of the NPR, NNSA used the existing "IW1" budget line out of necessity to identify funds for the W78 Replacement Program. The IW1 program's goals were to: 1) replace capability provided by the aging W78; 2) rebalance sea-leg deployment to reduce risk against technical failure; and 3) along with IW2, enable replacement of capability provided by the W88. While IW1 and W78 replacement are not entirely interchangeable, one of the IW1 program's goals was to address the aging W78.

QUESTION FROM SENATOR HOEVEN

Q1. Do you still project that the refurbished W80-4 will be produced in Fiscal year 2025? If not, when would you expect to complete work on the first refurbished W80-4?

A1. The current program of record maintains a first production unit (FPU) for the W80-4 Life Extension Program (LEP) in Fiscal Year (FY) 2025. Annual continuing resolutions have stressed the National Nuclear Security Administration's (NNSA) ability to hold to a FY 2025 FPU and added an increasing amount of risk to that date. Maintaining alignment between the Air Force and NNSA program schedules is critical to overall program success, and NNSA closely synchronizes efforts on the W80-4 LEP with the Department of Defense's (DoD) Long-Range Standoff need dates. NNSA and DoD will refine program goals and define interface scope as NNSA enters Engineering Development (Phase 6.3) in FY 2019.

QUESTION FROM SENATOR SHAHEEN

Cyber Threats

Q1. Cyberattacks are a growing concern, as evidenced by recent media reporting regarding Russian cyberattacks on our nuclear power plants. Given the evolving threat environment and the use of cyberattacks as an asymmetric weapon, what additional measures are you prepared to implement that would protect our nation's nuclear weapons from cyberattacks, whether they are from a nation-state or non-state actor?

A1. The increase in sophistication and persistence of our adversaries' offensive cyber capabilities has created new challenges and risks for our networks and systems. Potential adversaries are expending considerable efforts to exploit vulnerabilities and use cyberattacks against networked systems. The National Nuclear Security Administration (NNSA) has implemented management, operations, and technical security safeguards throughout the nuclear security enterprise to maintain adequate protection of information, networks, systems, and information assets. The cybersecurity tools deployed, and the workforce that develops and uses them, provide the first lines of defense against known adversaries and emerging threats. NNSA has implemented oversight and peer reviews of its Cybersecurity Program elements, led by personnel from NNSA's Office of the Chief Information Officer, and NNSA's field offices. The Department of Energy's Office of Enterprise Assessment also conducts cybersecurity reviews of NNSA labs and plants. These reviews provide valuable information to the sites, such as best practices and lessons learned across the nuclear security enterprise, and include improved methods for requirements traceability and implementing program enhancements in the face of increased cybersecurity demands.

QUESTIONS FROM SENATOR SHAHEEN

Cyber Threats

Q2. Who is the individual in the federal government responsible for cyber policy/programs?

A2. Per Executive Order 13833, it is the executive branch's policy to empower agency Chief Information Officers to ensure that information technology (IT) systems enable agencies to accomplish their missions; modernize IT infrastructure and improve the delivery of digital services; and improve the management, acquisition, and oversight of Federal IT. The Secretary of Energy possesses ultimate authority and responsibility for cybersecurity for the Department. Within the National Nuclear Security Administration (NNSA), the Under Secretary for Nuclear Security and Administrator of NNSA has been given the responsibility and authority for cybersecurity. The Administrator has delegated the responsibility for the development and implementation of the cybersecurity program, and cybersecurity policies and procedures, to the NNSA Associate Administrator for Information Management and Chief Information Officer.

QUESTION FROM SENATOR SHAHEEN

Naval Reactors

Q3. The responsibilities of the DOE include providing support to Naval Reactors and their capabilities to power our Navy's nuclear fleet. Given the critical importance of the sea-based leg of our nuclear triad, coupled with the plan of the Navy to increase its battle fleet to 355 ships including submarines, does the National Nuclear Security Administration (NNSA) have the necessary facilities and infrastructure to adequately support Naval Reactors over the long-term?

A3. Naval Reactors' current and future DOE facilities and infrastructure, as laid out in the Future Years Nuclear Security Plan presented in the Fiscal Year 2019 President's Budget request, are adequate to support the Navy's ramp-up to 355 ships.

Part of the Navy's plan to get to and maintain 355 ships includes the development of a new design fast attack submarine with a planned authorization in the 2030s as presented in the Navy's 30-Year Shipbuilding Plan. Identification of needed operational capabilities and technology development efforts have recently begun. Over the next decade, Naval Reactors will be supporting ship concept studies, which will likely include evaluation of a new nuclear propulsion plant design. Initial studies will inform the types of additional testing or laboratory facilities that will be needed to support a potential new nuclear propulsion plant design. These studies will utilize existing NNSA-funded resources dedicated to developing advancements in nuclear reactor designs as well as resources coming off the COLUMBIA nuclear propulsion plant design which completes in the late 2020s. Additionally, some existing NNSA/DOE facilities and infrastructure (e.g. core examination facility and the Advanced Test Reactor) will need to be recapitalized or have their service life extended to support the in-service fleet as well as future reactor design efforts.

QUESTION FROM SENATOR SHAHEEN

Naval Reactors

Q4. Given the Department of Defense plan to grow the Navy battle fleet to 355 ships, which will include a significant increase in the number of submarines, what is your long-term projection plan for the growth of Naval Reactors funding in order to provide sufficient support to the shipbuilding plans for the Department of Defense?

A4. Part of the Navy's plan to get to 355 ships includes development of a new design fast attack submarine with planned authorization in the 2030s as presented in the Navy's 30-Year Shipbuilding Plan. As requirements are defined, estimates for this new propulsion plant design will be developed and reflected in future budget submissions.

Naval Reactors' DOE funding levels are largely based in five areas:

- Naval Reactors Development (NRD) supports technology development for both in-service and new design nuclear propulsion plants;

- Naval Reactors Operations and Infrastructure (NOI) supports maintenance and operations of facilities at our four sites, regulation, compliance and protection, management of spent nuclear fuel, decontamination and decommissioning (D&D) of retired facilities, and operation and maintenance of our research reactor facilities;

- Project specific funding to support new design nuclear propulsion plants for naval application (e.g. COLUMBIA-Class propulsion plant design), or recapitalization of our nuclear training infrastructure (e.g. land-based prototype), or our spent fuel handling facilities (e.g. Spent Fuel Handling Project);

- Facilities recapitalization via General Plant Projects and Major Construction Projects; and

- Program Direction (PD) which funds federal salaries and benefits, travel, and training programs for personnel at Naval Reactors Headquarters and field offices.

Naval Reactors' base funding (NRD, NOI, and PD) levels are not specifically tied to the number of nuclear ships, but are more proportional to the age of the fleet and infrastructure, number of different reactor plant types in operation, and level of technology development required to support the current and future nuclear fleet. Therefore, changes in technology development and facility recapitalization, will largely drive funding levels in our DOE budget requests.

QUESTION FROM SENATOR SHAHEEN

Nuclear Posture Review

Q5. The Navy has a well-established system of bases and facilities to support its ballistic missile submarines, which make up a key component of our nuclear triad. The Nuclear Posture Review calls for a Sea-Launched Cruise Missile. Do we have the existing platforms and base infrastructure, to include sufficient security, to support a Sea-Launched Cruise Missile?

A5. Based on the guidance established by the 2018 Nuclear Posture Review, the Department of Defense (DoD) will initiate a capability study leading to an Analysis of Alternatives (AoA) for the rapid development of a modern sea-launched cruise missile (SLCM). I would defer questions related to platforms and base infrastructure to the DoD.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Plutonium Pit Production

Q1. NNSA has proposed a strategy to produce plutonium pits at both Los Alamos National Laboratory in New Mexico and the Savannah River Site in South Carolina. For this strategy to be successful, it requires more than funding, but rather a highly integrated approach for risk management, infrastructure, operations, and workforce training.

