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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2020
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED SIXTEENTH CONGRESS
FIRST SESSION
SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FISCAL YEAR 2020 PRIORITIES
FOR ATOMIC ENERGY DEFENSE,
NONPROLIFERATION, SAFETY, AND
ENVIRONMENTAL MANAGEMENT**

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**FISCAL YEAR 2020 PRIORITIES FOR ATOMIC ENERGY
DEFENSE, NONPROLIFERATION, SAFETY,
AND ENVIRONMENTAL MANAGEMENT**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Tuesday, April 9, 2019.

The subcommittee met, pursuant to call, at 3:15 p.m., in room 2118, Rayburn House Office Building, Hon. Jim Cooper (chairman of the subcommittee) presiding.

Mr. COOPER. The subcommittee will come to order. Let us first ask for the Lamborn unanimous consent to allow full committee members to ask questions at the end. Hearing no objection, so moved.

You are close there. Larsen nearly objected.

Second, I would like to ask unanimous consent that both opening statements and member, witness testimony be inserted for the record. Hearing no objections, so moved.

I would like to welcome everyone to this hearing on the fiscal year 2020 budget request for atomic energy defense, nonproliferation, safety, and environmental management.

Here today, we have Administrator Lisa Gordon-Hagerty, Assistant Secretary Anne White, and Chairman Bruce Hamilton.

We also have backup experts in the audience such as Admiral James Caldwell, Director of Naval Nuclear Reactors; Dr. Charles Verdon, Deputy Administrator for Defense Programs; and Brent Park, Deputy Administrator for Defense Nuclear Nonproliferation.

Any of these folks may be called to provide the subcommittee more information if members request it. Rather than continue with my opening statement, I will just ask that it will be inserted for the record.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 37.]

Mr. COOPER. And I would like to turn to the ranking member for his opening statement.

Mr. TURNER. I will do the same, Mr. Chairman. Thank you. Submit my statement for the record. Thank you.

[The prepared statement of Mr. Turner can be found in the Appendix on page 39.]

Mr. COOPER. Thank you.

I want to apologize to the witnesses for the late start due to votes—unavoidable. But why don't we start by hearing Lisa Gordon-Hagerty.

STATEMENT OF HON. LISA E. GORDON-HAGERTY, ADMINISTRATOR, NATIONAL NUCLEAR ADMINISTRATION; ACCOMPANIED BY ADM JAMES CALDWELL, USN, DIRECTOR OF NAVAL NUCLEAR REACTORS, AND DR. CHARLES VERDON, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS

Ms. GORDON-HAGERTY. Chairman Cooper, Ranking Member Turner, and distinguished members of the subcommittee, thank you for the opportunity to present the President's fiscal year 2020 budget for the Department of Energy's National Nuclear Security Administration [NNSA].

It is an honor to appear before you today, proudly representing an extraordinary team at NNSA, a team that is indispensable for our Nation's nuclear security. I am also delighted to be sharing this hearing with my friend and colleague, Assistant Secretary Anne Marie White.

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

Mr. COOPER. So moved.

Ms. GORDON-HAGERTY. Thank you. Since I last testified before the committee, NNSA has been diligently working to execute our three enduring missions. One, ensuring the safety, security, and effectiveness of the U.S nuclear weapons stockpile; two, reducing the threat of nuclear proliferation and nuclear terrorism around the world; and three, providing nuclear propulsion for the U.S. Navy's fleet of aircraft carriers and submarines.

The President's fiscal year 2020 budget request for NNSA is an investment in these missions and in our infrastructure and people. My priorities with this crucial funding are to revitalize the United States defense plutonium capabilities and other essential infrastructure, to keep our stockpile life extension programs on schedule and on budget, and to recruit the workforce of the future.

My focus is to set these conditions today for a resilient and responsive nuclear security enterprise for the next 50 years and beyond. The 2018 Nuclear Posture Review [NPR] provided a realistic view of the world. With an evolving and uncertain geopolitical landscape, the NPR states that there is no margin for further delay in recapitalizing the nuclear security enterprise, an enterprise comprised of eight laboratories, plants, and sites and a dedicated workforce of almost 44,000 employees.

NNSA's \$16.5 billion request is a necessary investment when you consider the stakes. Russia and China are pursuing entirely new nuclear weapons capabilities. North Korea's intentions remain unclear. And we face the most complex and demanding global security environment since the end of the Cold War.

Accordingly, the fiscal year 2020 budget request represents the largest increase for our nonproliferation, counterproliferation, and nuclear counterterrorism program in 5 years. The NPR reaffirmed the need for effective arms control measures and treaty verification and with this funding, NNSA will continue to apply its technical expertise to reduce nuclear threats around the world.

During my nomination hearing last year, I stated that my highest priority was plutonium pit manufacturing. That has not changed. For the next several decades, NNSA will rely on a combi-

nation of newly manufactured pits and a judicious reuse of existing pits to modernize the existing U.S. nuclear weapons stockpile.

A modest pit manufacturing capability is necessary to ensure the safety and security of refurbished warheads while maintaining high confidence in stockpile effectiveness. Consistent with the NPR, NNSA is committed to producing no fewer than 80 pits per year by 2030 to meet military requirements.

Last May, the Nuclear Weapons Council endorsed NNSA's path forward to recapitalize a production capability that was shuttered in the early 1990s. Our two-site approach calls for pit production at both the Los Alamos National Laboratory in New Mexico and at the Savannah River Site in South Carolina.

Following this strategy, the fiscal year 2020 budget request includes \$410 million for conceptual design activities at Savannah River plutonium processing facility and our request also calls for a nearly \$500 million investment in the plutonium pit production capabilities at Los Alamos.

NNSA is not only investing in plutonium pit mission. Thanks to the strong support of Congress, we are making significant progress in modernization across our enterprise. We have started construction of the main buildings of the Uranium Processing Facility [UPF] at the Y-12 National Security Complex. And I am proud to report that this vital undertaking has been on budget and on schedule for the last 6 years. We remain on track to deliver UPF by the end of 2025 for not more than \$6.5 billion.

All of NNSA's enduring missions are underpinned by state-of-the-art scientific capabilities. As these capabilities become more important during this time of renewed great power competition, NNSA is working to stay ahead of the technology curve.

A future gap in high performance computing is being addressed through a joint effort between the Department of Energy's Office of Science and NNSA. Our contribution to that effort will be undertaken at Lawrence Livermore National Laboratory and we will deliver an exascale computing platform to the enterprise in 2023. NNSA is also moving forward with a project to enhance the experimental capabilities at the Nevada National Security Site, which is a crucial element for our stockpile stewardship mission.

From the earliest days of the Manhattan Project, the dedicated men and women of the nuclear security enterprise have answered our Nation's call. What our team has accomplished today is remarkable. We completed the W76-1 Life Extension Program under budget and ahead of schedule. We have five warhead modernization programs underway, all of which are on budget and on schedule.

We have helped 33 countries plus Taiwan to become free of highly enriched uranium. We routinely deploy nuclear security experts to major public events like the Super Bowl to keep the public safe from a radiological threat.

And we are lending unparalleled expertise to the U.S. Navy's new *Columbia*-class program to ensure sea-based deterrence capabilities for decades to come. Finally, I would like to emphasize that regardless of the investments we make in modernizing our infrastructure, the United States must continue its investment in our world-class workforce as requested in the President's 2020 budget.

We face stiff competition from the private sector for top talent in highly technical fields. With an aging workforce, NNSA has launched an integrated effort to recruit the next generation of scientists, engineers, and technicians, so that we can continue to answer the Nation's call and meet tomorrow's challenges.

No other government or civilian agency can accomplish these unique missions on behalf of the American people, and I could not be prouder to represent NNSA today.

Thank you for your strong and consistent support and the opportunity to testify before you today. And I look forward to answering your questions. Thank you.

[The prepared statement of Ms. Gordon-Hagerty can be found in the Appendix on page 41.]

Mr. COOPER. Thank you.

Ms. White.

STATEMENT OF HON. ANNE MARIE WHITE, ASSISTANT SECRETARY FOR THE OFFICE OF ENVIRONMENTAL MANAGEMENT, UNITED STATES DEPARTMENT OF ENERGY

Secretary WHITE. Chairman Cooper, Ranking Member Turner, and members of the subcommittee, thank you for the opportunity to appear today. And I share your sentiment as well. It is good to be here with you today.

The fiscal year 2020 budget request of \$6.5 billion demonstrates the administration's commitment to tackling the environmental legacy of nuclear weapons production that helped end World War II and the Cold War.

Mr. Chairman, this year marks the 30th anniversary of the EM [Environmental Management] program. Since its inception our dedicated workforce has cleaned and closed sites, dramatically reducing EM footprint from 107 sites to just 16.

Progress continues at every EM site. Last year alone, we took another significant step towards large-scale cleanup at the Y-12 site at Oakridge by removing over 3 tons of mercury from equipment and completing all of the site preparation required for construction of the mercury treatment facility.

Workers in South Carolina consolidated more than 400,000 cubic yards of coal ash and ash-contaminated soil at the Savannah River Site. They got it done safely and 14 months ahead of schedule, saving \$9 million and earning them the Project Management Institute award for project excellence.

And at Hanford, workers began installing equipment to excavate highly contaminated soil under the 324 Building. Even with great work and significant budgets, cleanup progress is being significantly outpaced by environmental liabilities.

Mr. Chairman, during my confirmation hearings, I committed to enhance safety through risk mitigation and cleanup and to eliminate overall taxpayer liability. That is precisely what I have been focused on during my first year on the job.

We are getting a clear picture of EM liabilities for the first time, using accurate up-to-date cost and schedule data, something I prioritized immediately. We are shifting to a sustainable cleanup approach that uses the latest scientific knowledge in waste composition, risks, and attainable end states.

And we are increasing accountability to Congress and to the American people through stronger project management and oversight. There are some opportunities with the real potential to get cleanup projects done and off the books safely, sooner, and at a reasonable cost.

The Department is evaluating these opportunities, including new technologies, treatment options, and disposal capabilities, in a comprehensive way. We look forward to engaging with Congress as well as the greater cleanup community on the best ways to move forward with site options assessments currently underway.

Following on recommendations from wide-ranging and nonpartisan groups, the Department is also evaluating its interpretation of the statutory term, high-level radioactive waste. EM is also taking steps to get the best value out of every cleanup dollar that Congress and the American people provide.

That includes identifying impactful regulatory reforms and improving procurements through a new end state contracting model. As EM is put in a sustainable path forward, the budget request provides the resources to build upon recent successes and bring a renewed sense of urgency to the program.

The request enables meaningful progress throughout the cleanup complex, including ramping up efforts to address radioactive tank waste at the Savannah River Site and at Hanford. At Oakridge, the request advances construction on the Outfall 200 Mercury Treatment Facility, continues D&D [deactivation and decommissioning] at the East Tennessee Technology Park, and continues preparations to support processing the remaining U-233 material at the Oakridge National Laboratory.

In the interest of time, I will stop there and just note that more details about the work we have planned next year are provided in my written testimony. Mr. Chairman, EM's historical successes have been achieved through the dedication of leaders on both sides of the aisle, determined to drive the cleanup mission toward completion.

I want to express my desire to work with Congress towards a future that delivers results for cleanup communities and all U.S. taxpayers. I appreciate this opportunity and the subcommittee's support of the EM mission.

[The prepared statement of Secretary White can be found in the Appendix on page 55.]

Mr. COOPER. Thank you, Ms. White.

Mr. Hamilton.

STATEMENT OF HON. BRUCE HAMILTON, CHAIRMAN, DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Mr. HAMILTON. Thank you, Chairman Cooper, Ranking Member Turner, distinguished members of the committee, it's an honor to be here before you today as the chairman of the Defense Nuclear Facilities Safety Board to share my observations on the challenges that the Board has associated with providing oversight to the Department of Energy's defense nuclear facilities.

As I believe has been the past practice, I have submitted extensive written remarks for the record. Those were unanimously approved by my Board. In the interest of time, I will limit my oral

comments to only those topics you, Mr. Chairman, specifically mentioned in your invitation letter to this hearing.

I, not the Board as a whole, are responsible for any deviations from the written remarks as well as for any responses to questions you might have. For those members of the subcommittee who may not be familiar with the work of the Board, our mission is to conduct independent oversight of defense nuclear facilities and to inform the Secretary of Energy when we find issues that challenge the adequate protection of the public.

The President's fiscal year 2020 request for the Board is \$29.45 million for 100 full-time equivalent employees. This is a 5 percent decrease from the agency's fiscal year 2019 appropriation level of \$31 million. The Board's foundation is built on the expertise of the Board members and our staff, and approximately two-thirds of our annual budget is dedicated to salaries and benefits.

Mr. Chairman, you specifically asked me to address any recent recommendations to the Secretary of Energy. There is one recommendation, 2019-1 entitled Pantex Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation. It was issued on February the 20th.

This recommendation focuses on three main topics at Pantex. First, the lack of adequate controls for high-consequence hazard scenarios; two, deficiencies in portions of the safety basis for the nuclear explosive operations; and three, deficiencies within the Pantex Special Tooling Program. The Board is currently awaiting a response from the Secretary of Energy of whether he accepts that recommendation and whether or not there will be an implementation plan.

In your letter, Mr. Chairman, you asked about Department of Energy Order 140.1, Interface with the Defense Nuclear Facilities Safety Board, issued in May of last year to replace a prior DOE [Department of Energy] directive.

Order 140.1 incorporated major changes, including new restrictions and protocols regarding the Board's access to information, facilities, and personnel. It is the unanimous view of the Board that DOE Order 140.1 is in direct conflict with a plain reading of the Atomic Energy Act in several ways.

For instance, the order defines the public as existing only outside geographical site boundaries. Such an interpretation could preclude the Board from oversight for workers, collocated workers, and general members of the public who happen to be inside that site boundary.

Notably, and this is particularly important for places like Y-12 in Tennessee, notably it could also prevent Board oversight for important programs such as criticality safety. Not only is this inconsistent with the Atomic Energy Act, but this would be a clear departure from well-established past practices.

Lastly, Mr. Chairman, you asked me to address my proposal to reduce our staff size. On August 14th of last summer, the Board approved in a vote of three in favor, one opposed on a motion made by me to improve effectiveness in conducting our mission through more robust field oversight and a leaner, nimbler headquarters staff.

The motion would have established an executive director of operations, restructured the agency's organization primarily by adding two new field offices and by assigning resident inspectors for facilities which currently don't have them, and by reducing employee headcount through attrition to about 79.

Our congressional appropriators did not support this plan and they included language in the Energy and Water Development and Related Agencies Appropriation Act of 2019 which preempted its implementation.

Consequently, I have made no structural changes to our organization. I have directed the hiring of employees to backfill specific positions, and although we remain below our fiscal 2019 funded 117 employees, we will hire in order to achieve the 100 employees that are proposed in the 2020 budget. This concludes my oral remarks.

[The prepared statement of Mr. Hamilton can be found in the Appendix on page 64.]

Mr. COOPER. Thank you, Mr. Hamilton.

I will begin the questioning and I will try to just use my 5 minutes.

Ms. Gordon-Hagerty, I have a number of things I want to ask you. Let me begin by, if you are familiar with the role that the Jasons[†] have played and possibly also the Naval Research Advisory Committee in terms of nuclear and other forms of scientific expertise.

Ms. GORDON-HAGERTY. I am.

Mr. COOPER. You are familiar?

Ms. GORDON-HAGERTY. Yes.

Mr. COOPER. How would you categorize their performance over the last 60, 70 years?

Ms. GORDON-HAGERTY. I can speak to two recent studies—

Mr. COOPER. We can't quite hear you. Can you pull the microphone closer?

Ms. GORDON-HAGERTY. Is that any better?