Is the NNSA working on an implementation plan and what is the anticipated completion date?

A1. NNSA developed the Preliminary Pit Production Implementation Framework, which is an internal document identifying early actions associated with NNSA's plans to produce no fewer than 80 pits per year by 2030. The framework was designed to address specific risks, including technical and operations risks, safety and security risks, and risks associated with building the necessary skilled production and support workforce required to meet the military requirement. Pursuant to the *John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232),* NNSA will provide a briefing to the congressional defense committees detailing the findings of the Preliminary Pit Production Implementation Framework. The Office of Defense Programs will consolidate the preliminary framework's contents into an integrated program schedule incorporating planning activities at Los Alamos National Laboratory (LANL), Savannah River Site (SRS), and other sites.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Uranium Processing Facility

Q2a. NNSA is in the process of constructing the Uranium Processing Facility (UPF) and has committed to delivering the project in 2025 with a total project cost of $6.5 billion.

What is the status of the project, what are the primary risks, and has NNSA encountered (realized) any of those risks? Has any scope been removed from the project to keep within the $6.5 billion cost target?

A2a. UPF supports decreasing mission dependency on Building 9212 at Y-12, a 70-year-old enriched uranium operations facility, and will also provide capability for casting, special oxides, and salvage of uranium. The UPF project was baselined in March 2018 for $6.5 billion, with a project completion date of December 2025. The project remains on budget and on schedule.

UPF project risks include hiring sufficient craft personnel and start-up and transitioning to operations in the new facility. Given market dynamics in the southeast, the project has to compete to attract sufficient craft personnel to support a major ramp up in construction over the next year. To mitigate this risk we have planned incentives to recruit individuals with the necessary skills and expertise and meet established hiring goals. There are anticipated risks associated with transitioning major nuclear operations to a new facility such as hiring and training operators on new specialized equipment. Mitigation strategies have been developed and will be initiated if these risks begin to be realized.

Q2b. Is there a schedule for a supplemental environmental impact statement that addresses the major changes of the UPF design from the “big box” approach?

A2b. The Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (SEIS) was completed in 2011 and analyzed the potential environmental impacts of five alternatives for ongoing and foreseeable future operations and activities at Y-12, including the original ‘big box’ approach envisioned for UPF. In 2014, NNSA revised its strategy and pursued a hybrid approach of upgrading existing facilities and building new UPF facilities. While there was no change in Y-12’s mission, a Supplemental Analysis (SA) that focused on the new approach was conducted in 2016. The SA found “no significant new circumstances or information relevant to environmental concerns that warrant preparation of a supplemental or new EIS,” and that no further NEPA document was required to execute the current strategy. In 2018, in response to concerns raised by new information brought to NNSA’s attention by local activist groups, Y-12 completed an additional SA for the SEIS examining this new information. After examining this new information, the SA found that the new information did not change the conclusions made in the 2016 SA. Construction on the new UPF facility and the upgrading of legacy facilities continues.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Kansas City Plant

Q3. The 1,000,000 square foot Kansas City Plant (KCP) stands in marked contrast to many NNSA facilities in that it is modern, having been constructed in 2012. It is the Committee's understanding, however, that it is also too small and that NNSA is looking to lease an additional 500,000 square feet of office and warehouse space to accommodate the projected workload and ensure KCP is not a choke-point for modernization efforts.

How does the budget request support obtaining additional space for KCP and what analysis has NNSA completed to be certain that leasing is the best option?

A3. The FY 2020 President's Budget Request includes funding for short-term leases and tenant improvements, but it does not include a request for additional space at Kansas City.

NNSA is taking an integrated look at Kansas City's role in weapons modernization to validate the infrastructure requirements identified by our Management and Operating contractors. NNSA is currently leading a Strategic Infrastructure for Non-nuclear Components Planning study to identify and analyze strategies for meeting the long-term infrastructure requirements at Kansas City to support the weapons mission.

To meet immediate mission infrastructure requirements, Kansas City requires additional space starting in Fiscal Year (FY) 2019. While the long-term study is being conducted, NNSA has identified two short-term, additional leases to meet immediate workload and mission demand. Building 22 is an 80,000 square foot office facility with a three–year, firm-term lease with three one-year options. This lease was signed in FY 2019. Building

23 is an approximately 250,000-300,000 square foot light manufacturing facility and the lease is expected to be signed in the near future.

While NNSA has determined a short-term lease is an economical interim solution to meet the current increased demands, the long-term infrastructure strategy at Kansas City is still being studied. The study will evaluate cost, schedule, and risk and identify strategies that maximize permanent investments to meet the long term needs for each strategy. A determination will then be made on the best value to the Government.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Naval Reactors

Q4. The budget request for development of the reactor for the Columbia-Class ballistic missile submarine is $75.5 million, which decreases from 2019 according to the project's funding profile.

With the Navy preparing to start construction of the first Columbia submarine, can you provide an update on the status of the reactor system and if you will remain on schedule and budget for all milestones?

A4. Naval Reactors is supporting construction of the first COLUMBIA-Class submarine by developing a reactor plant with a life-of-ship core that will be in service for more than 40 years.

Earlier this year, Naval Reactors placed the reactor plant long-lead procurement contract with Navy funding (Shipbuilding and Conversion, Navy (SCN)), including the reactor core to support the shipyard's build plan. The contract was placed on time, following design efforts that began in 2010, and we expect to remain on schedule and on budget in support of COLUMBIA construction beginning in FY 2021 and delivery in FY 2028.

Naval Reactors' FY 2020 Department of Energy budget request provides the necessary engineering, testing, and analysis to ensure the lead reactor plant supports the construction and test plan. The funding will continue to support oversight and evaluation of component designs and fabrication efforts, as well as operational safety analysis efforts.

QUESTION FROM THE HOUSE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Medical Isotopes Production

Q5a. NNSA has a program to help establish domestic production for the medical isotope Moly-99 without the use of highly-enriched uranium, as directed in the American Medical Isotopes Production Act. These efforts are critical for reducing our reliance on foreign sources for Moly-99.

NNSA has funded a handful of projects to date, one of which has supplied some Moly-99 to the market. NNSA is currently in negotiations to add two new projects. What are the metrics for success for both existing and new projects?

A5a. NNSA's metric for success is a reliable supply of Moly-99 in the United States produced without the use of Highly Enriched Uranium that includes sufficient reserve capacity to cover any unexpected outages.

Q5b. What is the cost estimate to complete the projects and what is NNSA's plan to ensure success?

A5b. The total project costs to bring the four new cooperative agreement technologies to market is currently estimated to be $849 million, most of which the cooperative agreement partners will provide.

NNSA will conduct regular project reviews to ensure adequate progress is being made in accordance with terms and conditions in the cooperative agreements and will evaluate project needs on an annual basis.

Q5c. The fiscal year 2020 budget request includes $10 million for the national laboratories to provide technical support, but no funding for cooperative agreements themselves. Does NNSA believe the laboratory support alone will ensure establishment of domestic production?

A5c. Ensuring the establishment of a reliable domestic supply of Mo-99 will require a combination of cooperative agreement funding, laboratory technical assistance funding, and significant private investment. Until the cooperative agreements are awarded and work scopes established, it is premature for NNSA to have a basis to request additional funds for the new cooperative agreements. NNSA will continue to monitor cooperative agreement progress and take that into consideration during the annual budgeting process.

QUESTION FROM REPRESENTATIVE KAPTUR

Site Governance

Q1a. It is the Committee's understanding that NNSA's Office of Safety, Infrastructure, and Operations is working to formalize the coordination required to take place between line management, functional elements, and field offices on matters concerning risk management, site activities, and operations.

What is the objective in formalizing required coordination?

A1a. NNSA is revising SD 226.1B, *NNSA Site Governance*. One key feature of the revision will be guidance to communicate potential mission risk impacts resulting from emergent safety, security, or operational events. This improved communication between field offices, functional managers, and program managers will help ensure all elements of NNSA management are operationally aware and facilitate making risk-informed decisions in response to such events.

Q1b. When does NA-50 anticipate completing the process to formalize this?

A1b. NNSA anticipates publishing the revision to SD 226.1B by October 30, 2019. NNSA expects to complete a formal review process by the end of the fiscal year. The review and subsequent approval process will ensure that all elements are fully aware of the proposed revision and can immediately implement it upon final approval.

Q1c. How will formalizing coordination help improve program-informed risk management, transparency, and communication across the enterprise?

A1c. NNSA expects the enhancements in the supplemental directive regarding communication of potentially significant issues to foster better coordination within the federal team and drive operational excellence in the mission. This approach will improve situational awareness, keep the leadership informed, and support the decision making process.

QUESTION FROM REPRESENTATIVE KAPTUR

Human Capital Management

Q2a. NNSA seeks funding to onboard an additional 63 Full Time Equivalents (FTEs) within a relatively short period of time to address additional work-scope. However, based on information provided to the Committee, the average time (in days) it takes to onboard a federal employee 5 years ago was 133 days compared to today when it takes 127 days.

Question: What specific steps is NNSA taking to appreciably reduce the amount of time it takes to onboard federal employees and streamline human capital processes?

A2a. NNSA is maximizing the use of Excepted Service hiring authorities to reduce the amount of time to onboard employees. In January and July 2019, recruiting events were held in which Human Resources expedited the hiring process by accepting resumes, conducting interviews, checking references, performing required drug tests, initiating fitness for duty and security clearances and extending fifty-three job offers in a single day. This resulted in NNSA surpassing the target hiring goal of 1,690 personnel.

Q2b. What programs will receive the additional 63 FTEs that NNSA is requesting and is it based on risk and workload?

A2b. Defense Programs will receive the additional 63 FTEs based on mission growth and risk determination. This includes increases in their offices of Life Extension Programs, Strategic Materials, Stockpile Sustainment, and Research, Development, Test, and Evaluation. In FY 2018, two independent studies concluded that the NNSA had unmet critical staffing needs. The Office of Personnel Management (OPM) and NNSA's Office of Cost Estimating and Program Evaluation (CEPE) separately arrived at the conclusion that the NNSA is currently understaffed. Both studies recommended that the NNSA should hire additional staff and exceed its current statutory cap of 1,690 full-time

equivalent (FTE) employees. In March 2019, the Government Accountability Office (GAO) also endorsed OPM and CEPE's conclusion that there are critical staffing shortfalls across multiple NNSA functions. NNSA will authorize an additional 63 FTEs in Defense Programs in FY 2020 based on the Weapons Activities account mission growth and risk assessment.

Q2c. Is NNSA considering the use of a "matrix-management" approach that includes human capital, acquisition, and project management expertise to program offices in order to improve performance and transparency?

A2c. Through a Staffing Plan Review process, NNSA is identifying opportunities to streamline operations and make full use of matrix management, to include human resources, the planning, programming, budgeting, and evaluation process, learning and development, acquisition, and project management to improve performance, eliminate redundancy, and streamline resources.

QUESTION FROM REPRESENTATIVE KAPTUR

Production Planning and Execution

Q3. NNSA's operational tempo has and continues to grow due to additional requirements. The nuclear security enterprise—its infrastructure, workforce, and operations—will be challenged to meet production, schedule, and cost commitments.

How is NNSA improving coordination and transparency within the enterprise to meet the strategic direction of NNSA's weapons and nonproliferation programs in a cost-effective, timely, and safe manner?

A3. On May 6, 2019 NNSA released its Strategic Vision, Governance & Management Framework, and Strategic Integrated Roadmap to guide efforts across the nuclear security enterprise.

NNSA's Strategic Vision ("Vision") identifies mission priorities and goals to ensure the agency is responsive to the Nation's nuclear security and strategic defense needs. It also outlines key expectations for the governance and management of the nuclear security enterprise along with a set of core values and behaviors that will help NNSA meet its missions on budget and on schedule.

NNSA's Governance and Management Framework ("Framework") focuses on the "One NNSA" team approach to mission integration and strategic planning and establishes clear roles and responsibilities across the enterprise. The Framework encompasses the federal headquarters and field office staff, as well as the Management and Operating contractors at NNSA's eight laboratories, plants, and sites. Its goal is to show how the NNSA will deliver its mission in a resilient, agile, and responsive manner.

Finally, NNSA's Strategic Integrated Road Map illustrates the path to achieving goals now and into the future. NNSA's mission priorities include maintaining the stockpile; countering and reducing proliferation threats; providing the Navy with safe, militarily-effective naval nuclear propulsion plants; applying world-class scientific and technological discoveries to real-world problems; and modernizing the infrastructure of the enterprise.

The release of these three documents along with the planned communications and outreach on these documents is intended to improve coordination and transparency across the nuclear security enterprise. Additionally, improved mission integration and transparency are key themes in both the Framework and the Vision. These documents are intended to demonstrate collectively what the mission priorities are and how NNSA will work together as one team to ensure NNSA will meet its missions safely, on time, and on budget.

QUESTION FROM REPRESENTATIVE KAPTUR

Partnerships and Collaboration

Q4a. NNSA has highlighted the importance of establishing training and development pipelines for manufacturing and capabilities such as precision machining, flexible circuitry, advanced manufacturing, engineering expertise, and skilled labor expertise (i.e. welding, nuclear operators, boilermakers, etc.).

While NNSA has fostered important and necessary pipelines and collaborative initiatives with local communities and institutions located nearest to its sites and laboratories, what opportunities exist to leverage engineering and skilled labor expertise outside the immediate surrounding regions of NNSA's labs and plants?

A4a. Over the past several months, NNSA has broadened the aperture of recruitment and retention outreach across the NNSA nuclear security enterprise (NNSA NSE – comprised of NNSA, as well as the Management & Operations (M&O) contractors, who run the laboratories, sites, and plants). A formal NNSA NSE recruitment strategic framework was developed. The NNSA NSE recruiting events we held in the last four months included all of the M&Os as well as the NNSA federal hiring authorities. By appearing together, as an enterprise, at Georgia Tech, Texas A&M, Purdue University, and University of California at Merced, we shared resources and helped each other find the talented employees we need. Our upcoming NNSA NSE day recruiting event in Ohio this fall will include a special focus on community colleges and vocational schools. Efforts have concentrated on academic institutions with renowned Science, Technology, Engineering, and Mathematics (STEM) focus as well as, Minority Servicing Institutions (MSIs - Historically Black Colleges and Universities, Hispanic Servicing Institutions, and Tribal Colleges and Universities). NNSA's Minority Servicing Institution Partnership Program (a partnership with about 50 MSIs across the Nation) and NNSA's Graduate Fellowship Program (outreach with over 150 academic institutions worldwide) are two

programs that facilitate NNSA's work in this area. In addition, NNSA is embarking on efforts to foster robust partnerships with trade schools and other skilled labor forums to leverage those crucial talents needed to sustain the mission.

Q4b. Is there value in assessing the potential of establishing a cooperative education pilot-program focusing on key capabilities including, but not limited to, manufacturing, materials science, engineering, tooling, and machining?