Mr. COOPER. Yes.

Ms. GORDON-HAGERTY. My apologies. So I can express to you my opinion on the two recent studies that were undertaken by Jasons, one of which was the Tritium study. I found their reports to be fulsome and very—the members of JASON being very knowledgeable about issues associated with our programs at NNSA. I can't speak to the history or the 60, 70 years of Jasons, but I can tell you that they are rich in history and their technical expertise is sound.

Mr. COOPER. Were you aware that their contract has been summarily terminated by the Pentagon?

Ms. GORDON-HAGERTY. My understanding is that the Pentagon is doing something with their contract. They do manage the contract or administrate the—administer the contract for JASON.

Mr. COOPER. Doing something with the contract is a euphemism for termination?

Ms. GORDON-HAGERTY. My understanding, again, I haven't looked into it. I have actually asked my staff, Chairman, to look

[†]JASON is an independent scientific advisory group that has since 1960 provided consulting services to the U.S. Government on often sensitive scientific and defense issues. Its members are known as "Jasons."

into it to see what is happening, because we do have some studies that we are undertaking with JASON, so we want to make sure that if there are some issues associated with contract management that somebody handles that, because we do have some ongoing studies with Jasons.

Mr. COOPER. Another topic, it seems like one of the largest future expenditures, if not the largest, that you have jurisdiction over will be whether we have a second a site for a plutonium sustainment program, that second site being Savannah River. It is my understanding that the lifecycle cost of that would be an additional \$13, \$14 billion if we undertake that second site. So that is a large sum of money, especially given the size of your budget, that is roughly the size of your annual budget for your entire NNSA.

So it seems like this decision is really not being presented to Congress as a decision, but more as a fait accompli, because in this budget as you stated in your oral testimony, you are asking for \$410 million for advanced design work on repurposing the MOX [mixed oxide fuel] facility.

In my lay terms, that would be two luxury skyscrapers in Nashville, Tennessee. And this is just for blueprint work for a proposed rehab of a building. But it seems like if we invest that money, then we will be well into the \$14 billion expenditure for a second site.

So I would find it more useful for the subcommittee for all the members to try to make a decision on that instead of being forced into a decision by spending a little bit money here, a little bit money there. Pretty soon, you are a little bit pregnant and then we have the whole \$14 billion. So are you aware of another area in which we could save \$14 billion?

Ms. GORDON-HAGERTY. In a word, no. There is not another place where I can see that happening. However, we are working to advance the Department of Defense requirements as directed by Nuclear Weapons Council to produce not less than 80 pits per year for our nuclear weapons stockpile, to maintain our existing nuclear weapon stockpile with the life extension and modernization programs.

To that end, again, to recall for the members of the subcommittee, we haven't had a plutonium production capability since the early 1990s.

The last time we produced 11 "war reserve," what we call diamond-stamped pits for the United States, was over two decades ago. We are trying to modernize and recapitalize that capability at Lawrence, excuse me, Los Alamos National Laboratory. We have them on a path forward and progress to produce not less than 10 pits per year in 2024, 20 pits in 2025, and in 2026, maintain 30 pits per year. That is really stretching their capabilities. After all, Los Alamos National Laboratory and Lawrence Livermore National Laboratory are known to be nuclear weapon design agencies, not production sites.

And, again, we shuttered our production capabilities in the early 1990s. We are modernizing an existing stockpile and in order to do so we need nuclear weapons or the pits for those nuclear weapons. And in order to get to that 80 pits per year and recognizing the challenges we have ahead of us in 11 years—in 11 years, we are going to have to produce not less than 80 pits per year.

We conducted an analysis of alternatives and an engineering assessment. And the best way to get there given the risk and risk mitigation factors is to repurpose the facility at Savannah River Site and produce the remaining 50 pits per year starting in 2030 at Savannah River Site.

And we believe that that is good investment of taxpayer resources, because otherwise we will not be able to get to that 80 pits per year if we looked at the plan of going forward at Los Alamos, which would consider major new construction activities.

Mr. COOPER. Well, you have used most of my time. I would like more information on your May 2018 plutonium pit production engineering assessment results, because I—

Ms. GORDON-HAGERTY. I would be pleased to do so.

Mr. COOPER [continuing]. Think that you are reaching more of a conclusion than perhaps they did. I have rarely heard of a competitive bid situation in which one bidder is twice as expensive as the other bidder, and yet there is such enthusiasm for bidding—awarding the bid to the by far, the highest bidder. I have nothing against South Carolina or Savannah River, but \$14 billion is \$14 billion.

You stated earlier you didn't know of another way to save that money. And let us see if we can't save a bit here. So I would at least like detail on this study, not just raw conclusions.

Ms. GORDON-HAGERTY. Fair enough. And those are lifecycle costs.

Mr. COOPER. I understand that.

Ms. GORDON-HAGERTY. Thank you. And I will be pleased to come by and brief you specifically about these—

Mr. COOPER. Our taxpayers back home are concerned about their life cycle, and we are spending a lot of their money, sometimes for very little result. I see that my time is expired. I will turn to the ranking member.

Mr. TURNER. Miss Gordon-Hagerty, the goal of 80 pits per year, is that arbitrary or is that based upon our needs for a modernization?

Ms. GORDON-HAGERTY. That is based on needs set forth by STRATCOM [U.S. Strategic Command] and Nuclear Weapons Council to produce not less than 80 pits per year, and that is for our future nuclear weapons needs.

Mr. TURNER. Okay. Thank you. Mr. Hamilton, when you began your opening statement—and I don't have a question for you yet, I just wanted to make a comment on your, in true oversight fashion, you gave what I think may be the first time I have heard an opening statement that had a disclaimer in front of it, but I really appreciate what you do, because what you do is go around and identify things that could be an issue that everyone needs to address and be concerned with. I am going to bring up one of those.

Miss Gordon-Hagerty, so you have such unbelievable depth of responsibility, because you are dealing with nuclear material, nuclear weapons, it is enormous really the complexity of what has to be done to ensure safety and ensure compliance.

My understanding that you have received a letter, which I have a copy of, from Mr. Hamilton, March 21st, the Defense Nuclear Facility Safety Board, that raised a concern about the Nevada National Security Site, stating the facility continues to operate with-

out accounting for the increase in seismic hazard and without evaluating whether the accredited structure, systems, and components can perform their safety function during and after a seismic event.

Could you do us a favor? First, could you describe the importance of the Nevada National Security Site, some of the concerns and issues that you must deal with there? And then, could you comment on Mr. Hamilton's letter?

Ms. GORDON-HAGERTY. Thank you. I will be happy to.

First of all, the Nevada National Security Site is a profoundly important site, one of the eight labs, plants, and sites that makes up the National Nuclear Security Administration. It provides a profoundly important role and it has got a storied history. For 70 years now it was the Nevada Proving Grounds, where we conducted 100 atomic tests above ground and 828 underground nuclear weapons tests to certify our nuclear weapons stockpile.

We have not conducted an underground nuclear weapon test since 1992, where we voluntarily committed to no more nuclear explosions. However, the programs that are there are unique. We continue to certify our nuclear weapons stockpile by conducting critical experiments called subcritical experiments at the U1a Tunnel at Savannah—excuse me, at the Nevada Nuclear Security Site. We also conduct a number of other programs.

We have trained over 200,000 first responders in nuclear and radiological first responder response capabilities at the Nevada National Security Test Site—Nevada National Security Site. Excuse me. I am from the old school. I still call it the Nevada Test Site.

So nonetheless it plays a critically important and unique role in assessing and certifying our nuclear weapon stockpile. To the extent at the DAF or the Device Assembly Facility to which you alluded and the Defense Board had made—had cited their concerns, the scenario that they have described actually is a resulting, is a nuclear detonation or, excuse me, concerns expressed are resulting from an explosion as a result of an earthquake that induces uncontrolled release of radioactive materials as a result of nuclear explosions.

Unfortunately, we do not even conduct nuclear explosive testing or evaluation of nuclear explosive operations. That is neither authorized or do we conduct those kinds of operations at the Device Assembly Facility.

So the scenario that they have drawn out is not something that could occur, since we don't conduct nuclear explosive operations at the DAF.

Mr. TURNER. Two more questions for you, and then I will get to Mr. Hamilton on the same letter. The 76-2, great interest as a result of Russia's change in nuclear doctrine to escalate to de-escalate, low-yield nukes have become a considerable issue.

Could you please tell us why we need this for our deterrence strategy and does it make the use of nuclear weapons more likely or less likely?

Ms. GORDON-HAGERTY. First of all, we are in—I am sure everybody would agree, we are in an era of renewed strategic peer competition and evolving threats. The 76-2 is not a new nuclear weapon. It is a low-yield nuclear weapon that is a modification of the 76-1 that was just completed. And it does not either increase or de-

crease the likelihood of war or nuclear war. What it does is it provides the President and provides our military planners with a diversity in the nuclear weapon stockpile.

Mr. TURNER. At the same time, isn't there some concern that if we only have high-yield nuclear weapons and Russia has low-yield and they use one that they would think we would be less reticent or more reticent to respond, and therefore we have a lessened deterrence against Russia's actions?

Ms. GORDON-HAGERTY. That is the ongoing argument. However, we have had low-yield nuclear weapons in our stockpile and currently do.

Mr. TURNER. And so far we have deterred everyone.

Mr. Hamilton, first off, thank you for what you do because you have the technical expertise to take a look at—you are the what-could-go-wrong scenario guy. And I appreciate that because everybody else then has to take a look and say, Okay, could this go wrong, could this not go wrong, what do we need to fix? With respect to this letter and her response, what are your thoughts?

Mr. HAMILTON. I concur with everything I just heard Administrator Gordon-Hagerty say. The facility was designed for much larger quantities of material at risk than are currently in the facility because we suspended but did not eliminate all future possibility of testing.

The standards to which that facility are designed and built are based on the largest amounts of MAR [material at risk] that could happen in a testing scenario. They don't do that right now.

So our letter was specifically addressing, given the set of parameters that you are designed for, you have some new seismic information that needs to be added to the calculation.

I would also like to point out that we were developing this information for this letter late last calendar year and early this spring, and it was issued well before we even knew that NNSA was going to ship plutonium from Savannah River to the DAF in Nevada. So we didn't know about any of that and we didn't care about any of that. It was irrelevant to us.

The plutonium that was shipped there from Savannah River is—does not affect our calculations at all.

And I would like to just say the bottom line is that our concern was the NNSA's documentation needs to be refined based on new information, but there is an erroneous perception in the press that the DAF is not, is unsafe. The press even called it a ticking time bomb.

This hyperbole could not be further from the truth. For its current mission, as what Administrator Gordon-Hagerty defined, for its current mission, DAF is unequivocally not a challenge to the adequate protection to the public health and safety. If it were, the Board would have issued a formal recommendation, which we did not.

Mr. TURNER. Mr. Hamilton, I greatly appreciate your expertise and your clarification of that. Thank you both for what you do because you help keep us safe.

Mr. COOPER. Mr. Larsen.

Mr. LARSEN. Secretary White, the budget cuts Hanford cleanup by about \$400 million. And I am wondering what assessment you

have of the lower budget—the impact of cleanup operations and timelines at Hanford as a result of the lower budget.

Secretary WHITE. So we believe that the budget is adequate for our needs in 2020, and we are moving forward. We also had an update in our lifecycle baseline cost estimate and we are moving out quickly to address that by developing, as required by our project management orders, an analysis of alternatives, which is due at the end of the fiscal year. So we are confident that we can move out and accomplish what we need to at Hanford for 2020.

Mr. LARSEN. Yes. So your new lifecycle report estimates the cleanup from—costing between \$323 billion and \$677 billion, is that about right?

Secretary WHITE. Yes.

Mr. LARSEN. So—I could have given you that estimate. That estimate is a \$354 billion difference. And we are frustrated in Washington State with having to clean this up. We are frustrated with the Federal Government and you are not alone in our ire in terms of being a target of our ire.

Why is there a \$354 billion difference in the high- and low-end estimate? Why isn't it any closer given everyone's past experience at Hanford?

Secretary WHITE. So the higher number is what we call an 80 percent probability number. And what it does, is it realizes some risks that we are very likely to encounter. It also takes into account updated operational costs that involve operating multiple facilities at the same time. And further, the cost estimate had not been, the lifecycle cost estimate had not been updated since 2009.

So in order for us to work with you all in the State of Washington and really progress cleanup, we have to be transparent and we have to know what we are dealing with, so that we can have fruitful discussions about the go-forward because we are committed to Hanford cleanup.

Mr. LARSEN. Thanks. It almost seems like a function of new people coming in and wanting to get up to date, but there isn't—I mean there is a lot not to know. But given our collective experience there, there is a lot we already know.

What don't we know, that resulted in a 25 percent cut to the Richland operations and a 12 percent to the ORP [Office of River Protection] in this proposed budget?

Secretary WHITE. So I don't think the—in fact, I know the lifecycle baseline was not related to that and—

Mr. LARSEN. Yes, right. I understand.

Secretary WHITE. As we go forward, as I say, we need to drive some innovations and as Chairman Cooper mentioned, budgets are a big deal and we need to be mindful of the cost.

So I am just looking forward to working with you and others of the Washington delegation to move things forward, because we have a moral, legal, and ethical responsibility to do so.

Mr. LARSEN. So in the Federal Register of 2018, in your testimony, you noted that the Department is seeking public comment on this interpretation about reclassifying high-level radioactive waste. A frightening proposal and my—so if you want my public comment, it is a frightening proposal.

You also note the Department's consideration of a new interpretation does not alter or abrogate responsibilities or policies under existing regulatory requirements or agreements.

How am I supposed to read that comment? Is it that you—it doesn't impact your existing regulatory requirements or agreements forever, or until a new, until a new rule is in place?

By the way, I assume that new rule would actually reclassify high-level to something less than high-level and we would be sitting on high-level radioactive waste that you, the Federal Government would consider not as high-level radioactive waste.

Secretary WHITE. So what we are doing is an interpretation, not a reclassification and we—

Mr. LARSEN. I don't know if there is a legal difference in that, but there is a common sense difference in that there is no difference to a lay person.

Secretary WHITE. So the issue with the high-level waste definition is that traditionally high-level waste is based on the source that created it. What we are doing is we are saying, okay, we want to determine what is and is not high-level waste based on the actual radionuclide content of the waste.

And that is a sound technical decision. It is a sound way to look at this problem. And it is not just for a minute that this definition won't abrogate our responsibilities.

We have consent orders. We have got the TPA [Total-system Performance Assessment]. There is NEPA [National Environmental Policy Act]. There is RCRA [Resource Conservation and Recovery Act]—

Mr. LARSEN. Yes.

Secretary WHITE. So we completely understand that.

Mr. LARSEN. I will continue to be very curious about how this goes forward, and I think I speak for the Democrats and Republicans in the delegation in Washington State as well, at least how this impacts Washington State.

Secretary WHITE. Can I come over and brief you in more detail at some point in the future?

Mr. LARSEN. I would welcome that.

Secretary WHITE. I would like—

Mr. LARSEN. Probably wouldn't be just me, if you don't mind—

Secretary WHITE. All right.

Mr. LARSEN. Great. Thanks.

Secretary WHITE. Thanks.

Mr. COOPER. Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman. And, Miss Gordon-Hagerty, I thank all you of you for being here today.

Ms. Gordon-Hagerty, currently the Savannah River Site has excess weapons-grade plutonium; 34 metric tons were to be turned into fuel through the MOX program, the mixed oxide fuel fabrication facility. Now, the NNSA is using the dilute and dispose method.

During your Senate hearing, you promised another half metric ton of plutonium would be removed by the year 2020.