A4b. NNSA is a full partner in the Federal Government's STEM Education strategic plan, signed by the White House in December 2018. Ongoing initiatives that NNSA will continue to expand include internships and fellowships, which provide students with immersive work addressing real-world projects and challenges. Within the Minority Servicing Institution Partnership Program, for example, programs focus on advanced manufacturing, cyber security, high energy density science, and engineering. NNSA's increased focus on nuclear security enterprise-wide academic affiliations (including trade schools and community colleges) will enable the continued exploration and advancement of cooperative education pilot programs.

QUESTION FROM REPRESENTATIVE SIMPSON

NNSA and DoD are looking at collaborating to develop a "full spectrum" test and training range to improve training for emergency responders and the diverse set of capabilities at INL is being evaluated.

Q1. Deputy Administrator Park, preparing our Nation's emergency responders is an important responsibility for NNSA, one that it is uniquely able to perform utilizing the DOE national laboratories. I understand there is a need for exercising the full scope of tactics, techniques, and procedures to achieve the highest level of preparedness (train the way you fight). This requires capabilities not found many places (large open spaces, nuclear and radiological materials, classified operations, use of destructive tools). What is NNSA doing to advance the preparedness of our emergency responders and how can INL help?

A1. DOE fully agrees that there is a need to exercise the full scope of DOE's and our federal partners' tactics, techniques, and procedures to continually improve our effectiveness in realistic environments and operational conditions. The NNSA Office of Counterterrorism and Counterproliferation is responsible for targeted nuclear and radiological incident response training both domestically and internationally.

DOE's sites, including the Idaho National Laboratory, are harnessed to exercise and evaluate our domestic and international incident response capabilities. DOE/NNSA stands ready to support our interagency partners to continue preparing first responders.

QUESTION FROM REPRESENTATIVE SIMPSON

Naval Reactor Research

Q2. Admiral Caldwell, as you look to recapitalize your programs research and development capabilities, to what extent will you look at assets at our national labs to leverage existing and future investments and reduce shipping costs in some cases?

A2. Naval Reactors' research and development efforts support today's fleet and ensure our Navy maintains its technological advantage over adversaries. These activities are critical as the Navy analyzes requirements for future classes of ships. Investments today in research and development efforts advance capabilities and build cost savings into future work efforts.

Naval Reactors continues to place a strong emphasis on maintaining and recapitalizing our research and development capabilities. As we have done throughout the history of the program, we will assess existing and planned capabilities across the national laboratories and leverage them, when appropriate, to support Naval Reactors research needs and reduce lifecycle costs. For example, Naval Reactors collaborates with the Department of Energy's Office of Nuclear Energy to utilize the Materials and Fuels Complex on the Idaho National Laboratory in lieu of developing these capabilities in-house.

QUESTION FROM REPRESENTATIVE VISCLOSKY

Rising Costs and Competing Priorities

Q1a. There remain serious concerns regarding the long-term fiscal viability of the current nuclear-modernization program as well as NNSA's ability to assess cost tradeoffs among competing priorities. A recent report by the Congressional Budget Office (CBO) projected that U.S. nuclear forces would cost $494 billion over the 2019–2028 period. This estimate is $94 billion more than a CBO estimate published in 2017, and a substantial portion of this increase is related to new modernization programs proposed by the Administration in its 2018 Nuclear Posture Review (NPR). Meanwhile, the annual budget request for Defense Nuclear Nonproliferation (DNN) programs has declined in three out of the last four fiscal years.

What steps is NNSA taking to ensure the overall affordability and executability of the nuclear-modernization program proposed in the 2018 NPR?

A1a. NNSA evaluates affordability as part of a portfolio management approach, in line with the level of uncertainty affecting the estimates for out-years beyond the President's Budget Request. This is analyzed by comparing an aggregate portfolio of cost estimates to a reasonably projected topline budget. Variances are managed as the out-years estimates move into the Future Years Nuclear Security Program (FYNSP) window, and greater scrutiny and prioritization are applied as part of the programming and budgeting processes.

Q1b. How does NNSA assess cost tradeoffs among competing priorities, including nuclear modernization, stockpile stewardship, nuclear nonproliferation, and infrastructure recapitalization?

A1b. A fiscal year funding request is the result of a year-long, documented planning, programming, budgeting, and evaluation process underpinned with validated requirements. Tradeoffs carefully consider national security policy and ongoing programmatic deliverables designated by the Administration, proposed funding growth

between fiscal years, complex-wide strategic plans, and executability informed by science-based metrics such as mission risk reduction, life cycle spend plans, site allocations, and the evaluation of current year performance against planned milestones.

Q1c. Are there instances in which spending on any aspect of the nuclear-modernization program has resulted in fewer funds requested for stockpile-stewardship or nuclear-nonproliferation programs? If so, what are some specific examples?

A1c. NNSA seeks to balance investments across its portfolio of activities each year in alignment with national security goals, NNSA's strategic vision, and deliverables. Our spending on nuclear modernization has not negatively impacted our spending requests for stockpile stewardship or nuclear nonproliferation programs.

In cases where funding requests for stockpile stewardship or nonproliferation activities in a given fiscal year have been reduced, these changes were made based on the anticipated ability of program resources to execute. This might be because program goals have concluded or a lack of success or opportunity on speculative initiatives. For example, the FY2020 Budget Request for some stockpile-stewardship and nuclear-nonproliferation programs reflected reductions in recent years due to increased uncosted balances. As these balances are expended, appropriate amounts of budget authority will be requested in following years.

QUESTION FROM REPRESENTATIVE VISCLOSKY

W76-2 Warhead

Q2a. In discussing the low-yield warhead for submarine-launched ballistic missiles and other "non-strategic" capabilities, the 2018 NPR states that Russia "believes that the United States is unwilling to respond to Russian employment of tactical nuclear weapons with strategic nuclear weapons" and that it "mistakenly assesses that the threat of nuclear escalation or actual first use of nuclear weapons would serve to 'de-escalate' a conflict on terms favorable to Russia." Yet, experts have disputed Russian interest in limited nuclear first use and raised concerns about escalation dangers inherent in low-yield capabilities.

What publicly available sources support the 2018 NPR's assertions regarding Russian nuclear doctrine?

A2a. The Department of Energy defers to the lead agencies, the Department of Defense and Department of State, on the policy analysis and national security requirements identified in the 2018 Nuclear Posture Review.

Q2b. Do treaty allies in Europe concur with the 2018 NPR's assessment regarding Russian nuclear doctrine?

A2a. The Department of Energy defers to the lead agencies, the Department of Defense and the Department of State, on the policy analysis and national security requirements identified in the 2018 Nuclear Posture Review.

Q2c. Prior to detonation, how would Russia discriminate between a high- and low-yield warhead launched on a Trident-II missile from an Ohio-class submarine, and why would Russia wait to find out whether it was being targeted with a high- or low-yield warhead before priming its strategic nuclear forces for use?

A2a. The Department of Energy defers to the lead agency, the Department of Defense, on issues related to foreign state military capabilities and calculus.

QUESTION FROM REPRESENTATIVE VISCLOSKY

Low-Yield SLCM

Q3a. The 2018 NPR states that "Expanding flexible U.S. nuclear options now, to include low-yield options, is important for the preservation of credible deterrence against regional aggression." The pursuit of additional "low-yield options" is questionable, both from the perspectives of cost and strategy. Nevertheless, the Administration's budget request for FY 2020 persists in this pursuit by including $7 million to study the development of a low-yield SLCM. The CBO's most recent estimate of the 10-year costs of U.S. nuclear forces found that this new capability would be far more expensive than this initial request suggests. According to the CBO's estimate, the low-yield SLCM's development could cost taxpayers $9 billion over the next ten years.