What is the plan to relocate the direct shipment of the half metric ton of plutonium? And what is the planned timeline cost for the

dilute and dispose method over the next 5 years to remove the excess plutonium out of the site?

Ms. GORDON-HAGERTY. Representative Wilson, we are under court order to remove not less than one metric ton of weapons-grade plutonium from the Savannah River Site by the end of 2019, so by January 1st, 2020.

As you are aware, we have already removed and it has been noted in the newspaper, we have removed a half a metric ton of the material. We will remove or have already removed, one or the other.

Because our class, our shipments of nuclear weapons, of nuclear materials obviously require the utmost operational security, so I am not at liberty to discuss the movements, the shipments, the dates, the times, the locations, the routes of those materials.

But we are under court order and we will make the date by the end of December 2019.

Mr. WILSON. And then as to the dilute and dispose, what is the timetable?

Ms. GORDON-HAGERTY. In the dilute and dispose, we are—we thank Congress for the support that we received last year of \$25 million to continue with the design of the glove boxes. This is a planned path forward where we know we will be able to do so for less than 50 percent of the cost of the MOX facility.

We will move the dilute and dispose, and we will be undertaking those operations in the mid-2020s. We will start to do the dilute and dispose—a known technology. And we have used that technology for more than 5 metric tons of radioactive waste.

Mr. WILSON. Thank you. And Ms. White, the H Canyon at Savannah River Site is the only operating production-scale radiologically shielded chemical separations facility in the United States.

Are the appropriate investments at H Canyon in both infrastructure and staffing being made for it to be fully able to process fuel that is now stored at site and additional materials the site continues to receive?

Secretary WHITE. Yes. So H Canyon continues to be a somewhat of a maintenance challenge. We are working through those issues and we have actually launched an independent project team [IPT] to determine in what ways we could maybe increase operational efficiency and address raising production rates out of H Canyon.

So it is an extremely important facility to the United States and as you note duly, it is the only one of its kind. So it is a very precious resource.

Mr. WILSON. And are there existing or new processing technologies that you are exploring that could be located within H Canyon to enhance its capabilities to complete its missions?

Secretary WHITE. Yes. We are looking at different types of technology. There is discussions about a hub and spoke where we would slowly but surely build on, different technologies, and the IPT is also looking at that.

So we will have a lot to brief you on when that team gets done with its work.

Mr. WILSON. Well, we appreciate it again. H Canyon is just so critical for our country and we want to make sure that it is properly used, and any missions that can be provided.

Additionally, back again, for the design work on the repurpose of MOX, Ms. Gordon-Hagerty, it requires a skilled workforce for the success of the mission.

What are the training recruitment incentives and programs that have been implemented to achieve related to the pit production? Are you working with local universities and technical colleges?

Ms. GORDON-HAGERTY. Yes. Well, not only at the Savannah River Site do we have the challenges with our workforce. In the next 5 years, 40 percent of our workforce throughout our entire nuclear security enterprise is retirement-eligible. So that is a challenge across our entire space of our eight labs, plants, and sites, and our field offices and our headquarters.

We are taking on what I would consider an unorthodox, very challenging way of looking at hiring practices. We are actually going—looking at a corporate-wide approach across all of our labs, plants, and sites. In fact, this week we had a hiring team at Georgia Tech—excuse me, last week; Texas A&M this week; Purdue on Thursday; and then next week at University of California at Merced. So we are looking at different ways of hiring a robust workforce for our entire enterprise.

Specifically the Savannah River Site, we are working with Aiken Technical College and other places around the communities to try to figure out what we need for our workforce strategies for now and in the future.

So we are absolutely working closely with the City of Aiken and with the surrounding communities.

Mr. WILSON. Well, Aiken Tech is an extraordinary facility.

Thank you, Mr. Chairman.

Ms. GORDON-HAGERTY. Yes, thank you.

Mr. COOPER. Mr. Garamendi.

Mr. GARAMENDI. I thank you, Mr. Chairman. And for the witnesses, thank you for being here and your testimony.

I want to go to a question that Mr. Hamilton, you raised. And my question really goes to Ms. Gordon-Hagerty.

Why are you limiting the ability of the Defense Nuclear Facilities Safety Board to do its work?

Ms. GORDON-HAGERTY. Representative Garamendi, I would interpret our update of the 140 order as an update. It has not been updated within the Department of Energy for more than a decade.

What we are doing is trying to make sure that we understand within the Department of Energy, and I hope Assistant Secretary White would agree with me, that what we are trying to do is ensure that we articulate our roles and responsibilities and authorities and accountability within the Department of Energy, because if there is an accident or significant incident, we will be the ones held responsible.

So it is our obligation to ensure our health and safety is sacrosanct at all of our defense nuclear facilities.

Mr. GARAMENDI. But you don't want anybody looking over your shoulder?

Ms. GORDON-HAGERTY. No, sir. That is not the case whatsoever. In fact, we have the Defense Board staff.

Mr. GARAMENDI. But that is exactly what you are doing by limiting their authority and their opportunity to inspect the various facilities.

Ms. GORDON-HAGERTY. I would respectfully—

Mr. GARAMENDI. You are limiting their authority and their ability to oversee your work. Why do you want to do that?

Ms. GORDON-HAGERTY. I would respectfully disagree. We absolutely do not. We welcome the opportunity to work with the Board. We continue to work with the Board closely on every single opportunity where it is appropriate.

Mr. GARAMENDI. Do you agree with the Board's assessment that your letter and your order is contrary to law?

Ms. GORDON-HAGERTY. No, sir. I do not.

Mr. GARAMENDI. Why do you think it is not contrary to law?

Ms. GORDON-HAGERTY. Because we believe that the Atomic Energy Act expressly states what the roles and responsibilities of the Department of Energy is.

Mr. GARAMENDI. Mr. Hamilton, why do you think it is contrary to law?

Mr. HAMILTON. There are four specific things in the order that I believe are contrary to a plain reading of the Atomic Energy Act, and the bulk of the order is non-controversial and I agree with Administrator Gordon-Hagerty. I would also say that we have had three hearings on this topic, and we have heard from the Department of Energy that they don't intend to use these restrictions, but they are in the order and let me tell you what they are.

The first one—

Mr. GARAMENDI. Excuse me, did I hear you correctly, they tell you they do not intend to use the restrictions, but they are in the order, is that what you said?

Mr. HAMILTON. That is correct.

Mr. GARAMENDI. Okay, please continue.

Mr. HAMILTON. And that is a matter of public record, we have those in hearings. The four items that are in my view offensive to the Atomic Energy Act are—the first one, which exempts DNSFB oversight from hazard category three in radiological facilities. Hazard category three in radiological facilities are something that the Department of Energy defines; they are not in the Atomic Energy Act.

Secondly, the order claims to exempt the Board's oversight in situations where the Department of Energy determines that the adequate protection of the public health and safety is not adversely affected.

Mr. GARAMENDI. So they are watching themselves.

Mr. HAMILTON. That is a specious and circular argument because the Atomic Energy Act gives the Board that responsibility.

Third, the order directs the Department of Energy employees cooperate with DNSFB and provide the DNSFB with ready access to facilities, personnel, and information as necessary to carry out its statutory responsibilities. The language in the order leaves out the words, "as the Board considers." Again, it is allowing the Department to determine where we can look.

And lastly, the one I already mentioned in my opening oral remarks, about site boundaries. Those four items are the ones that we object to.

Mr. GARAMENDI. I haven't been around forever on this issue, but the years I have been around, the Board has brought to our attention significant lapses within the NNSA and I am very, very concerned about this limitation on the ability of the Board to review the work of the NNSA in its entire operation. So I will let it go with that. In my remaining 45 seconds, back to the 80 pits. You said that the 80 pits are required by the Department of Defense [DOD], is that correct?

Ms. GORDON-HAGERTY. Correct.

Mr. GARAMENDI. For what purpose?

Ms. GORDON-HAGERTY. To maintain and modernize the current nuclear weapons.

Mr. GARAMENDI. No. Specifically, for what weapons, for what delivery systems?

Ms. GORDON-HAGERTY. For currently the W87-1 which is the 78 replacement and for a number of other systems that we are working on right now. So it is specifically the 87-1, which has an FPU [first production unit] of 2030 that we have to produce the pits for that weapon system.

Mr. GARAMENDI. And how many for that purpose?

Ms. GORDON-HAGERTY. That number is classified, but I am happy to go into a closed session with you and explain and have DOD with me.

Mr. GARAMENDI. I would be happy to learn specifically all the way down why you need 80 per year; as simply noted in my seconds that are gone, that this number has expanded over the years without a clear explanation of why the number has expanded. I would appreciate a clear, fulsome explanation. I yield back.

Ms. GORDON-HAGERTY. I look forward to that. Thank you.

Mr. COOPER. Mr. Brooks.

Mr. CARBAJAL. Thank you, Mr. Chair.

Ms. Gordon-Hagerty, the budget for NNSA's international nuclear security program which is most responsible for supporting security upgrades around the world is at its lowest levels since its nascent days in the 1990s. What could you do with \$80 million more, \$80 million more in funding for programs to secure nuclear material around the globe?

Ms. GORDON-HAGERTY. Eighty million dollars is a specific number, but I will take \$80 million to secure more nuclear materials around the world, because that is nuclear materials that are less likely to fall in the hands of terrorists or adversaries.

Mr. CARBAJAL. Yes. But what else can you do with it?

Ms. GORDON-HAGERTY. There are opportunities we can undertake. We can secure additional blood irradiators, some Cesium sources where we are doing change outs with different hospitals and medical-care facilities that do blood irradiation. We can take those materials off the street and help facilitate the removal of those potential radiological dispersal devices.

We can do additional training around the world. We can encourage others and help them with security installations. There are a number of different things we can do around the world.

Mr. CARBAJAL. Thank you.

Ms. Gordon-Hagerty, new technologies are reducing the footprint and the detectability of proliferators in their attempts to acquire nuclear and radiological weapons.

What type of technologies such as 3D printing worry you the most? How can NNSA and other agencies work together to combat these new threats?

Ms. GORDON-HAGERTY. 3D printing is, in fact, one of our biggest concerns as well as other things associated with electronic signatures and some other issues. And we can talk about those in a classified environment, too.

We are working very closely with our interagency partners because of course the foundation of the NNSA enterprise is where most of the laboratories and plants throughout the NNSA enterprise is where the Department of Defense and the intelligence communities come for the technical expertise resident in our labs, plants, and sites and throughout the Department of Energy.

So we have a very robust program with them. And again, 3D printing and some other efforts are very alarming. And because they are available publicly, they present us with some challenges. So therefore what we are trying to do is also develop counter-measures against different types of challenges that we are encountering.

Mr. CARBAJAL. Thank you. And lastly, in today's world where the cooperation with Russia on nuclear security is difficult, what is NNSA doing to ensure we do not backtrack on global progress in nuclear security and counterterrorism since the advent of the Nunn-Lugar Cooperative Threat Program of the 1990s?

What new thinking or initiatives are you considering nationally, bilaterally, or multilaterally to build on past progress and focus on new threats?

Ms. GORDON-HAGERTY. We have made a great deal of progress since the 1990s with the Nunn-Lugar initiatives. However, we are limited in our interactions with our Russian counterparts, but we do continue to have technical exchanges with them. And if and when the situation presents itself, we will also continue to do things just as you described like the material security, ensuring that they continue with robust programs that we have helped them initiate and put into place.

At the present time, however, we are limited with the kinds of cooperations that we can undertake on a bilateral or multilateral position with the Russians.

Mr. CARBAJAL. So are you saying there is really limited initiatives that—

Ms. GORDON-HAGERTY. At the present time, we are limited in our cooperation with them.

Mr. CARBAJAL. Thank you very much.

Mr. Chair, I yield back.

Ms. GORDON-HAGERTY. Thank you.

Mr. COOPER. Thank the gentleman.

Mr. DesJarlais.

Dr. DESJARLAIS. Thank you, Chairman Cooper and I thank the witnesses for being here today. Special thanks to our guests from Tennessee who made the trip up. I appreciate your expertise and for you being here.

Ms. Gordon-Hagerty, you touched upon quite a bit of this in your opening statement, but I want to give you a chance to expand your testimony if you desire. What is included in this year's budget request for Y-12 specifically regarding the uranium production facility and investment in lithium production?

Ms. GORDON-HAGERTY. Our present request for the Y-12 complex is \$1.9 billion and that will be to continue operations mostly in canned subassemblies and the uranium work that is undertaken exclusively at Y-12.

With regard to our request for additional resources for the UPF, or the Uranium Processing Facility, that program has expended \$2.5 billion of a planned, projected \$6.5 billion budget.

We are requesting \$795 million for that request this year to continue construction. And I am glad to say that yesterday I was at Y-12, and I walked the site itself and we started the nuclear construction, the actual activities of the actual process building.

So I was actually on the site yesterday, looking at the facility and continuing with and seeing the great progress that our team is making there. And we have got some other monies and resources going into the efforts that they provide in nonproliferation, counterproliferation, counterterrorism.

Dr. DESJARLAIS. Okay. So having just been there, you are pretty confident that the UPF program will get completed on time and on budget?

Ms. GORDON-HAGERTY. Yes.

Dr. DESJARLAIS. Okay. What are the biggest risks to finishing the program?

Ms. GORDON-HAGERTY. The biggest risk there are actually the current and sustained funding that we require to, in order to be able to accomplish this and complete this mission. So it is really about the sustained funding that is necessary for us to complete this huge operation.

Dr. DESJARLAIS. Thank you. What is the NNSA doing to support increasing the capacity for tritium production?

Ms. GORDON-HAGERTY. We are undertaking a program at the Savannah River Site to complete the tritium finishing facility, for which we are asking for, requesting \$27 million for modernization and recapitalization of that facility.

The tritium—tritium, a vital component in our nuclear weapon systems, decays as—radiologically decays, radioactively decays 5.7 percent per year. And so, therefore, we need to refurbish and to update the limited life components in our nuclear weapons. And in order to do so, in the weapons that we are retiring or modifying or bringing back for surveillance, we'll change out those, recapture the tritium, and then also produce new tritium.

We are doing that also with TVA [Tennessee Valley Authority]. And we have a great relationship with TVA which is running our tritium bars, at which point they will irradiate the tritium bars. We will bring them back to the Savannah River Site. They will ex-

tract the tritium. We will process the tritium and then take it to Y-12, where they will be inserted into the weapons.

Dr. DESJARLAIS. Okay. Similar to Rep. Wilson's questioning earlier, I also have concerns about how NNSA is attracting and maintaining and growing the entire range of skilled workers necessary for NNSA's mission.

Can you explain what kind of workers you need to ensure the viability of the mission back home in Tennessee? Are they all nuclear physicists? Or are they welders, machinists, et cetera?

Ms. GORDON-HAGERTY. Yes, sir. They are all of the above. They are welders. They are machinists. They are wrench turners. They are project analysts. They are project managers. They are secondary designers, so they are weapons physicists. They are scientists. They are engineers. They are across the board.

And that is not exclusive to Y-12 or Savannah River. It is at every one of our labs, plants, and sites. And like I said, we have undertaken an aggressive hiring strategy, not only for near term but for long term, for the next 20, 30, 50 years. We need to build the workforce of the future now.

Dr. DESJARLAIS. Right. Thank you for your testimony.

And, Mr. Chairman, I yield back.

Mr. COOPER. I thank the gentleman.

Ms. Horn.

Ms. HORN. Thank you, Mr. Chairman. Thank you, all.

Chairman Hamilton, I want to circle back to the DOE's recent Order 1401, I have some more questions around that. In your testimony and subsequent questions, you have noted that this order substantially circumscribes the Board's ability to do your legally mandated safety oversight of the nuclear complex.