What is the military requirement for the low-yield SLCM that cannot be fulfilled by a low-yield warhead in the current U.S. nuclear arsenal or planned capabilities, including the B-21 Raider or the Long-Range Stand-Off (LRSO) weapon?

A3a. The Department of Energy defers to the lead agency, the Department of Defense, on military requirements.

Q3b. Recognizing the rising costs of the nuclear-modernization program, would the low-yield SLCM utilize the design of the LRSO, as the CBO suggests, and would it use an existing warhead, a modified warhead, or a new warhead?

A3b. The U.S. Navy is developing an Analysis of Alternatives for the Sea Launched Cruise Missile (SLCM) system. DOE/NNSA and the Department of Defense (DoD) will not make any decisions on a SLCM warhead until the study is completed and the requirements are validated by the Nuclear Weapons Council (NWC). When the NWC authorizes NNSA to begin consideration of a new warhead, all options will be considered to meet DoD requirements.

Q3c. Do treaty allies in Europe support the development and deployment of the low-yield SLCM to deal with contingencies in their region?

A3c. The Department of Energy defers to the lead agencies, the Department of Defense and Department of State, on the policy analysis and international engagement related to treaty ally support of the proposed development and deployment of weapons.

QUESTION FROM REPRESENTATIVE VISCLOSKY

Sexual Assault

Q4a. On January 25, 2019, the New York Times published a troubling account of a female security guard's experience of sexual harassment at the Nevada National Security Site. The security guard, Jennifer Glover, also claims to have been the victim of a sexual assault in November 2017. According to news reports, DOE security contractors dismissed Ms. Glover's allegations, and even retaliated against her for reporting them. It is critical that DOE ensure the entire nuclear-security enterprise is free of sexual harassment and assault. Such behavior is deleterious to victims, DOE recruitment and retention efforts, and, ultimately, the ability of the United States to maintain a safe, secure, and effective nuclear deterrent.

What activities, including management and oversight practices, does DOE undertake to ensure that security contractors foster workplaces free of sexual harassment and assault?

A4a. Our Nation depends on us to accomplish national security missions each and every day, so it is imperative that all employees feel safe on the job. At every one of the Department's sites, there are resources available to a victim of any type of misconduct. Supervisors and managers routinely encourage employees to immediately seek help in the event of assault, harassment, or reprisal. Contractor employees are provided avenues to bring concerns directly to the Department if they choose to do so. Additionally, contractors are required to address allegations of inappropriate behavior with a timely, thorough investigation and hold each employee accountable as necessary.

Contractors are required to adhere to their contract terms and award terms, respectively, along with all applicable law. DOE/NNSA requires employers to take all necessary steps to prevent sexual harassment from occurring, informing employees of their rights, and developing methods to sensitize all concerned (29 C.F.R. 1604.11(f)). Also, E.O. 11246 and its regulations at 41 CFR chapter 60 contain legally mandated requirements for

contractor employers related to sexual harassment. Specific protections include, EO 11246, Section 202(1); 41 CFR 60-1.4(a)(1): “The contractor will not discriminate against any employee or applicant for employment because of … sex [and]… will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their … sex….”

41 CFR 60-1.32: “The contractor… shall not harass, intimidate, threaten, coerce, or discriminate against any individual because the individual has engaged in [protected activities]. The contractor… shall ensure that all persons under its control do not engage in such harassment, intimidation, threats, coercion or discrimination.”

41 CFR 60-20.8(a): “Harassment on the basis of sex is a violation of Executive Order 11246, as amended.” The rest of this subsection goes on to describe specific actions that are unlawful.

For contractors working on-site, they must have an approved Worker Safety and Health Program, that outlines processes and procedures for employees related to safety. Additionally, all Department of Energy federal employees are required to participate in a minimum of 3 hours of training on the prevention of sexual harassment on a biennial basis per DOE Order 311.1B.

For any contract administration issue, the contractor is responsible for taking corrective action, if deemed necessary. Failure to correct could result in a Cure Notice (proscribed

in FAR 52.249-8, included in all DOE contracts) being issued to the contractor and possible termination.

Q4b. Are there mechanisms for security-contractor employees to report incidents of sexual harassment or assault to DOE, and for DOE to hold contractors accountable should they fail to take appropriate remedial action?

A4b. Contractor employees are able to report observed or experienced sexual harassment or assault through the Department of Energy (DOE) Employee Concerns Program (ECP). DOE's ECP ensures employee concerns related to such issues as the environment, safety, health, and management of DOE and the National Nuclear Security Administration (NNSA) programs and facilities are addressed through:

- Prompt identification, reporting, and resolution of employee concerns regarding DOE facilities or operations in a manner that provides the highest degree of safe operations;
- Free and open expression of employee concerns that results in an independent, objective evaluation; and
- Supplementation of existing processes with an independent avenue for reporting concerns.

In addition to the ECP managers providing assistance in the evaluation and resolution of employee concerns, they will also transfer concerns to other programs or processes if the concern is deemed to be outside the scope of the ECP (such as Equal Employment Opportunity) along with documenting that an individual, office, or organization has

accepted responsibility for minimizing, correcting, and preventing recurrence of concerns that have been substantiated through the ECP process.

Additionally, the Office of Inspector General (OIG) maintains a hotline to facilitate the reporting of allegations of fraud, waste, abuse, or mismanagement in U.S. Department of Energy (DOE) programs or operations. This includes violations of federal laws and regulations.

For any contract administration issue, the contractor is responsible for taking corrective action, if deemed necessary. Failure to correct could result in a Cure Notice being issued to the contractor and possible termination.

Q4c. Does DOE collect data on reported incidents of sexual harassment and assault among its security contractors?

A4c. There are numerous reporting requirements for the contractor in the event of alleged violence, discrimination, or other criminal activities, such as NNS-H-1017 VIOLENCE IN THE WORKPLACE (NOV 2009), a contract clause which states Contractor supervisors or management representatives shall report any incident or threat of aggression, harassment, hostility, intimidation, or violence to the Contracting Officer or the COR.

In the event of the contractor's non-compliance with the nondiscrimination clauses of this contract, or with any such rules, regulations, or orders, this contract may be canceled,

terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts.

QUESTION FROM REPRESENTATIVE POCAN

Medical Isotopes Production

Q1. Pursuant to the American Medical Isotopes Production Act (Section 3174), the Department of Energy, by January 1, 2020, is required to notify Congress whether exports of HEU for fabricating Moly-99 will be permitted after January 1, 2020. As you know, one of the principle purposes of AMIPA is to curb the export of HEU because of its nuclear proliferation implications and dangers.

Could you describe for the Committee what process the Department will use to make this determination? Has a process been established and if so, what is it, or if has not been established, what is the Department's plan to establish it? This question is not what the Department's decision will be, but solely a question about the process for coming to a decision.

A1. Per American Medical Isotopes Production Act, DOE/NNSA, in conjunction with Health and Human Services (HHS), is reviewing the global market supply to certify that there is either a sufficient or insufficient supply of Moly-99 and other medical isotopes produced without the use of highly enriched uranium available to satisfy the domestic United States market. DOE/NNSA will take into consideration any impacts its decision might have on disrupting global supplies of medical isotopes. Based on this review, the Secretaries of DOE and HHS will make the appropriate certifications.

QUESTION FROM CHAIRMAN JIM COOPER

Plutonium Pit Production

Q6. The MOX facility cancellation and subsequent repurposing for plutonium pit production has been done without a competitive bid process. The President's Budget requests $410 million for plutonium activities at the Savannah River site. This request includes design activity and a plan for a Critical Decision (CD)-1 in FY 2020 for the plutonium pit production facility. Given the lifecycle costs that DOE has identified for plutonium pit production at Savannah River (at least $14 billion), and the complexity in repurposing a facility designed for a different purpose, how can the NNSA assure Congress and the taxpayer that design and subsequent construction will be done properly, in a cost-effective manner without a competitive bid process? Why hasn't NNSA allowed for competitive bidding process for the design of this facility? Does NNSA plan to consider competitively bidding this project at any point? If so, when?

A6. NNSA utilized the current Savannah River Nuclear Solutions contract for the conceptual design that is underway. This conceptual design effort is within the scope of the existing contract. The lifecycle costs were estimated in the Engineering Assessment Report to support the Analysis of Alternatives for comparison purposes only. A lifecycle estimate and an Acquisition Strategy are required by DOE O 413.3B (Program and Project Management for the Acquisition of Capital Assets) at Critical Decision-1. NNSA will develop this Acquisition Strategy to detail procurement plans for the remainder of the project. Further, NNSA is required to follow DOE O 413.3B which defines management for a DOE nuclear project and provides a set of requirements to provide maximum confidence for the proper execution of a project.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Nuclear Deterrence

Q1. During your testimony, when asked what the next level, above "low-level," of nuclear attack would be, you stated "deterrence." Can you clarify what you meant in drawing a distinction between "low-level nuclear attack" and "deterrence"? Are you suggesting deterrence only exists above a certain threshold of "nuclear attack?"

A1. Given the complexities of today's evolving security environment, nuclear deterrence is more important now than at any time since the end of the Cold War. Any potential nuclear attack against the United States and its allies is the most serious threat to our national security and is unacceptable. Low-yield nuclear weapons bolster deterrence by signaling to potential adversaries that there is no possible advantage in limited nuclear weapon use against the United States. This does not lower our threshold for nuclear weapons use, but rather raises it for our adversaries. Maintaining diversity in weapon platforms' range and survivability is prudent to sustaining a tailored deterrence approach.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Q2. In your testimony before the Committee, you noted: “In terms of the escalate to deescalate, that's where the--an adversary, perhaps, attacks us and doesn't think that we have a capability to attack on a lower level, if you will, or with low-yield inclined nuclear weapons. But that is not a scenario that we envision.” If this is not an envisioned scenario, why did the NNSA develop the W76-2 warhead? Why is there a need to place low-yield nuclear weapons on the Ohio-class submarine force for the first time in the strategic submarine force’s history?

A2. In an era of renewed peer competition, the Department of Defense has identified the W76-2 as important to prudently sustain our nuclear deterrent capabilities by providing additional diversity in weapon platforms’ range and survivability. The W76-2 is not a new nuclear weapon. It is a modification of the W76 warhead using existing components and will utilize the same delivery platform as the W76, a Trident II D5 missile.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Q3. Do you see risks in increasing the likelihood of nuclear use by an adversary by drawing distinctions in levels of "nuclear attack"? Would it not be more prudent for our national security to make clear the United States does not consider any nuclear use "low-level"?

A3. Any potential nuclear attack against the United States and its allies is the most serious threat to our national security and is unacceptable. The majority of weapons in today's stockpile have surpassed their intended design life, thereby accumulating increasing risk. The United States has reduced its stockpile by 25 percent since 2010, while potential adversaries have increased their numbers of nuclear weapons and significantly modernized their nuclear capabilities. The U.S. nuclear deterrent has been the cornerstone of our national security and global stability for more than 70 years, and its credibility serves as the ultimate insurance policy against a nuclear attack. Increasing the flexibility of the deterrent by providing additional options serves to increase our adversaries' nuclear thresholds. For more detail on questions about nuclear policy, NNSA defers to the Department of Defense.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Life Extension Programs

Q4. Given the information you currently have with respect ongoing life extension programs such as the B61 or W88, are you expecting any delays in First Production Units?

A4. Currently in Phase 6.4, Production Engineering, the B61-12 Life Extension Program (LEP) has demonstrated system performance in over 60 integrated ground and flight tests, including eight joint flight test drops. NNSA notified your committee of a technical issue with the B61-12 LEP that we estimate will delay the First Production Unit (FPU). NNSA is aggressively working to minimize the delay and are working with the Department of Defense to coordinate any possible impacts.

The W88 Alt 370 is currently in Phase 6.4, Production Engineering. NNSA is aggressively managing the FPU for this program, which was scheduled for December 2019. NNSA also notified your committee that the same technical issue impacting the B61-12 LEP will impact the W88 Alteration 370. The delay to FPU is still being assessed and a number of mitigation plans are being executed at this time, in coordination with the Department of Defense, to minimize schedule impacts to FPU.

The remaining three weapons modernization programs (the W76-2 Modification Program, the W80-4 LEP, and the W87-1 Modification Program) remain on schedule and on budget.

QUESTION FROM REPRESENTATIVE JOHN GARAMENDI

Defense Nuclear Facilities Safety Board

Q8. Given the cancellation of the MOX facility and the plan to repurpose the facility, what role do you envision for the Defense Nuclear Facilities Safety Board throughout design, construction, and operation? What is the plan and timeline for DNFSB oversight?

A8. The DNFSB provides analysis, advice, and recommendations to the Secretary of Energy in order to assist the Department in providing adequate protection of the public health and safety at DOE's defense nuclear facilities. The Board's advisory functions under the Atomic Energy Act of 1954 (AEA), as amended, include review of the design of new Department of Energy defense nuclear facilities before construction begins and periodic review and monitoring of the construction as it progresses. DOE/NNSA anticipates timely engagement with the DNFSB, as governed by the AEA and DOE/NNSA directives, to strengthen early integration of safety-in-design and reduce project schedule risks by identifying and addressing nuclear safety issues as early as possible.

QUESTION FROM REPRESENTATIVE JOHN GARAMENDI

Plutonium Pit Production

Q9. Does NNSA anticipate conducting a Programmatic Environmental Impact Statement (PEIS) pursuant to the National Environmental Policy Act on its plan to expand plutonium pit production at two sites? If so, when does it plan to begin this process?

A9. Thorough evaluations of potential environmental impacts associated with any proposal to produce plutonium pit at two sites will be conducted in accordance with the National Environmental Policy Act. NNSA notes that compliance with the National Environmental Policy Act is built into our acquisition process and we will implement an environmental compliance strategy.

QUESTION FROM CHAIRMAN JIM COOPER

Q8. You noted in your testimony that NNSA is working to identify design simplifications in future warhead programs that may have on the order of $1 billion dollars in cost savings. Had the delays in the B61-12 and the W88 not occurred, would these design simplifications in the W80-4 and the W87-1 still have been pursued by NNSA? What are the specific design simplifications that will save $1 billion? Are the future modifications, alterations, and LEPs overfunded if $1 billion can so easily be found within them? When will NNSA formally provide Congress with this updated cost information?

A8. NNSA will attempt to balance the funding across all on-going weapon modernization activities to address B61-12 LEP and W88 Alt 370 funding needs. This approach will be challenging. NNSA is working to do this by utilizing remaining contingency and management reserve within the B61-12 LEP and W88 Alt 370 programs, and by applying lessons learned from these programs to reevaluate other on-going warhead activities for the potential of cost avoidance. The W80-4 LEP is already in Phase 6.3 so NNSA is looking at design/component simplification. The W87-1 Modification Program is in Phase 6.2 so NNSA, in coordination with the Department of Defense, is exploring both scope reductions (a normal part of the process in Phase 6.2) and design simplifications. Since no additional funding is required for the B61-12 LEP and W88 Alt 370 in Fiscal Year (FY) 2020, NNSA is working to understand our ability to carry out this approach in time for FY 2021 funding discussions.