My first question is, do you believe that your concerns which you have articulated here have been taken into consideration by the Department?

Mr. HAMILTON. We have had three hearings and provided two direct letters of correspondence to the Secretary of Energy on this topic. We received one letter back after this first letter.

And so we have dialogue ongoing. I believe, though I don't know and perhaps one of the other panelists might be able to answer the question, I believe that there is an annual first year review of that order coming up.

And I am hopeful, although I don't know this in fact, that that will be the opportunity to correct what I see are those four egregious statements in the order. I am out—

Ms. HORN. So I take it by that last part of your statement that you think the DOE might reconsider those sections of the proposal?

Mr. HAMILTON. I am hopeful they will. We have certainly made it clear what we object to, those things I just listed. And we have made that crystal clear. I know that they are coming up with the annual review and again, I don't know that they are going to fix it, but this will be a natural opportunity to fix it.

Ms. HORN. So if it is not changed, if these concerns are not addressed, what risks and impacts to the safety and oversight of NNSA programs do you foresee if these aren't addressed?

Mr. HAMILTON. That is a great question. Thank you. I see actually very little direct risk to having our ability to access facilities

and information and people, because I do not fall under DOE orders. I fall under the Atomic Energy Act as amended. And the tools in the Atomic Energy Act including recommendation tools, advice letters, subpoena powers, hearing powers, all of those tools I have, and specifically the statutory right to ask for reports from the Department of Energy.

I have all those tools in my statutory tool kit. The concern is not that I can't get access from information, for information. The concern is that I may have to use some of those more tough tools, which slows down the process.

Ms. HORN. Understood. Following on related but not directly to the budget and the resources that are needed to conduct this critical oversight that the Board performs. From last year's notes in the budget request, you talked about maintaining the workforce at approximately 100 full-time employees.

And it appears to be similar to last year's, the proposal to cut the workforce by a third; and given the ramp-up of activity, I would like to know how you justify this decrease in the planned workforce from the previous year's budget request given the increased ramp-up in activity.

Mr. HAMILTON. The increased ramp-up of activity is I think and particularly the amount of budget, increased budget the Department has and NNSA specifically has, is counterintuitive. The money that is being spent is for higher quality facilities, replacing old Manhattan Project era buildings that are crumbling, adding new equipment that is of higher technical capability.

So all of those things that the Department is spending money on are actually enhancing what is already a very safe set of facilities. So I see that as actually counterintuitive. The more money that the Department is spending on enhancing facilities and modernizing them actually makes my job easier.

Ms. HORN. And just one final question as my time is about to expire. In this oversight, if you are saying that it makes it easier; do your concerns with the Order 140 remain if it stays as it is?

Mr. HAMILTON. My concern with DOE Order 140.1 is not so much that it will limit my ability to do my job. It will slow my ability a little bit. But I have the statutory tools to plow through that if I have to.

My real concern is that it is a, the wording, those four things that I talked about are a direct, in my view, a direct contradiction from the plain language of the Atomic Energy Act.

Ms. HORN. Yes.

Mr. HAMILTON. That is my real concern. I can get through this. It might slow me down a little bit but I have the statutory authority to get all that information.

Ms. HORN. Thank you. My time has expired. Thank you.

Mr. HAMILTON. Thank you for that question.

Mr. COOPER. Thanks.

Let us have a second round of questions. To follow up on what Mr. Hamilton was just saying, do your powers under the Atomic Energy Act include things like subpoena powers?

Mr. HAMILTON. Yes, sir.

Mr. COOPER. That's impressive. Good. Glad to know that. I didn't know that.

Mr. HAMILTON. We try not to use it.

Mr. COOPER. Yes. It is much better to be friendly. Now, I would like to do a quick shout-out for Naval Reactors. I don't know a part of NNSA or government that does more more efficiently or complains less.

And for them to even be happy now with a slight budget cut is pretty awesome. I hope all the government agencies can learn from that.

Next, regarding A10 filings under the export compliance assistance program, I wanted to ask Ms. Gordon-Hagerty when the subcommittee can get access to those filings.

Ms. GORDON-HAGERTY. The Department is moving aggressively to provide that information, and I guarantee you that it will be done in the very near term, so, and then that is what the team is actually pulling together.

I believe that some of the staff have already been briefed on the part A10s to date, but we will be providing and being very responsive, as responsive as we can be to the committee.

Mr. COOPER. I was also wondering if you had any opportunity to check the beneficial ownership of any of the entities that were involved in those filings.

Ms. GORDON-HAGERTY. Yes, I have made that request. And the lawyers are looking at that right now, as we discussed they are, and I take your point and we are looking into it right now.

Mr. COOPER. Right. Then, Ms. White, you were talking about thrift and saving money, cutting Hanford and how that needed to be done but I noted there was an increase at Savannah River. Why is that \$90 million increase necessary?

Secretary WHITE. So as you are well aware, the budget process is a process. We also have a big increase in our production rate of treating tank waste out of Savannah River due to the fact that our new treatment facility SWPF [Salt Waste Processing Facility] will be coming online.

Mr. COOPER. So that is the reason for the \$90 million.

Secretary WHITE. Yes. And what that ultimately does is that it will greatly increase the rate at which we can remove that waste from those tanks, which ultimately decreases overall baseline.

Thanks.

Mr. COOPER. Unless Ms. Davis would like to ask a question right here. You are welcome to.

Mrs. DAVIS. Okay. Thank you, Mr. Chairman. Sir, I am doing double-duty back and forth there. Unless this is, has already been asked, but I wanted to thank you, all, of course, for being here.

And anyone can add on to this question. If New START [Strategic Arms Reduction Treaty] is not extended in 2021 and Russia started building past the limits of the treaty, how would this impact the requirements, the schedule, and the cost for NNSA's nuclear modernization efforts, Ms. Gordon-Hagerty.

Ms. GORDON-HAGERTY. At the present time, we are supporting New START and will continue to do so and at some point in the future decision were made whether or not we are going to continue with New START.

That said, I would say that it is not possible to actually determine what the modernization costs would be if we chose to increase

our nuclear weapon stockpile, which is not in discussion at the present time.

I would also defer, I guess, respectfully to the Department of Defense to find out what, if any, requirements they are considering.

Mrs. DAVIS. Thank you. If I could then go to your testimony where you were arguing that the W76-2 low-yield nuclear weapon gives the U.S. a credible response option and deters adversaries who might think the U.S. would be deterred from responding to a low-level nuclear attack.

I think that this type of language actually, the low-level nuclear attack, suggests that the United States does not have credible response options. I don't find that terribly helpful. And I really wonder whether it could be interpreted in a way that is far more dangerous.

Senior administration officials should not use this type of language. It weakens the credibility of the U.S. deterrent. There are low-yield weapons no doubt, but they are not low-level nuclear attacks.

So, I hope that if you would like to respond to that. General Hyten said before this committee last month that he is "ready to respond to any threat, anywhere."

So, can you define for me what you believe a low-level nuclear attack would be? Is there a threshold of nuclear attack at which you believe the current stockpile is not credible, as your testimony suggests?

And can you describe how existing non-strategic nuclear weapons in the U.S. arsenal impact the existing credibility? In other words, are the B61 and ALCM [Air-Launched Cruise Missile] credible?

Ms. GORDON-HAGERTY. All of our nuclear weapons in our existing stockpile are credible based on different threat scenarios. However, the use of or the insertion of a low-yield ballistic missile, the W76-2, provides the Department of Defense and the President with a diverse type of capabilities against potential adversaries.

And that is the reason why and the rationale behind the introduction, or I should say the reintroduction of a low-yield ballistic missile. We have had them in our stockpile in the past and we presently have them.

This provides the Navy with the use of a submarine-launched ballistic missile, a capability that we don't currently have.

Mrs. DAVIS. Could you go back just to my first question about what you believe a low-level nuclear attack would be.

Ms. GORDON-HAGERTY. I think I would defer to the Department of Defense on what describes a low-yield nuclear attack.

Mrs. DAVIS. Low-level.

Ms. GORDON-HAGERTY. Low-level nuclear attack. In terms of the escalate to de-escalate, that is where the, an adversary perhaps attacks us and doesn't think that we have a capability to attack on a lower level, or if you will, or with low-yield in-kind nuclear weapons.

But that is not a scenario that we envision now that we have, we will be reintroducing the W76-2 into the stockpile. It provides the Department of Defense with different capabilities that we didn't necessarily have.

Mrs. DAVIS. Yes. I think what is difficult here is that if we were to make clear to our adversaries that there is no such thing as a low-level nuclear attack as was stated here and it seems as if the—our allies would certainly read that as enormously as escalatory and respond to us on that very basis if we think that is where we are starting.

So, I guess going back to is there a threshold of nuclear attack of which you believe the current stockpile is not credible as your testimony suggests?

Ms. GORDON-HAGERTY. As I have suggested, based on the Nuclear Posture Review, the reintroduction of a low-yield ballistic missile into the stockpile will provide us with credibility and a robust nuclear deterrent not only for the United States but for our friends and our allies.

Mrs. DAVIS. And what would you call the next level after low, what would you call the next level?

Ms. GORDON-HAGERTY. Deterrence.

Mrs. DAVIS. Thank you.

Mr. COOPER. Does the ranking member have an additional question?

Mr. TURNER. Yes. Thank you. So from low-yield nuclear weapons, I am changing the topic to nuclear reactor, so I want to make sure that it is not confused.

So, on nuclear reactors, low-enriched nuclear capacity for nuclear, for naval reactors, could you speak about that for a moment, Ms. Gordon-Hagerty—benefits, pros, cons, cost, and the like.

Ms. GORDON-HAGERTY. So to the extent that we would be using, I am presuming you are referring to low-enriched uranium.

Mr. TURNER. Low-enriched uranium.

Ms. GORDON-HAGERTY. We have continued to study the capabilities to consider for naval reactors low-enriched uranium fuel. Highly enriched uranium provides us with military advantage.

I defer to Admiral Caldwell, the Deputy Administrator for Naval Reactors, that can speak more to the complexities about using low-enriched uranium vice high-enriched uranium.

Mr. TURNER. Thanks for that, and I apologize for the transition of low and low because they are very, very different topics, but thank you.

Admiral CALDWELL. Yes, sir. Again, James Caldwell, Director of Naval Reactors.

Sir, we have a long history of using highly enriched uranium in our program. It has allowed us to build reactor cores that have long lives.

In fact, today, our aircraft carriers are refueled about the 23-, 25-year point and then last for a total of 50 years. All the submarines we are building today have life-of-the-ship reactors.

Everything we do in our program is designed around the use of highly enriched uranium, from the design of the core to the procedures for defueling and refueling, to the procedures for shipment and the procedures for packaging.

Low-enriched uranium would be a completely different approach. Essentially, it would mean you would be loading less energy into a reactor core, which means that you would have either, you would have to refuel the vessel more frequently or have a larger reactor

so you could load more energy into that core, or potentially you have to build more ships to be able to achieve the same amount of deployed operations that you have today.

In 2018, the Secretary of Energy and Secretary of the Navy signed a joint letter determining that we should not pursue a low-enriched uranium core for naval applications.

Mr. TURNER. Is there an issue with the aggregate of waste produced, even though the waste would have different—

Admiral CALDWELL. The waste would have different characteristics and we would have to deal with that. We would have to engineer that. And that would require some change. The real issue is whether you are not able to load the amount of energy in the core and the same configuration and get the same amount of lifespan out of it.

So you would have to make significant additional investments in refueling reactor plants to keep that ship operating for longer periods of time. The cost to go after a program to develop such a capability, we determined that in a 2016 study, directed study that said it would be about a \$1 billion and it would take 10 to 15 years to just develop that capability.

That does not include the amount of money it would take to deploy, in other words to actually build the reactor and tune all of those systems I talked about from refueling, to transport, to storage. And that could be literally billions of dollars on top of that.

Mr. TURNER. Thank you for the clarification.

I yield back.

Mr. COOPER. I am not certain if Mr. Wilson, Mr. Garamendi?

Mr. GARAMENDI. I want to go back to the pit production. Perhaps this would have to be done in a classified setting. But it was argued earlier that the pits were required for a new nuclear weapon, the IW2.

That is no longer in play, I understand, instead we are now building new pits for the W78. Is that correct?

Ms. GORDON-HAGERTY. Yes, that is correct. And that is based on the fact that we have seen plutonium aging. There are systems in the current 78 that don't lend itself to a life extension program as we have traditionally done, such as with the 76-1 that we have just completed.

So in order to ensure that we can extend the life of that required system, we are going to use the current 87 and turn it into an 87-1, which will be the, what we are calling the 78 replacement, which is the 87-1.

In order to do so, it will provide us with the more robust system. These are not new nuclear weapons. They are just modernizing our existing nuclear weapons.

Mr. GARAMENDI. Well, that could be debated, but not particularly useful at this moment. What is that new, excuse me, modernized nuclear weapon for?

Ms. GORDON-HAGERTY. It is for the 78 replacement for the system for the Ground-Based, the GBSD, the Ground-Based Strategic [Deterrent].

Mr. GARAMENDI. For the new multi-, tens-of-billion-dollar ground-based replacement for the Minuteman II and III.

Ms. GORDON-HAGERTY. Minuteman III.

Mr. GARAMENDI. What is the total cost of that?

Ms. GORDON-HAGERTY. That program will be, do you have total lifecycle cost, Charlie?

One second.

Mr. GARAMENDI. Added that you are not responsible for the missiles or the missile silos or the command and control system and all the rest.

Ms. GORDON-HAGERTY. No, sir.

Mr. GARAMENDI. What is the cost of the W78 replacement which I guess we now call the W87-1?

Ms. GORDON-HAGERTY. W87-1 modernization program, this year we are requesting \$112 million for a total of—Charlie, you want to come up to the table?

This is Dr. Verdon, if I may. Dr. Verdon is the Deputy Director for—Deputy Administrator for Defense Programs.

Mr. VERDON. So right now, sir, it is in its very early stages. We have a range of designs that the cost would range from \$12 billion to an upper end of \$15 billion, but that we will be backing down and choosing the options that we actually implement on it right now.

Mr. GARAMENDI. So we are really starting on something new here even though it is not a new weapon, it is a replacement weapon, a modernized weapon, but yet it is new.

Mr. VERDON. It is a modification to the Legacy 87 system.

Mr. GARAMENDI. Oh, we're the ones that play games with words [inaudible].

Mr. VERDON. No. That is officially what it is—it is called modification because it is based on the Legacy 87 system.

Mr. GARAMENDI. Okay. We won't get any further on that one. The Savannah River plutonium program is in abeyance. The disposition of the plutonium at Savannah River is in abeyance, it is not moving forward, is that correct?

Ms. GORDON-HAGERTY. That would be the MOX facility, yes. That was terminated on May 10th of 2018.

Mr. GARAMENDI. And what is the plan for the disposition of the—

Ms. GORDON-HAGERTY. The planned path forward is to use what we call our surplus plutonium disposition plan, which will cost much less than the planned MOX facility, in fact, much less, 40 percent of the total cost and it will be faster, cheaper, and quicker, more safe to remove the 34 metric tons of excess plutonium.

Mr. GARAMENDI. And what is that?

Ms. GORDON-HAGERTY. Total lifecycle cost is \$18 billion over the entire life cycle.

Mr. GARAMENDI. And what is it that you are doing?

Ms. GORDON-HAGERTY. It is actually taking the materials. It is a very simple process actually. You are taking the plutonium waste, mixing it with a material where it cannot be reused, and then we will permanently place it at WIPP, at the Waste Isolation Pilot Plant.

Mr. GARAMENDI. Use your language correctly.

Ms. GORDON-HAGERTY. I am sorry.

Mr. GARAMENDI. Carefully. You are spiking it so that it cannot be used as a weapon, is that correct?