QUESTION FROM CHAIRMAN JIM COOPER

Q9. How will NNSA determine the extent to which the programs have sufficient contingency, given it is clear that neither the B61-12 nor W88 ALT 370 had sufficient contingency?

A9. NNSA provided contingency for both of these two programs at the start of each of their respective Phase 6.3 based on DOE/NNSA policy as informed by the DOE Office of Project Management and Oversight Assessment and Government Accountability Office best practice standards. As with any program of this complexity, contingency is utilized through the life of the program to address both previously assessed risks and unplanned realized risks.

The W80-4 Weapons Design Cost Report (WDCR) is very comprehensive, includes federal contingency, and is in close agreement with the Office of Cost Estimating and Program Evaluation's (CEPE) Independent Cost Estimate (ICE). While the program includes an estimate of contingency, CEPE's ICE utilizes historical actual data where contingency has been realized in principle. The W87-1 WDCR will follow the same comprehensive estimating process and, in accordance with NNSA's policies, will be reconciled with CEPE's independent estimate.

QUESTION FROM CHAIRMAN JIM COOPER

Q10. You noted in your testimony that some organizational improvements have been identified as a result of the delays. Please specify, in detail, the identified improvements and a timeline for implementation.

A10. In October 2019, NNSA's Office of Defense Programs instituted a reorganization and realignment to account for the increased workload of future LEPs and to adjust for the W88 ALT 370 and B61-12 LEP schedule slips. To meet these challenges, this reorganization:

- Consolidates and manages all legacy and future weapons efforts under a single office;
- Realigns strategic materials and component production modernization efforts;
- Increases focus on production and integration of production efforts across the enterprise;
- Aligns technology maturation initiatives with research, development, test, and evaluation efforts under a single office.

Organizational changes are also being made at the relevant Management and Operating (M&O) contractors' sites. The federal program management team is being augmented with the addition of federally-led Integrated Product Teams focused on improving coordination and communications, both between the numerous M&O-led Product Realization Teams and up to federal program leadership. The M&O organizational changes are the responsibility of the individual sites, but are informed by the lessons uncovered by the NNSA review teams.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Q1. Dr. Verdon: Numerous reviews and assessments have been and are being conducted on NNSA's governance model. Recent reviews have noted the lack of clarity in roles and responsibilities within the enterprise, considering the cost and schedule delays of the B61-12 and the W88 ALT 370 programs, does NNSA plan to evaluate how to improve and clarify the roles and responsibilities within the enterprise? If NNSA is not planning to evaluate how to make improvements to these areas, please explain why in detail.

A1. In May 2019, NNSA released three strategic documents, which serve as the guiding principles for how NNSA does business. Collectively, these three documents, *Strategic Vision*, *Strategic Integrated Roadmap*, and *Governance and Management Framework,* set the stage for realizing the cultural changes necessary to ensure that NNSA continues to demonstrate excellence and is responsive to the nation's nuclear security and strategic defense needs now and into the future. These documents set the expectation that NNSA execute its mission based on clearly defined roles, responsibilities, authorities, and accountability, and work with single purpose through more effective teaming and improved mission integration. Clearly defined roles and responsibilities coupled with effective integration of operations drive collaboration, teamwork, communication, and efficiency across the nuclear security enterprise, resulting in peak performance and mission execution.

With respect to the B61-12 and W88 Alt 370, NNSA's Office of Defense Programs formed two teams to examine and document root causes and lessons from these delays. These teams determined that clarity regarding roles and responsibilities between the organizations involved was not a major factor. The respective organizations already had and continue to have an understanding of their roles and responsibilities. The teams

identified that a more important contributing factor was how those roles and responsibilities were being executed, as well as the integration between the respective sites, Management and Operating (M&O) contractors, and federal program managers. NNSA is working with our M&Os to improve this integration.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Q2. Dr. Verdon: the NNSA Act provides the Deputy Administrator with specific authority for "directing, managing, and overseeing the nuclear weapons production facilities and the national security laboratories." However, the field offices and many other critical support functions such as infrastructure, operations, and acquisition—which are necessary for delivering programs within their original performance baseline—reside outside of the Deputy Administrator's organizational purview.

Please specify, in detail, how you ensure each of the following mission support functions are integrated to meet the strategic direction of the Deputy Administrator: Field Offices; Infrastructure, Operations, and Safety, and Health; Acquisition and Project Management. Have any of the planned organizational and program changes, brought on by the delays, been formally approved by the Administrator?

A2. For major activities such as warhead modernization programs, NNSA works to ensure integration through both documented plans and frequent "face-to-face" meetings. This provides each relevant organization the information they need to enable the success of the program in question. The documented plans (and any changes to the plans) are coordinated between all relevant NNSA organizations and M&O contractors. Face-to-face meetings occur at all levels and frequency depending on need. For example, sites hold daily meetings to ensure workforce understanding of the activities planned for that day at that site. Leadership of the sites and Federal Managers hold weekly meetings at minimum to ensure that all sites understand what is ongoing and planned, and to ensure dependencies between each site are addressed. Quarterly, there is a day-long in-depth review of each project to provide further communication between all involved. Organizational changes are being made at the M&O partner sites, while the federal program management team is also being augmented with the addition of federally-led Integrated Product Teams. These teams are focused on improving coordination and

communications between the numerous M&O lead Product Realization Teams and federal program leadership.

QUESTION FROM REPRESENTATIVE SUSAN DAVIS

Q3. Dr. Verdon: What, if any, modifications need to occur with respect to how NNSA manages technology and manufacturing maturing and readiness in light of the delays?

A3. One of the key lessons NNSA has learned from our review of the delays is the need to modify our manufacturing and technology readiness. NNSA is putting into place a number of changes to minimize the chance of recurrence of the issue encountered with these two programs in the future. For example, three changes being implemented are:

1) NNSA has consolidated all technology and manufacturing readiness/maturations efforts (TRLs and MRLs), outside of specific weapons program modernization activities, under one program office. These activities had previously been distributed among a number of organizations. This consolidation enables a more strategic and integrated approach.

2) For any new technology and/or components proposed for use in a warhead modernization activity, NNSA has moved the assessment that decides if the use of new technology will be supported to earlier in the 6.X process, prior to entering Phase 6.2. We have also increased the level of assessment needed. Of course, NNSA recognizes that in some cases a new technology might offer some significant potential benefits, and on a case-by-case basis the use of new technology will be supported, but risk mitigations must be identified and pursued in parallel.

3) NNSA has implemented more rigorous and frequent independent assessments of technology and manufacturing readiness levels to assess the progress of key components and to provide an additional indicator as to whether TRLs or MRLs are falling behind their needed dates for use, so that corrective actions can be taken in a timely manner.

QUESTION FROM REPRESENTATIVE RICK LARSEN

Q4. If NNSA plans to shift contingency from the W80-4 and W87-1 to the B61-12/W88 Alt 370, will this shift be commensurate with the planned simplifications of these programs designs? What are the current contingency amounts for the W80-4 and the W87-1?