Ms. GORDON-HAGERTY. Yes, sir, so that we cannot—no longer use it.

Mr. GARAMENDI. But can it be reprocessed? The answer is yes, it can. And how will you then ultimately dispose of this spiked plutonium?

Ms. GORDON-HAGERTY. This material will be emplaced at the Waste Isolation Pilot Plant at—in New Mexico.

Mr. GARAMENDI. Retrievable? Yes.

Ms. GORDON-HAGERTY. It is put in salt in—1,950 feet below ground in salt caverns.

Mr. GARAMENDI. In a facility that has had some problems. Yes, it has had some problems. So you are spiking it, you are putting it in the WIPP facility, and there it sits.

Ms. GORDON-HAGERTY. Yes, sir, like—

Mr. GARAMENDI. Okay. Why are you not using any of the 34 tons of plutonium that now exist? And why are you then developing new pits?

Ms. GORDON-HAGERTY. Sir, we are using our materials for defense-related needs for the pits, for the remanufactured pits for the 87 program. So that is actually what we are doing when we are making these not less than 80 pits per year.

We are actually using some of defense programs material that we have set aside. In fact, the half a metric ton that is currently staged at the Nevada National Security Site will ultimately make its way to Los Alamos for use in the 87 pits.

Mr. GARAMENDI. Thank you. I see I am past my time. Thank you.

Mr. COOPER. Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman.

And, again, what is your assessment of the need to repurpose the MOX facility for the plutonium pit production?

Ms. GORDON-HAGERTY. The Department of Defense and the Nuclear Weapons Council stated that the Department of Defense requirements are for not less than 80 pits per year beginning in 2030. And at which point several years ago, we conducted an analysis of alternatives, and then eventually followed on by an engineering assessment that stated the different approaches under which we could produce that not less than 80 pits per year were several options. We skinned those down to approximately four options of which three were at the Los Alamos National Laboratory which would undertake significant resources to be—to build out additional facilities there. Or because we were approaching the plan to terminate the MOX facility, we could repurpose that partially constructed facility which we thought was the most appropriate way to go. It would also provide us with a resilient and redundant capability, a capability that we have not had in this United States since the late 1980s, early 1990s.

Mr. WILSON. And so the justification for the two-pronged approach is, you feel, very clear.

Ms. GORDON-HAGERTY. Very clear that clearly our United States needs a redundant and resilient capability for future nuclear weapons stockpile requirements. And the time is long past that we have maintained—that we retain or obtain a capability to produce nuclear weapon pits. And doing it at Los Alamos will not get us to achieve, to the required 80 pits per year.

Mr. WILSON. And you've done the cost analysis of Los Alamos, Savannah River Site, as to not have a two-pronged approach?

Ms. GORDON-HAGERTY. Yes, sir, we have. And we will not meet the, it is challenging as it is. Let us be frank, 2030 is only 11 years away. And that is challenging in and of itself.

To try to then identify other needs and start to build new facilities and additional facilities to our current operations at Los Alamos while we are maintaining or getting to a place where we will be producing 30 pits per year in perpetuity starting in 2026 makes it even more challenging. And we will not be able to get to that 80 pits per year required by the Nuclear Weapons Council.

Mr. WILSON. And I appreciate your clarity on this.

And, Ms. White, thank you for including in the budget the funding to the Advanced Manufacturing Collaborative [AMC] to be located very likely at the University of South Carolina Aiken.

The AMC will not only allow experts in emerging technologies to collaborate with industry, academia, and government to improve the manufacturing, but also assist the DOE complex by accelerating technology development for the cleanup mission.

Can you comment on the importance of this facility and the success of similar facilities across the DOE complex?

Secretary WHITE. Yes. So the AMC project is very exciting and it is allowing us to make some investments in Savannah River National Lab, which will be very important, that is EM's only lab and EM operates it. And also too, when I looked at some of mock-ups at that facility, one thing that I think will be very important about its future is that is exactly the kind of facility that is going to attract next-generation workers. And there is going to be, I believe, a lot of excitement around it and that is something we need in EM just as in NNSA.

Mr. WILSON. Thank you. I yield back the balance of my time.

Mr. COOPER. I thank the gentleman.

I wanted to ask Mr. Hamilton quickly. On page 5 of your testimony, you talk about four waste drums at the Idaho National Laboratory that underwent over-pressurization, ejecting their lids and spreading radiological waste. You go ahead and call it the potential for a deflagration, a word I have never heard of before.

It would seem like by 2018, we should know how to store nuclear wastes. I know WIPP had a problem with the kitty litter, organic versus inorganic.

But why can't we get this right?

Mr. HAMILTON. Thank you, Mr. Chairman. The four drums that you are talking about at the Idaho Advanced Retrieval Project that essentially exploded and were inside of a containment, was a near miss. The building that it was inside was not occupied at the time because it happened at night. So there was some degree of luck that nobody was there to get hurt.

The specific answer to your question is, all of that waste that is in those fields, that came, most of that came from the decommissioning of the prior plutonium facility that we had in Colorado, Rocky Flats.

When that was done, there were, what I would say is, marginal records kept of what was in which drums that were buried. And so there is some degree of uncertainty in what is being dug up as

regards to what came from Rocky Flats and when it came. As best as can be done, the project uses the records they have, but it is not a perfect science.

One thing I will tell you, and this is why I am not personally losing a lot of sleep over this particular event, 90-plus percent of the drums that are being unearthed and reprocessed, over 90 percent are complete. This is the first event that occurred like this. So there is some risk in every operation that you are going to get a mix of the wrong things.

I will tell you that I personally am convinced that what Ms. White and her team have done to mitigate problems with future re-packaging is an appropriate and reasoned approach to prevent this happening.

We are actually having a hearing on this in May to probe a little bit more deeply and we have some of our top talent in our staff digging into some of the details; but it is a very complex mix of unknowns, and there is just some random opportunities in there for this kind of thing.

It is not a very satisfactory answer, but the reality is, like I said, 90-plus percent of this has been done. We haven't had an event. So we had this one event and they put the things in place, the process in place they think will mitigate it. And I think that—I think it will.

Did I answer your question, Mr. Chairman?

Mr. COOPER. Well, since in your response you used the word explosion and this involves nuclear waste, I don't think the public would find your answer to be very persuasive, because the folks I talk to back home want zero defect handling of nuclear material——

Mr. HAMILTON. Just——

Mr. COOPER. Zero——

Mr. HAMILTON [continuing]. For clarity, what happened was that there was material in those four drums that overheated and caused the lids of those drums, caused pressure inside the drums and caused those lids to pop open. And when that happened the material inside there came out into the space.

I call that an explosion but maybe that is a politically charged word that is not a good one to use, but it did pop out into that space.

Mr. COOPER. We are here to do the best possible job for the taxpayer and when it involves nuclear, that usually means zero defects. WIPP, as you know, was shut down for years as result of a mistake.

As I was saying, this is 2019, we should be able to get this right. There should be a process with quality controls in place so that no mistakes are made. Am I asking too much?

Mr. HAMILTON. My charter under the Atomic Energy Act and specifically under the legislative history is a recognition that zero risk is unattainable. That is in the history of the legislation that created my Board. So my approach to the adequate protection of the public health and safety is not zero risk. It is something approaching as good as we can get.

And it is a subjective term, but I am not chartered to establish zero risk. That is clear from my reading of the legislative history,

and I think the only way to have zero risk, Mr. Chairman, is not to do anything and that is certainly not an option. So there is risk involved in everything we do.

The question is, are we doing what is enough to adequately protect the public health and safety? And in my view, we are.

Mr. COOPER. I think the real answer is somewhere between the 90 percent figure that you mentioned in your response and 99.9999—

Mr. HAMILTON. My 90 percent was how much has been processed.

Mr. COOPER. Okay. Okay. Well, I think the public wants to see the best that we can possibly do is the best that can be done by human beings, that we are not trying to cover up our own inadequacies, that we are not hiding the ball, and I was just surprised reading this in your testimony.

I think your Board does an excellent job. We want to keep you in business. But I was just kind of struck, 2018, stuff like this happens.

Mr. HAMILTON. I don't think there has been any effort or intent to minimize this. As far as I am concerned—

Mr. COOPER. But what if WIPP gets shut down again for several years? You know, these are problems we—Ms. White, you have been itching to talk?

Secretary WHITE. Sorry, I just, we take these things very, very seriously in EM. And as someone who actually worked in the field and benefited from the safety culture throughout my career, I can assure you we take every effort to absolutely understand every piece and part of the process, and as Mr. Hamilton noted, it can never go to zero, although I really wish it could. And we—

Mr. COOPER. Yes. But we can solve the kitty litter problem. Like if inorganic kitty litter works, let us stick with that, not go with the organic kitty litter.

Secretary WHITE. Right. Yes. So we have very detailed information on both this event and our response to it. And I would be very, very happy to come and give a more detailed briefing, because I think you would find our efforts are substantial and we take these things very seriously.

Mr. COOPER. The ranking member.

Mr. TURNER. I just want to say, first off, thank you for all of the expertise that you guys bring to bear in all aspects of our review and decision making and discernment as to what paths we need to go in, how we need to correct what we are doing.

Ms. Gordon-Hagerty, you said your workforce, it is not just your testimony today, it is the workforce that stands behind you that goes to great lengths to ensure safety.

So having said that, I just want to say I absolutely agree with the chairman, there is no margin of error here.

Mr. Hamilton, I greatly appreciate your reality check of the statement of the mission that you have, and that in part we look to you guys to be ingenuity, to create, to invent. As you are looking to our safety, you have to invent ways to create that safety. So I—but at the same time, I commend you and I am great appreciative of what you are doing.

I must agree with the chairman here in that I think everybody views this as no margin of error even though that, Mr. Hamilton, I recognize is an impossible task.

So thank you all for trying to rise to that impossible task.

Mr. COOPER. Concluding note unless the ranking member has a response to this. Just look behind you, naval reactors, there is a problem on a submarine, people die. The Navy has done a superb job of making the risk as close to zero as any human being could possibly imagine. So why don't we follow that sterling example?

Mr. GARAMENDI, back in time for the third round of questions if you would like.

Mr. GARAMENDI. You were just raising the hammer.

Mr. COOPER. I was poised. The witnesses are hoping that I will hit the block.

Mr. TURNER. I am hoping that you will hit it.

Mr. GARAMENDI. I want to go back to the W87 and it is to be used as a replacement for the W78 for the new ground-based deterrence system.

Well, let me put it this way.

Has an AOA [analysis of alternatives] been conducted to determine that you need a new, excuse me, you used the word modified weapon to replace the W78 on what is essentially a missile for the same purpose. Has an AOA been done to determine that you need that?

Mr. VERDON. Yes, sir. An AOA has been done and it folded in both the military's requirements which were to improve the safety and security of the warhead, as well as NNSA's requirements which has an overarching whenever we get the opportunity to improve the safety and security.

It was also that the Air Force desire is to move to a single air shell fleet called the Mark 21. And so that was the warhead that emerged as to address the military's requirements both from STRATCOM and the Air Force as well as NNSA's requirements.

Mr. GARAMENDI. In the appropriate forum, I want to go into that in much more detail if you would. We will have that, I am sure, at some time in the future.

Also, my understanding is there never, never has been a low-yield warhead on an SSBN [ballistic missile] submarine.

Ms. GORDON-HAGERTY. That is correct.

Mr. GARAMENDI. That is correct.

Ms. GORDON-HAGERTY. That is correct. I think I stated that we had a low-yield—we had a low-yield weapon in our stockpile.

Mr. GARAMENDI. Yes, you do.

Ms. GORDON-HAGERTY. Yes.

Mr. GARAMENDI. It is the 21. However, there has never been a low-yield ballistic missile or warhead on an SSBN. Is that correct?

Ms. GORDON-HAGERTY. Yes, correct.

Mr. GARAMENDI. So this would be the first time.

Ms. GORDON-HAGERTY. Yes.

Mr. GARAMENDI. And that raises another set of questions for another day. I have kept you too long, Mr. Chairman, thank you.

Mr. COOPER. It looks like there will not be a fourth round of questions. Let the panelists rejoice. The hearing is adjourned.

[Whereupon, at 4:54 p.m., the subcommittee was adjourned.]

A P P E N D I X

APRIL 9, 2019

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

APRIL 9, 2019

Opening Statement of Rep. Jim Cooper
Subcommittee on Strategic Forces
April 9, 2019

Good afternoon. The Subcommittee will hear testimony on the Fiscal Year 2020 Budget Request for Atomic Energy Defense, Nonproliferation, Safety and Environmental Management.

Here today to testify are Administrator Lisa Gordon-Hagerty, Assistant Secretary Anne White, and Chairman Bruce Hamilton. We also have backup experts in the audience such as Admiral James Caldwell, Director of Naval Nuclear Reactors, Dr. Charles Verdon, Deputy Administrator for Defense Programs, and Brent Park, Deputy Administrator for Defense Nuclear Non-Proliferation, who may be called on to provide the subcommittee with their expertise. We are grateful for the service of all of you, and for your willingness to come before the Subcommittee today.

Our job today is to make sure that our nuclear weapons work, that our deterrent capability is “safe, secure, reliable, and effective,” that our plants are run safely, that past mistakes are cleaned up, and that the spread of nuclear weapons and capability in other countries is absolutely minimized. The Administration is asking for about \$23 billion to make sure all that happens.

The most expensive decision that the NNSA is about to make is whether to conduct “plutonium sustainment operations” in one or two locations. The life-cycle cost of two sites is roughly \$14 billion extra--almost the entire NNSA budget for a year--double the cost of a one-site solution. Although this decision has not been presented to Congress for a decision, I think that it should be because this is an extraordinary amount of money to spend on a redundant location. We are presented with a \$410 million request to “begin design work to repurpose the cancelled MOX facility into a pit production facility,” but that design request turns out to have a \$13.5 billion tail. That \$410 million is in addition to the \$220 million request to close the MOX facility, for a total of \$630 million to be spent on a plant that probably should have been shuttered five years ago. MOX is almost receiving more money today than it was when it was intended to be fully operational. MOX may be worth more dead than alive.

Forgive me for being suspicious when, in addition to this apparent favoritism to Savannah River, only that site is receiving additional funds for cleanup, an additional \$91 million, while Hanford is forced to take substantial cuts. For those of you keeping score at home, this is a total of \$720 million of additional funding for South Carolina, much of which is questionable unless you are sold on the two-site solution for “plutonium sustainment operations.”

Chairman Hamilton, your organization plays an important role in ensuring the Department of Energy maintains a safe and environmentally sound nuclear enterprise, both for workers as well as the broader public. I appreciate your testimony on how DOE’s recent Order 140.1 defines the word “public” to exclude

workers at the plant site and visitors. I look forward to discussing this more. Your testimony on the recent Board recommendations demonstrates that there is ample room for safety improvement throughout the nuclear complex, so it seems to be a bad time to diminish worker protections.

Now, let's hear from the Ranking Member, and then our witnesses.

Opening Remarks of Ranking Member Michael R. Turner
Subcommittee on Strategic Forces
Hearing on
Fiscal Year 2020 Priorities for Atomic Energy Defense, Nonproliferation,
Safety, and Environmental Management
April 9, 2019

Thank you Mr. Chairman. I would also like to extend a warm welcome to Ms. Gordon-Hagerty, Ms. White, and Mr. Hamilton. You all have a great deal of expertise in these important areas and I look forward to your testimony.

The President's Budget request for the Atomic Energy Defense Activities for Fiscal Year 2020 represents the continued commitment of this Administration to our nuclear modernization efforts. It recognizes the importance of the warhead life extensions, low-yield warhead development and production, and the continuing need to modernize our aging defense-related nuclear infrastructure. While we heard from the Department of Defense's nuclear experts two weeks ago, I recognize that the Department of Energy's efforts work hand-in-hand with the DoD's efforts. Both efforts must be fully funded to ensure an effective nuclear deterrent.

I'd like to discuss a few areas of this year's President's Budget Request that are particularly important to the oversight role of this subcommittee.

First, as Ms. Gordon Hagerty outlines in her written testimony there are a number of warhead life extensions, modifications, and alternations to the current nuclear stockpile that are on-going. These weapons activities are directly tied to the DoD's efforts to update the delivery platforms for these warheads, which we heard about two weeks ago from the Department of Defense. The reality is that the majority of weapons in today's stockpile have surpassed their intended design life and therefore are accumulating increased risk. There is no margin for slipping any of the funding for NNSA's Weapons Activities. Deferring funding for these programs is willfully endangering the ability of our nation to provide a credible nuclear deterrent.

Second, as documented in the Nuclear Posture Review released in 2018, this Administration has decided to field a small number of low-yield ballistic missile warheads in the near-term. The Administration is also pursuing the development of a low-yield submarine-launched cruise missile (SLCM). These capabilities will close the deterrence gap with our strategic competitors and provide additional assurance to our allies. Specifically, the low-yield capabilities will provide the United States with a timely and effective option to counter Russia's non-strategic nuclear weapons in an escalate-to-deescalate scenario. I understand that the warhead development for the low-yield ballistic missile, called the W76-2, is progressing quickly. I look forward to an update on where we are with the W76-2 and future efforts regarding the low-yield SLCM. This is really a study in how efficiently our country can move forward to address critical nuclear deterrence requirements when political will is matched with appropriate resources. And I'd

like to thank the NNSA for their hard work on this program.

Lastly, as Gen Hyten noted in his testimony before this committee two weeks ago the highest NNSA infrastructure priority is re-establishing a plutonium pit production to meet deterrent requirements. Our national requirement, requires no fewer than 80 war-reserve pits per year by 2030. I support the NNSA plan to achieve this. Plutonium pit production will continue to be a critically important part of the nuclear modernization efforts of this nation. The plans for plutonium pit production by 2030 are ambitious, they are also absolutely necessary for our nuclear enterprise—and so is the funding. The reality is that in many cases the infrastructure where our nuclear weapons are produced date back to the Manhattan Project. Creating the infrastructure to meet the defense requirements for uranium, plutonium, lithium, and tritium are a necessary foundation for our nuclear modernization. I look forward to hearing about how the Department of Energy is investing in this critical capability.

To the witnesses thank you again for being with us today and I look forward to your testimony.

**Testimony Statement of
The Honorable Lisa E. Gordon-Hagerty
Under Secretary for Nuclear Security
and Administrator of the
National Nuclear Security Administration
U.S. Department of Energy
Before the
Subcommittee on Strategic Forces
House Committee on Armed Services**

April 9, 2019

Chairman Cooper, Ranking Member Turner, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year (FY) 2020 budget request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA appreciates the Committee's strong support for our nuclear security mission and for the workforce and organizations that are responsible for executing it every day.

NNSA's enduring missions are to protect our Nation by maintaining a safe, secure, and effective nuclear weapons stockpile, reducing global nuclear threats, and providing the United States (U.S.) Navy's submarines and aircraft carriers with militarily effective nuclear propulsion. NNSA has numerous strategic partners that enable, contribute to, and benefit from our efforts, yet no other government or civilian organization can accomplish our unique mission on behalf of the American people.

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. While the ultimate goal of eliminating nuclear weapons has been an aspiration for generations, we must recognize the reality that foreign nuclear threats are growing. It is imperative that we modernize the U.S. nuclear deterrent and enterprise; our credibility assures our friends and allies and deters those who wish us harm.

Thanks to continued strong support from this Administration and Congress, NNSA is transforming the nuclear security enterprise to be more responsive and resilient. The following highlights: (1) NNSA's accomplishments in calendar year 2018; (2) the budget request for NNSA; (3) Weapons Activities Appropriation; (4) Defense Nuclear Nonproliferation Appropriation; (5) Naval Reactors Appropriation; and (6) NNSA Federal Salaries and Expenses Appropriation.

NNSA's Accomplishments in Calendar Year 2018

Plutonium Pit Production: The highest NNSA infrastructure priority is re-establishing a plutonium pit production and fabrication capability to meet the Department of Defense's (DoD) military requirements. Our national requirement, supported by numerous studies and analyses, requires no fewer than 80 war-reserve pits per year by 2030. Last May, the Nuclear Weapons Council (NWC) endorsed NNSA's recommended alternative calling for plutonium pit production

at Los Alamos National Laboratory (LANL) and the Savannah River Site (SRS). This two-site approach bolsters the nuclear security enterprise's responsiveness and resiliency.

NNSA's Life Extension Programs (LEPs), Modifications, and Alteration: In January 2019, NNSA completed the program of record for the W76-1 LEP, extending the warhead's service life from 20 years to 60 years. The B61-12 LEP, W80-4 LEP, W88 Alteration 370, W87-1 Modification, and the W76-2 Modification continue to remain on budget and schedule. These achievements are a testament to NNSA's ability to deliver on our commitments we have made to DoD and Congress.

Infrastructure Investments: NNSA commenced construction of the main buildings of the Uranium Processing Facility (UPF) at the Y-12 National Security Complex (Y-12). UPF remains on budget and on schedule for delivery by the end of 2025 for no more than \$6.5 billion. NNSA also broke ground on the new Albuquerque Complex, which will house 1,200 employees when complete.

Highly Enriched Uranium (HEU): Working with the International Atomic Energy Agency (IAEA), China, and Nigeria, NNSA was instrumental in the conversion of a Nigerian research reactor from HEU to low-enriched uranium (LEU) fuel. This marks NNSA's 74th research reactor or isotope production facility conversion, which was followed by repatriation of the HEU fuel to China, making Nigeria the 33rd country plus Taiwan to become HEU free.

Nuclear Material Removal: NNSA removed or confirmed disposition of more than 280 kilograms of HEU from four countries, enough material for more than 11 nuclear weapons.

Counterterrorism: NNSA's technical experts were deployed to numerous widely attended public events such as the Super Bowl and the Boston Marathon to provide radiation detection, identification, and technical advice, helping to protect the public from acts of nuclear and radiological terrorism. This level of support requires NNSA's response assets to maintain full operational readiness at all times.

Naval Nuclear Propulsion: NNSA's Office of Naval Reactors continued its record of safe and reliable nuclear propulsion and nuclear fleet support, while contributing expertise to the U.S. Navy's new Columbia-Class program. This next generation nuclear-powered submarine will ensure required sea-based deterrence capabilities for decades to come.

Supercomputing: Lawrence Livermore National Laboratory (LLNL) unveiled the Sierra supercomputer, ranked the second-fastest in the world according to the Top 500 list.

For more than 70 years, from the early days of the Manhattan Project to the height of the Cold War, the dedicated men and women of the nuclear security enterprise have overcome every obstacle in their way, all while accomplishing a complex and enduring national security mission. With Congress' continued support, NNSA will similarly overcome the nuclear security threats that face us today and into the future.

NNSA's FY 2020 Budget Request

The 2018 Nuclear Posture Review (2018 NPR) calls for the United States to have modern, flexible, and resilient nuclear capabilities that are safe and secure until such a time as nuclear weapons can prudently be eliminated from the world. All previous NPRs highlighted the need to maintain a modern nuclear weapons infrastructure, yet the United States has fallen behind in sustaining a modern infrastructure that is resilient and has the capacity to respond to unforeseen threats. Additionally, the 2018 NPR reiterates the United States' commitment to effective nonproliferation and arms control measures, both of which are equally important as having a credible deterrent.

For the Nation to retain a credible deterrent and prevent, counter, and respond to global nuclear security threats, NNSA will require significant and sustained investments in its nuclear security mission. In pursuit of these goals, the President's FY 2020 budget request for NNSA is \$16.5 billion. This is an increase of \$1.3 billion, or 8.3 percent, over the FY 2019 enacted level.¹

Weapons Activities Appropriation

The FY 2020 budget request for the *Weapons Activities* account is \$12.4 billion, an increase of \$1.3 billion, or 12 percent, over FY 2019 request levels. The programs funded in this account support the Nation's current and future defense posture and the associated nationwide infrastructure of science, technology, engineering, cybersecurity, and production capabilities.

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.

Maintaining the Stockpile

In FY 2019, the science-based Stockpile Stewardship Program supported certifying to the President for the 23rd consecutive year that the U.S. nuclear weapons stockpile remains safe, secure, and reliable without the need for nuclear explosive testing. This remarkable scientific achievement is made possible through the work accomplished by NNSA's world-class scientists, engineers, and technicians, and through investments in state-of-the-art diagnostic tools, high performance computing platforms, and modern facilities.

For *Directed Stockpile Work (DSW)*, the FY 2020 budget request is \$5.4 billion, an increase of \$768 million, or 16.5 percent, over the FY 2019 enacted level. Included within this request is funding to support the LEPs, modifications, and a major alteration. These modernization efforts are aligned with the needs outlined in the 2018 NPR and approved by the NWC.

W76-1 LEP: The W76-1 LEP, which directly supports the sea-based leg of the nuclear triad, completed its production run in December 2018. Close-out activities in FY 2020 include

¹ Amounts do not reflect the transfer of funds from Naval Reactors to the Office of Nuclear Energy for maintenance and operation of the Advanced Test Reactor in FY 2019.

archiving production tooling and program records, and completing component overbuilds to support hardware provisioning for the life of the warhead system.

W76-2 Modification Program: The W76-2 is currently on schedule and on budget. The First Production Unit (FPU) was completed in February 2019. By providing the U.S. an assured ability to respond in kind to a low-yield nuclear attack, the W76-2 discourages an adversary from pursuing such an attack and therefore strengthens deterrence. Having credible response options to a nuclear attack of any magnitude ensures no adversary mistakenly believes the U.S. would be deterred from responding to a low-level nuclear attack for fear of escalation.

B61-12 LEP: The B61-12 LEP will consolidate four variants of the B61 gravity bomb and improve the safety and security of the weapon. Currently in Phase 6.4, Production Engineering, this LEP has demonstrated system performance in over 60 integrated ground and flight tests, including eight joint flight test drops. The B61-12 LEP will enter Phase 6.5, First Production, in the fourth quarter of FY 2019, following completion of system qualification and Pantex Plant production readiness activities.

W88 Alteration 370: The FPU is on track for completion by December 2019. This program, which also supports the sea-based leg of the nuclear triad, is currently in Phase 6.4, Production Engineering, and will enter Phase 6.5, First Production, in September 2019.

W80-4 LEP: In February 2019, the NWC approved the W80-4 LEP to transition into Phase 6.3, Development Engineering. The FY 2020 request for \$899 million will allow the W80-4 LEP to remain on track to achieve FPU completion in FY 2025 in support of the Air Force's Long-Range Stand-Off (LRSO) cruise missile.

W87-1 Modification Program: The W87-1 program will replace the aging W78 warhead, with planned first production in 2030 to support fielding on the U.S. Air Force's Ground Based Strategic Deterrent (GBSD) missile system. In September 2018, the NWC authorized restart of Phase 6.2, Program Feasibility Study, activities on the W78 replacement warhead and renamed it the W87-1. The W87-1 Modification Program will improve the warhead's safety and security, addressing design, material obsolescence, performance, and survivability considerations.

Within DSW, the FY 2020 budget request includes \$636 million for *Stockpile Systems*, an increase of \$36 million, or 6.1 percent above the FY 2019 enacted level. This program sustains the stockpile in accordance with the Nuclear Weapon Stockpile Plan by producing and replacing limited-life components such as neutron generators and gas transfer systems; conducting maintenance, surveillance, and evaluations to assess weapon reliability; detecting and anticipating potential weapon issues; and compiling and analyzing information during the annual assessment process.

The DSW request also includes \$1.1 billion for *Stockpile Services*, an increase of \$76 million, or 7.2 percent, above the FY 2019 enacted level, to support the modernization of capabilities to improve efficiency of manufacturing operations to meet future requirements. This request supports all DSW operations by funding programmatic and infrastructure management, and

maintaining the core competencies and technologies essential for reliable and operable stewardship capabilities.

The FY 2020 budget for *Strategic Materials* is necessary to maintain NNSA's ability to produce nuclear and other strategic materials associated with its weapons programs, as well as refurbish and manufacture components made from these materials. This includes uranium, plutonium, tritium, and lithium.

Strategic Materials Sustainment: The request of \$257 million, an increase of \$41 million, or 18.8 percent, above the FY 2019 enacted level, will develop and implement strategies to maintain the technical base for strategic materials in support of NNSA's nuclear weapons, nonproliferation, and naval nuclear propulsion activities at NNSA's eight sites.

Uranium Program: The FY 2020 budget request of \$909 million for the Uranium Program is comprised of Uranium Sustainment (\$94 million), Process Technology Development (\$70 million), and the UPF project (\$745 million).² Uranium Sustainment supports the program to maintain existing enriched uranium capabilities through enhanced equipment maintenance while preparing to phase out mission dependency on Building 9212, a Manhattan Project-era production facility at Y-12. The funding request will enable NNSA to sustain uranium manufacturing capabilities while accelerating planning and execution of the Building 9212 exit strategy to reduce risks associated with transitioning enriched uranium capabilities to the UPF. Process Technology Development supports key capability transitions out of Building 9212, including chip processing, purified metal production, and recovery of low equity material, into enduring nuclear facilities. Funding for UPF will support peak construction activities in FY 2020 and FY 2021. UPF will provide uranium casting, special oxide production, and salvage and accountability capabilities for the enterprise.

Plutonium Sustainment: The FY 2020 budget request of \$712 million, an increase of \$351 million, or 97.2 percent, above the FY 2019 enacted level, supports continued progress to meet pit production requirements. The requested funding would support efforts to begin the long-term plan to develop a capability to produce no fewer than 80 war-reserve pits per year by 2030, as directed in the 2018 NPR.

The time to move forward is now. Repurposing the Mixed Oxide (MOX) Fuel Fabrication Facility and producing plutonium pits at SRS and LANL is the preferred path to achieve the critical DoD requirement of 80 pits per year by 2030. Even though this approach will require NNSA to fund activities at two sites, any interruption or delay to pit production in the future due to the lack of resiliency will have huge cost increases across the entire nuclear security enterprise. NNSA is investing in the Savannah River Plutonium Processing Facility. The agency is executing conceptual design activities for the repurposed MOX Fuel Fabrication Facility and moving forward with National Environmental Policy Act activities.

NNSA is also investing at LANL to provide all the tools necessary for the enterprise to successfully support an enduring plutonium pit production mission to produce 30 pits per year by

² Process Technology Development is funded under the Advanced Manufacturing Development program, and the UPF project is funded under Infrastructure and Operations.

2026. NNSA anticipates \$3 billion in total funding over the next five years to enable this, and LANL is actively installing pit production equipment and has begun hiring to meet future work scope. As the Nation's plutonium center of excellence for research and development, LANL plays a critical role in early design efforts for pit production.

In addition, NNSA's budget request includes funding for the Chemistry and Metallurgy Research Replacement project at LANL, which supports our plan to cease operations in buildings dating back to the Manhattan Project, in the height of the Cold War, and transition to modern facilities.

Tritium Program: The FY 2020 budget request of \$269 million, a decrease of \$21 million, or 7.3 percent, below the FY 2019 enacted level, will provide the tritium necessary for national security requirements. Tritium must be replenished regularly because it radioactively decays at 5.5 percent per year. Tritium availability is dependent on both the production of new tritium and the recovery and recycling of tritium from returned warhead components. Mission requirements necessitate that tritium production double by the mid-2020s. NNSA's tritium strategy focuses on increasing tritium production in Tennessee Valley Authority reactors and modernizing infrastructure at SRS to support the tritium supply chain.