A4. NNSA will attempt to balance the funding across all on-going weapon modernization activities to address B61-12 LEP and W88 Alt 370 funding needs. This will not be done by shifting contingency from the W80-4 LEP or W87-1 Modification Program. NNSA plans to do this by utilizing contingency and management reserve within the B61-12 LEP and W88 Alt 370 and by applying lessons from both to reevaluate other ongoing warhead activities for the potential of cost avoidance through design/component simplifications and scope reductions. The W80-4 LEP is already in Phase 6.3; therefore, NNSA is looking at design/component simplification for that program. The W87-1 Modification Program is in Phase 6.2, so NNSA, in coordination with the Department of Defense, is exploring both design simplifications and scope reductions— a normal part of Phase 6.2. Since no additional funding is needed for the B61-12 LEP and W88 Alt 370 in Fiscal Year (FY) 2020, NNSA intends to have additional details on the potential cost avoidance that can be identified in the W80-4 LEP and W87-1 Modification Program in time to inform FY 2021 budget/funding discussions.

The FY 2020 contingency for the W80-4 is $20 million, which is 2.2% of the FY 2020 budget. The W87-1 is in early development stage and has not established a baseline. Therefore, no contingency reserve is allocated.

QUESTION FROM REPRESENTATIVE RICK LARSEN

Q5. Within the NNSA enterprise, who is responsible for deciding when specific tests, such as the tests that identified the issues causing delays, are done on warhead components?

A5. It is the responsibility of the design laboratory of the component in question working with the relevant production site to identify what and when tests are needed to provide the underpinning evidence that components meet requirements.

QUESTION FROM REPRESENTATIVE RICK LARSEN

Q6. When were you and the Administrator made aware of potential issues with the capacitors?

A6. The technical issue with the parts in question was confirmed in April 2019, but the full extent and impact was still under investigation at that time. In June 2019, the full extent, path forward to fix, and potential impacts to the B61-12 LEP and W88 Alt 370 delivery timelines were identified.

In 2014, the components in question were identified for use in both systems. Between 2014 and 2018, testing of the components did not show failures. However, in December 2018, NNSA was informed of the first reported failure of one of the capacitors in question. The initial failure occurred in December 2018 under extended life testing by a testing vendor utilized by the Kanas City National Security Campus. Between February 2019 and April 2019, Sandia National Laboratories repeated those tests, confirming the failure, and conducted numerous other tests to understand the extent of the issues. The full extent of the issues, the path forward to fix the issues, and the potential impacts to warhead delivery timelines were not established until June 2019.

The Administrator and I were formally notified in April 2019 that the Sandia testing verified the single failure seen previously. We were again formally notified in June 2019 as to the extent, the path forward to address the issues found, and the resulting delays to the two programs. NNSA personnel, along with personnel from the Air Force and Navy were involved throughout the process.

In May 2019, NNSA notified Congress that technical issues were encountered on the B61-12 LEP and the W88 Alt 370 that could result in delays, but the full extent was not known at that time. Since then, in August 2019, NNSA provided an update to Congress as information became available regarding First Production Unit dates, resulting warhead delivery dates, and a first estimate as to the cost impacts due to these delays. NNSA will continue to provide updates to Congress during quarterly program reviews of these programs.

QUESTION FROM REPRESENTATIVE JOHN GARAMENDI

Q11. Are the Navy and NNSA considering a new warhead design for the Next Navy Warhead?

A11. The detailed requirements for a Next Navy Warhead are still in development within the Department of Defense. It is too early in the process to provide any details regarding what type of warhead will be required to meet U.S. Strategic Command and U.S. Navy needs.

QUESTION FROM REPRESENTATIVE JOHN GARAMENDI

Q12. NNSA has identified a need to hire additional FTEs with federal program management expertise in the Office of Defense Programs and in other critical mission support areas. Please specify how NNSA is making full use of its current Excepted Service authorities to hire additional Federal program management expertise. Would additional federal FTEs decrease risk of delays and cost overruns within LEP programs?

A12. NNSA has continued to hire additional FTEs within the Office of Defense Programs and in other mission support areas at the request of hiring managers by utilizing our Excepted Service (EN) appointing authority.

In Fiscal Year (FY) 2019, NNSA filled 99 positions externally under the EN authority. Out of our allocation of 600 authorized EN FTE, NNSA is currently at 597. To continue leveraging the EN appointing authority, NNSA balances the start date of new EN employees with Agency separation dates for departing or retiring EN employees. NNSA provided technical assistance drafting legislative language to remove the statutory cap on NNSA's EN authority so that it can be used to hire the program management professionals needed to manage the programs.

As part of the root cause analysis and lessons learned from this delay, NNSA's Office of Defense Programs identified the need for additional federal project management and oversight staff on each of the respective weapons modernization programs. This need for additional federal FTEs in the Office of Defense Programs is consistent with two independent staffing studies conducted by the Office of Personnel Management (OPM)

and NNSA's Office of Cost Estimating and Program Evaluation. NNSA is actively recruiting to fill these positions.

QUESTION FROM REPRESENTATIVE KENDRA HORN

Q15. Dr. Verdon: how will working on the ongoing programs for longer at Kansas City affect workload at Pantex and delay start to W80-4 (and potentially W87-1) at Kansas City?

A15. NNSA has identified a path forward to rebalance work at Pantex due to this delay. NNSA continues to assess the impacts of the delays in the B61-12 LEP and W88 Alt 370 on the W80-4 LEP and W87-1 Modification Program. Once this assessment is completed, NNSA will inform stakeholders of the results and will identify any impacts to other ongoing warhead modernization activities.

QUESTION FROM REPRESENTATIVE KENDRA HORN

Q16. Dr. Verdon: you note in your testimony that NNSA has moved to procuring around 70% of warhead components from commercial vendors. Given recent issues, have NNSA's assumptions about the use of COTs changed for future warhead programs? If so, how would this affect floor space and other needs at Kansas City? Would infrastructure and production support costs increase? Also, at the time that NNSA shifted its strategy to purchase more COTS, what additional steps did it take to ensure the quality of purchased components? Describe in detail how these steps have been found now to be insufficient.

A16. NNSA has determined that the use of COTs is still a viable approach for our weapons modernization programs, but requires a modification to the approach for implementation that existed at the start of the B61-12 LEP and W88 Alt 370. As part of the lessons learned from the B61-12 LEP and W88 Alt 370, NNSA is modifying our approach to the continued use of COTs in weapon warhead modernization programs. These changes include:

- Earlier and more frequent interactions with the vendors to ensure they understand NNSA's requirements for the use of their components and NNSA understands their ability to provide the parts to meet our requirements.
- On a case-by-case basis, if no vendor can be identified to provide the needed parts/component, design requirements cannot be reasonably altered to accommodate available commercial parts, and NNSA is not able to support or establish commercial sources of supply, then NNSA will bring the production of those components in-house.
- Increased and earlier testing of purchased COTs parts to ensure requirements are being met and lot-to-lot variations are assessed.
- Development of an approved COTs parts/vendor catalog with the requirement that if a previously approved vendor/part was shown to meet requirements it will be used in

new applications. Further, if the design or production site wants to use a new component for ostensibly the same application, the justification for this will need to be reviewed.

- Since the original time of the selection of the parts now in question (2014), improved Military Performance Standards have been established that help to ensure that parts identified will meet NNSA's warhead life requirements.

When NNSA decided to place more reliance on the use of COTS parts, our Management and Operating (M&O) contractors created a COTS parts use and qualification methodology. This methodology was based on best engineering practices of the time and was shown to be adequate in the past. The B61-12 LEP, due to the complexity of the warhead and its requirements, represented the first warhead modernization program requiring the use of a much larger number of COTS components. A key shortcoming in the original methodology was an underestimation of the potential lot-to-lot variations that could occur in COTS parts production.

Workload increases require the identification of additional manufacturing/production floor space at a number of NNSA's M&O sites. NNSA is working with the Kansas City National Security Campus and Sandia National Laboratories to execute plans to identify and provide this space in time to support all of our currently ongoing warhead modernization programs.