Lithium Program: The FY 2020 budget request of \$29 million, a decrease of \$335,000, or 1.1 percent below the FY 2019 enacted level, supports a lithium bridging strategy to maintain the production of lithium. The FY 2020 budget request includes \$32 million for the Lithium Processing Facility (LPF), which will replace 1940s infrastructure at Y-12 and house lithium processing capabilities by 2030. NNSA completed an Analysis of Alternatives (AoA) for the LPF and is preparing for Critical Decision 1, establishing the preferred alternative design and estimated budget.

Domestic Uranium Enrichment (DUE): The FY 2020 budget request of \$140 million, an increase of \$90 million, or 180 percent above the FY 2019 enacted level, will continue efforts to make available, when needed, the necessary supplies of enriched uranium for a variety of national security needs. The DUE program schedule is driven by the nearest-term defense need—unobligated low enriched uranium for tritium production. Other Departmental needs for enriched uranium (e.g., research reactors, naval fuel) are supported by this effort as well.

For *Research, Development, Test, and Evaluation (RDT&E)*, the FY 2020 budget request is \$2.3 billion, an increase of \$264 million, or 13.1 percent above the FY 2019 enacted levels.

Increases to the *Science Program* (\$587 million) provide additional funding to support subcritical experiments for pit reuse and advanced diagnostics for subcritical hydrodynamic integrated weapons experiments that produce data for stockpile certifications.

The *Engineering Program* (\$234 million) sustains NNSA's capability for creating and maturing advanced toolsets and technologies to improve weapon surety and support annual stockpile assessments.

In FY 2020, the *Inertial Confinement Fusion Ignition and High Yield Program* (\$481 million) will continue to maintain essential experimental capabilities and expertise in high energy density

stockpile science. These efforts continue to provide data to reduce uncertainty in calculations of nuclear weapons performance and improve the predictive capability of science and engineering models in high-pressure, high-energy, high-density regimes.

The FY 2020 request includes \$840 million for the *Advanced Simulation and Computing* (ASC) Program, which continues NNSA's close collaboration with DOE's Office of Science to implement the Exascale Computing Initiative. The ASC Program supports stockpile stewardship by developing and delivering predictive simulation capabilities for nuclear weapons systems in addition to deploying increasingly more powerful supercomputers at Sandia, Los Alamos, and Lawrence Livermore National Laboratories.

The *Secure Transportation Asset* (STA) program provides safe, secure movement of nuclear weapons, special nuclear material, and weapon components to meet projected DOE, DoD, and other customer requirements. The Office of Secure Transportation has an elite security workforce that performs sensitive and demanding work; our agents are among the most highly trained and dedicated national security personnel operating within the United States. The FY 2020 budget request is \$317 million, of which \$80 million continues our efforts to modernize and replace the existing fleet of transporters with the Mobile Guardian Transporter (MGT). The MGT will be used for the containment and transport of nuclear weapons, weapons components, and/or special nuclear materials.

Improving Safety, Operations, and Infrastructure

An effective, responsive, and resilient nuclear weapons infrastructure is essential to the U.S. capacity to adapt flexibly to shifting requirements. Such an infrastructure offers tangible evidence to both allies and potential adversaries of U.S. nuclear weapons capabilities and can help to deter, assure, hedge against adverse developments, and discourage adversary interest in arms competition.

More than half of NNSA's facilities are over 40 years old, and roughly 30 percent date back to the Manhattan Project. It will take sustained, significant resources to modernize NNSA's nuclear weapons infrastructure.

Thanks to the support of the Administration and Congress, NNSA is making progress in repairing, replacing, and modernizing NNSA's facilities and stabilizing deferred maintenance; yet much more remains to be done. The FY 2020 budget request for *Infrastructure and Operations* is \$3.2 billion, an increase of \$121 million, or 3.9 percent above the FY 2019 enacted level. It includes \$1.1 billion for line item construction and over \$580 million for minor construction and equipment recapitalization needs. Delivering these projects on budget and schedule is contingent upon stable and predictable funding profiles, and support for the President's budget request.

Many of NNSA's excess process-contaminated facilities will ultimately be transferred to DOE's Office of Environmental Management (EM) for disposition. For example, EM commenced efforts to remove Building 280 Pool Type Reactor and ancillary facilities at Lawrence Livermore

National Laboratory. NNSA identified five (including Building 280) of the top ten highest risk excess facilities at Lawrence Livermore National Laboratory.

In the interim, NNSA is focusing on reducing risks where possible. NNSA has made critical investments to stabilize high-risk process-contaminated facilities until ultimate disposition, including at Y-12's Alpha 5 and Beta 4 facilities. In FY 2020, NNSA is using the authority Congress provided in the FY 2018 National Defense Authorization Act (NDAA) to pursue disposition of several high-risk process-contaminated excess facilities with a project cost of less than \$50 million. NNSA also remains committed to reducing the risk of non-process contaminated facilities by dispositioning facilities where possible. For example, NNSA completed the Pantex Drummond Office Building (formerly known as the Administrative Support Complex) at the Pantex Plant outside of Amarillo, Texas in 2018. This building provides 1,000 employees with modern, energy efficient workspace. As a result, NNSA is now disposing of dilapidated, 1950s-era buildings and eliminating approximately \$20 million in deferred maintenance. In FY 2020, NNSA plans to fund the disposition of 24 additional facilities totaling 75,000 gross square feet.

Defense Nuclear Security's FY 2020 budget request is \$778 million, an increase of \$88 million, or 12.7 percent, over the FY 2019 enacted amount. To execute its enterprise security program, DNS provides funding to the sites for: protective forces; physical security systems; information security and technical security; personnel security; nuclear material control and accountability; and security program operations and planning. While NNSA faces challenges replacing and refreshing aging physical security infrastructure, we are making key investments in recapitalizing this infrastructure through the Security Infrastructure Revitalization Program (SIRP). SIRP projects address aging high-priority security systems and related security infrastructure and equipment needs at all NNSA sites. NNSA will continue to execute ongoing line-item security projects as well, including the effort to reduce the Y-12 Protected Area and use security resources more efficiently. In addition, NNSA will sustain counter unmanned aircraft systems implementation and operation at sites possessing Category 0/I quantities of special nuclear material.

Information Technology and Cybersecurity enable every element of NNSA's missions. The FY 2020 budget request is \$309 million, an increase of \$88 million, or 40 percent over the FY 2019 request. This increase will continue cybersecurity enhancements, bolster cybersecurity capabilities, and support the continuation of IT modernization efforts. NNSA is making steady progress in enhancing and upgrading the components of the Enterprise Secure Computing environment to ensure that nuclear security enterprise missions can be completed without disruption. As NNSA mission requirements expand in scope, the IT and cyber programs require modernization, expansion, and innovation in a commensurate fashion. Cybersecurity is a defense and deterrence mechanism and a powerful tool. In the current threat environment, NNSA cannot afford to neglect its cybersecurity capabilities, which serve as frontline assets that protect the information, systems, and networks NNSA depends on to execute our mission.

Defense Nuclear Nonproliferation Appropriation

The FY 2020 budget request for the Defense Nuclear Nonproliferation account is \$2 billion, an increase of \$63 million, or 3.3 percent, above the FY 2019 request. Defense Nuclear

Nonproliferation account activities address the entire nuclear threat spectrum by helping to prevent the proliferation of nuclear weapons, counter the threat of nuclear terrorism, and respond to nuclear and radiological incidents around the world. The FY 2020 budget request funds two program mission areas under this account: the Defense Nuclear Nonproliferation (DNN) Program and the Nuclear Counterterrorism and Incident Response (NCTIR) Program.

Nonproliferation Efforts

The Office of Defense Nuclear Nonproliferation works to: remove or eliminate vulnerable nuclear material; improve global nuclear security through multilateral and bilateral technical exchanges and training workshops; help prevent the illicit trafficking of nuclear and radioactive materials; secure domestic and international civilian buildings containing high-priority radioactive material; provide technical reviews of U.S. export license applications; conduct export control training sessions for U.S. enforcement agencies and international partners; strengthen the IAEA's ability to detect and deter nuclear proliferation; advance U.S. capabilities to monitor arms control treaties and detect foreign nuclear programs; and maintain organizational readiness to respond to and mitigate radiological or nuclear incidents worldwide.

The *Material Management and Minimization (M3)* program provides an integrated approach to addressing the risk posed by nuclear materials. The FY 2020 budget request is \$334 million, an increase of \$40 million, or 13.5, percent above the FY 2019 enacted level. The request supports the conversion or shut-down of research reactors and isotope production facilities that use HEU and the acceleration of developing new, non HEU-based molybdenum-99 production technologies in the United States. Additionally, the request for M3 supports the removal and disposal of weapons-usable nuclear material, with priority on expediting the removal of surplus plutonium from the State of South Carolina and continuing the transition to the dilute and dispose strategy for surplus plutonium disposition.

The *Global Material Security* program works with partner nations to increase the security of vulnerable nuclear and radioactive materials and improve the ability to deter, detect, and investigate illicit trafficking of these materials. The FY 2020 budget request of \$342 million, a decrease of \$65 million, or 15.9 percent, below the FY 2019 enacted level and includes efforts to secure the most at-risk radioactive material in U.S. high-threat urban areas by the end of FY 2020.

The *Nonproliferation and Arms Control* program develops and implements programs to: strengthen international nuclear safeguards; control the proliferation of nuclear and dual-use material, equipment, technology and expertise; verify nuclear reductions and compliance with nonproliferation and arms control treaties and agreements; and address enduring and emerging proliferation challenges requiring the development of innovative policies and approaches. The FY 2020 budget request for this program is \$137 million, an increase of \$6 million, or 5.8 percent, above the FY 2019 enacted level. This increase serves to advance and complete development of the new Export Compliance Assistance Program to deploy export control training across DOE and NNSA facilities, implement new 10 CFR Part 810 civil penalty authority pursuant to the FY 2019 NDAA, and establish and maintain a nonproliferation

enrichment testing and training platform in cooperation with the IAEA and select foreign partners.

The *Defense Nuclear Nonproliferation Research and Development* program supports innovative unilateral and multilateral technical capabilities to detect, identify, and characterize foreign nuclear weapons programs, illicit diversion of special nuclear material, and nuclear detonations worldwide. The FY 2020 budget request for this program is \$495 million, a decrease of \$80 million, or 13.9 percent, below the FY 2019 enacted level. This decrease is due to shifting the HEU Reactor Conversion program to M3, as it is no longer in the research and development phase.

Nonproliferation Construction consolidates construction costs for DNN projects. The FY 2020 budget request is \$299 million, an increase of \$79 million, or 35.9 percent, above the FY 2019 enacted level. Last year, NNSA terminated activities for the MOX Fuel Fabrication Facility project to pursue the dilute and dispose option to fulfill the U.S. commitment to dispose of 34 metric tons of plutonium. The \$220 million for the MOX Fuel Fabrication Facility will be used to continue termination activities. The request also includes \$79 million for the Surplus Plutonium Disposition project, which supports the dilute and dispose strategy.

Nuclear Counterterrorism and Incident Response (NCTIR)

The Office of Counterterrorism and Counterproliferation (CTCP) provides effective capabilities to respond to any nuclear or radiological incident in the United States or abroad by applying the unique technical expertise found in NNSA's nuclear security enterprise. Highly trained personnel with specialized technical equipment maintain readiness to support lead federal agencies to find and render safe potential nuclear and radiological threat devices, to effectively manage the consequences of nuclear or radiological emergencies, and to support enhanced security operations for National Security Special Events (NSSE).

NNSA's Aerial Measuring System (AMS) provides airborne remote sensing in the event of a nuclear or radiological accident or incident within the continental United States, as well as in support of regularly scheduled NSSE. The AMS fleet consists of three Beechcraft B200 fixed-wing aircraft with an average age of 33 years and two Bell 412 helicopters with an average age of 24 years. The age of the current aircraft leads to unscheduled downtime resulting in reduced mission availability. A 2017 AoA on the AMS aircraft determined that recapitalization of the aging aircraft fleet is necessary to continue to provide Federal, State, and local officials with rapid radiological information following an accident or incident. In FY 2019, the fixed-wing aircraft will be replaced, and the rotary-wing aircraft will be replaced in FY 2020. The FY 2020 budget request for AMS recapitalization is \$35.5 million.

NNSA, in conjunction with the Federal Bureau of Investigation (FBI), supports render safe teams at FBI field offices in 11 major American cities that are specially trained and equipped to identify and mitigate the function of a nuclear or radiological device (i.e., "stabilization"). CTCP will conduct stabilization training and operations and begin transitioning to the Capability Forward initiative, under which lifesaving responses to a nuclear threat device will be accelerated. Under this initiative, NNSA will provide additional training, equipment, and

technical support to the current 11 stabilization cities – eventually growing to 14 U.S. cities by FY 2022 – to allow FBI teams to execute render safe operations more rapidly. CTCP will also improve and expand NNSA training facilities to accommodate the increased training requirements associated with regional render safe capabilities.

The Nation’s nuclear incident response teams require the ability to communicate classified technical assessments in deployed, and often austere, environments using highly secure means. Information requirements encompass both nuclear device design information and intelligence assessments. The equipment used by NNSA’s nuclear incident response teams is aging, resulting in increasing maintenance costs and heightened risks to the emergency response mission. This budget includes funding for recapitalization of incident response equipment consistent with lifecycle planning to maintain operational readiness. The budget also includes funding for state-of-the-art, secure, deployable communications systems that are interoperable with FBI and DoD mission partners that will help provide decision makers with real-time technical recommendations to mitigate nuclear terrorist threats.

CTCP maintains an operational nuclear forensics capability in three distinct areas: (1) pre-detonation device disassembly and examination; (2) post-detonation assessment; and (3) analysis and characterization of nuclear materials. The program maintains readiness to deploy device disposition and device assessment teams, conduct laboratory operations in support of analysis of bulk actinide forensics, and deploy subject matter expertise and operational capabilities in support of ground sample collections that support attribution of a nuclear detonation.

The *Emergency Operations* program’s FY 2020 budget request includes \$35.5 million under NCTIR to support NNSA’s Office of Emergency Operations. This funding will support NNSA’s all-hazard emergency response capabilities that positively impact the Department’s emergency management continuity and devolution programs, enhance the ability of the Department to respond to, and recover from, catastrophic emergencies or other man-made hazards or natural disasters.

Naval Reactors Appropriation

Advancing Naval Nuclear Propulsion

Nuclear propulsion for the U.S. Navy’s fleet of submarines and aircraft carriers is critical to the security of the United States and its allies as well as the security of global sea lanes. The Office of Naval Reactors remains at the forefront of technological developments in naval nuclear propulsion by advancing new technologies and improvements in naval reactor performance. This preeminence provides the U.S. Navy with a commanding edge in naval warfighting capabilities.

The *Naval Reactors* FY 2020 budget request is \$1.65 billion, a decrease of \$140 million or approximately 8 percent, below the FY 2019 enacted level. This request reflects reductions to planned funding levels following additional funding enacted in FY 2018 for the S8G Prototype Refueling Overhaul and Spent Fuel Handling Recapitalization Project. In addition to supporting today’s operational fleet, the requested funding is the foundation for Naval Reactors to deliver

tomorrow's fleet and recruit and retain a highly-skilled workforce. One of Naval Reactors' three national priority projects, continuing design and development of the reactor plant for the Columbia-Class submarine, featuring a life-of-ship core and electric drive, will replace the current Ohio-Class fleet and provide required deterrence capabilities for decades. The project to refuel a research and training reactor in New York will enable 20 more years of research, development, and training for fleet operators. Funding will also be used to support construction of a new spent fuel handling facility in Idaho that will facilitate long term, reliable processing and packaging of spent nuclear fuel from aircraft carriers and submarines.

Naval Reactors has requested funding in FY 2020 to support these projects and fund necessary reactor technology development, equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing a small but high-performing technical base, the teams at Bettis Atomic Power Laboratory in Pittsburgh, Pennsylvania; Knolls Atomic Power Laboratory and Kesselring Site in New York; and the spent nuclear fuel facilities in Idaho can perform the research and development, analysis, engineering, and testing needed to support today's fleet at sea and develop future nuclear-powered warships. These laboratories also perform the technical evaluations that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses to provide nuclear safety and maximize operational flexibility.

NNSA Federal Salaries and Expenses Appropriation

The FY 2020 budget request for *Federal Salaries and Expenses* is \$435 million, an increase of \$25 million, or 6.0 percent, over the FY 2019 enacted level. NNSA's workforce is critical to the success of the Nation's nuclear security enterprise. NNSA must have a sufficient workforce, with the right capabilities, to ensure it can modernize the nuclear deterrent, recapitalize an aging infrastructure, and continue to meet the requirements of our nonproliferation and counterterrorism programs. The 2018 NPR highlighted the need to properly support civilian personnel who protect the United States against nuclear threats. Effective deterrence would be impossible without the vital contributions our personnel make to the United States' nuclear capabilities and deterrence.

If NNSA is to be successful, funding alone will not be enough. NNSA will need to have the necessary human resource authorities to attract and retain the best and brightest workforce from around the country, fostering interest through internships or skilled trade programs, and clearing them for classified work as quickly as possible. This includes jobs not just in science, technology, and engineering but also manufacturing, maintenance, project and program management, and construction.

Meeting NNSA's growing mission requirements, as described in the 2018 NPR will require an aggressive hiring strategy for the next two years. Since 2010, NNSA's program funding has increased 50 percent, while staffing has decreased 10 percent. The FY 2020 request increases NNSA staffing to 1,753 full-time equivalents (FTEs), an increase of 95 FTEs from the current on-board level of 1,658 Federal employees. NNSA would benefit from the elimination of the overall cap on FTEs and excepted service personnel.

Last year, two independent studies identified NNSA's unmet critical staffing needs. The Office of Personnel Management (OPM) and NNSA's Office of Cost Estimating and Program Evaluation (CEPE) found that NNSA was understaffed across all functions. The number of additional staff recommended in both studies would exceed the statutory cap on NNSA's full-time equivalent employees. In March 2019, the Government Accountability Office (GAO) endorsed both OPM and CEPE's staffing analyses' conclusions of critical staff shortfalls and needs across multiple NNSA functions. GAO's endorsement supports NNSA's request for additional hiring authorities that would eliminate personnel caps, which would allow us to put significant resources behind our mission priorities. NNSA is focusing on developing a concrete strategic staffing plan based on the information provided by the two independent studies and GAO's report.

Management and Performance

Since 2011, NNSA has delivered approximately \$2 billion in projects, a significant portion of NNSA's total project portfolio, under budget. We are committed to encouraging competition and increasing the universe of qualified contractors by streamlining major acquisition processes. NNSA will continue to focus on delivering timely, best-value acquisition solutions for all programs and projects, by using a tailored approach to contract structures and incentives that are appropriate for the special missions and risks at each site. NNSA's Office of Acquisition and Project Management continues to: lead improvements in contract and project management practices; provide clear lines of authority and accountability for program and project managers; improve cost and schedule performance; and ensure that Federal Project Directors and Contracting Officers possess the appropriate skill mix and professional certifications to manage NNSA's work.

Conclusion

NNSA's diverse missions are critical to the national security of the United States: 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 naval nuclear propulsion to the U.S. Navy's fleet of aircraft carriers and submarines. NNSA is mindful of its obligation to improve acquisition, safety, and security practices continually, and to use in a responsible manner, the resources entrusted to it by Congress and the American people. By investing in our nuclear security enterprise and continuing our efforts to modernize our scientific, technical, and engineering capabilities and infrastructure, NNSA will continue to deliver on its nuclear security mission.

Lisa E. Gordon-Hagerty
Under Secretary for Nuclear Security and NNSA Administrator

Lisa E. Gordon-Hagerty serves as the Under Secretary for Nuclear Security of the U.S. Department of Energy (DOE) and Administrator of the National Nuclear Security Administration. She was confirmed by the U.S. Senate on February 15, 2018. With more than 30 years of national security experience, Ms. Gordon-Hagerty is responsible for the management and operations of NNSA in support of President Trump's and Secretary Perry's nuclear security agenda.

Ms. Gordon-Hagerty served previously in several U.S. Government leadership positions, including as the Director of Combating Terrorism, National Security Council staff, directing overseas crisis and consequence management and responsible for coordinating the U.S. Government's activities to deter, disrupt, prevent, and respond fully to conventional, biological, chemical, nuclear or radiological WMD attacks, through research and development, special operations, intelligence, and exercises/contingency planning. She also served at DOE as the Director, Office of Emergency, Defense Programs, administering and directing the Nation's technical nuclear emergency response programs and assets utilized in response to nuclear terrorism, radiological accidents, nuclear weapons accidents and major radiological emergencies worldwide, and as Acting Director, Office of Weapons Surety. Ms. Gordon-Hagerty was a professional staff member on the U.S. House of Representatives Committee on Energy and Commerce, providing technical support to Committee Members on issues related to DOE national security issues. She began her professional career as a health physicist at DOE's Lawrence Livermore National Laboratory.

Prior to joining the Trump Administration, Ms. Gordon-Hagerty was president of Tier Tech International, Inc., a Service Disabled Veteran Owned Small Business providing professional expertise to combating weapons of mass destruction terrorism worldwide. She was also president and CEO of LEG, Inc., a consulting firm focusing on national security issues. Ms. Gordon-Hagerty served as the Executive Vice President and Chief Operating Officer of USEC, Inc.

Ms. Gordon-Hagerty holds a Master of Public Health degree in Health Physics and a Bachelor of Science, both from the University of Michigan.

**Written Statement of Anne Marie White
Assistant Secretary for Environmental Management
Before the Subcommittee on Strategic Forces Committee on Armed Services
United States House of Representatives
April 9, 2019**

Chairman Cooper, Ranking Member Turner and Members of the Subcommittee, thank you for the opportunity to appear before you today to represent the Department of Energy's (DOE) Office of Environmental Management (EM). I would like to provide you with an overview of the EM program, key accomplishments during the past year, and planned accomplishments through the President's Fiscal Year 2020 Budget request of \$6.5 billion, which includes \$5.5 billion in Defense Environmental Cleanup funding.

The request demonstrates the Administration's continued commitment to the vital mission of EM to address the environmental legacy of nuclear weapons production that helped end World War II and the Cold War.

This legacy is one that includes challenges like the safe disposition of radioactive wastes; the management of spent nuclear fuel and special nuclear material; the cleanup of contaminated soil and groundwater; and the decontamination and decommissioning (D&D) of thousands of excess facilities.

Mr. Chairman, this year marks the 30th anniversary of the EM program. Since its inception, our dedicated workforce has worked effectively to reduce the footprint of the cleanup program from 107 sites comprising a total of 3,100 square miles to just 16 sites, with an active cleanup footprint of less than 300 square miles.

While it does not always make headline news, we are sustaining progress at each of our EM sites, and we have realized a set of key accomplishments over the past year.

EM took another significant step towards large-scale cleanup at the Y-12 site in Oak Ridge, Tennessee, by removing over 3 tons of mercury from equipment and completing all of the site preparation required for construction of the new Mercury Treatment Facility. This vital infrastructure will help EM fulfill a commitment with the U.S. Environmental Protection Agency (EPA) and the State of Tennessee to reduce the levels of mercury leaving the Y-12 facility.

Workers in South Carolina consolidated more than 400,000 cubic yards of coal ash and ash-contaminated soil at the Savannah River Site. They completed it safely and 14 months ahead of schedule, saving \$9 million.

At Hanford, EM continued hot cell cleanup and workers began installing equipment to excavate highly contaminated soil under the 324 Building. This facility operated from 1966 to 1996 and supported research involving radioactive materials.

We broke ground on the new ventilation system at the Waste Isolation Pilot Plan (WIPP), our key facility for final disposition of transuranic waste across the EM complex.

At the Separations Process Research Unit (SPRU), in New York we completed H2 Building and Tank Farm D&D.

From my time in industry, I understand where cleanup work gets done. It is out in the field. Our men and women on the ground are doing a great job and making progress—but we must do more.

Despite this great work and the important federal investment year after year, EM faces significant challenges. Cleanup progress is being significantly outpaced by environmental liabilities.

Even with significant budgets, EM is swimming upstream as we gear up to tackle some of our remaining toughest challenges. Simply throwing more taxpayer dollars into EM will not address these challenges.

This Administration, and the Secretary of Energy's senior leadership team are taking action to ensure the sustainability of the EM program.

Since the inception of the EM program, our knowledge and technology have matured significantly. We need to employ a sustainable completion-centric cleanup approach, using the latest knowledge in waste composition, risks, and attainable end states. We need to pursue cleanup in a manner that properly incentivizes performance, strengthens oversight, and delivers results.

EM is committed to working in a collaborative manner with Congress and others toward a future that will not simply enable the cleanup program to continue – but will propel the mission forward and drive it toward completion and closure. The Subcommittee will see EM focus on strengthening program management, oversight, and accountability to ensure value for the American taxpayer.

That starts with abandoning vague notions of our challenges and truly getting to the bottom of what we are dealing with using accurate up-to-date information.

Work must be prioritized based on real risks and sound science, rather than perceived risks or soundbites.

There are some real potential improvements for how EM treats and disposes of waste safely, quickly, and cost-effectively. The Department has a responsibility to carefully evaluate these options, including new technologies, treatment options, and disposal capabilities that did not exist when cleanup plans were first developed.

To that end, EM is looking 10 years out at what the barriers are and how they could be mitigated for faster completion. We are developing site options analyses to identify opportunities to complete cleanup work through more efficient, innovative, or novel approaches over the next decade. This includes considering the range of possibilities in terms of what could be achieved

at sites across the complex if we are willing to reassess our assumptions, consider new approaches and disposal options, and just think outside the box.

EM will soon complete site options assessments and we look forward to engaging with Congress as well as stakeholders and regulators throughout the cleanup community on the best ways to move forward.

As announced in a Federal Register notice in October 2018, the Department is evaluating its interpretation of the statutory term high-level radioactive waste. In the notice, the Department sought public comment on an interpretation that would classify high-level radioactive waste based on its actual radiological content and associated risks rather than solely on the source of the waste. If implemented, this would bring the U.S. more in line with the rest of the world, and be consistent with many reports and recommendations from wide-ranging and non-partisan outside groups. It is important to note this is the first step in a process that must comply with existing programmatic and regulatory requirements and law. The Department's consideration of a new interpretation does not alter or abrogate the Department's responsibilities or policies under existing regulatory requirements or agreements.

EM is also taking steps to get the best value out of every cleanup dollar that Congress provides.

Consistent with the Deputy Secretary's initiative on regulatory reform, I have directed staff and the field to look at opportunities for change.

Based on my experience in the field, this will lead to an enhanced safety culture because many of the reforms are common sense approaches that can streamline our work.

EM is focused on driving down the operating and maintenance costs for its facilities, which represent a significant portion of EM's annual budget that could otherwise be used for actual cleanup work.

As project lifecycle schedules drag out, aging facilities' components and equipment are stretching resources. We can either invest money towards cleanup or we can maintain aging facilities and build new facilities, but we cannot do it all.

One of the most transformative initiatives is in the area of contracting. EM has billions of dollars in procurements coming up at some of our largest sites over the next few years, representing a significant opportunity to improve our procurement processes, contract management, and oversight performance.

Just last month, the Department released Final Requests for Proposals for the first two contracts that are representative of this new "end-state contract" model.

End-state contracting is not a contract type but an approach to creating meaningful and visible progress through defined end-states, even at sites with completion dates far into the future. This is intended to create and motivate a culture of completion.

Mr. Chairman, this new approach to procurement; the discussions we are having on the regulatory front; the ongoing options analyses; and the funding proposed in the Fiscal Year (FY) 2020 budget request, will yield impactful results.

The FY 2020 budget request for EM is \$6.5 billion, which includes \$5.5 billion for defense environmental cleanup activities; \$247 million; for non-defense environmental cleanup activities; and \$715 million for Uranium Enrichment Decontamination and Decommissioning Fund cleanup activities.

As EM is put on a sustainable path forward, the FY 2020 budget request provides the resources to build upon recent successes, bring a renewed sense of urgency to the program, and enable meaningful, measurable progress to projects and sites throughout the cleanup complex.

From day one, the Secretary of Energy has made the environmental cleanup mission a key priority for the Department of Energy.

EM's 2020 budget request provides the resources to make progress on cleanup activities across the complex, including increasing efforts to address radioactive tank waste at the Savannah River Site through start-up of the Salt Waste Processing Facility and continued construction activities for Saltstone Disposal Units.

At Hanford's Office of River Protection, the budget drives the focus on the Direct Feed Low Activity Waste approach to initiate tank waste treatment by December 2023.

Resources are also provided for Hanford's Richland Operations Office for work on River Corridor decontamination and decommissioning activities including remediation of the highly contaminated 300-296 waste site under the 324 Building.

At Oak Ridge, the request advances construction on the Outfall 200 Mercury Treatment Facility, continues deactivation and demolition of remaining facilities at the East Tennessee Technology Park, and continues preparation of Building 2026 to support processing the remaining U-233 material at the Oak Ridge National Laboratory.

The budget includes funding to initiate two transuranic waste processing lines, complete characterization of the high explosives plume in Canon de Valle, and implement the full interim measure for the chromium plume at Los Alamos in New Mexico.

At SPRU in New York, EM would be able to complete verification of cleanup, site restoration, and closeout activities.

Together, these investments for environmental management will enable EM to make significant progress in fulfilling its cleanup responsibilities.

EM's greatest successes have historically been achieved through the hard work and dedication of leaders on both sides of the aisle who are determined to get big things done. I want to express

my desire to work with the Congress towards a future that propels the EM mission forward and drives cleanup toward safe completion, sooner, and in a cost-conscious manner.

**Budget Authority and Planned Accomplishments for Selected Sites
(Dollars in Thousands)**

Office of River Protection, Washington

FY 2019 Enacted	FY 2020 Request
1,573,000	1,392,460

Key Accomplishments Planned for FY 2020

- Initiate cold commissioning of the Waste Treatment and Immobilization Plant to support Low Activity Waste Facility hot commissioning and production operations by December 31, 2023.
- Design and construct tank farm facility upgrades (i.e. 222-S Laboratory, 242-A Evaporator and the Effluent Treatment Facility) for staging waste in 2021 for Waste Treatment Plant operations.
- Incorporate lessons learned from Savannah River cesium processing to facilitate fabrication, testing and delivery of the Tank-Side Cesium Removal System to pretreat waste for the LAW Facility.
- Perform tank integrity activities to ensure adequate double shell tank space is available for Direct Feed Low Activity Waste (DFLAW) operations and AX retrievals.
- Complete retrieval of single shell tank AX-102 by 2021 in support of the corresponding Consent Decree milestone.
- Advance a production-scale offsite disposition path for tank waste, utilizing the regulatory pathways created by Test Bed Initiative
- Hanford Tank Closure End-State Contract scheduled for award in Q4 2019 incentivizes risk-based cleanup that reduces financial liability.

Richland Operations Office, Washington

FY 2019 Enacted	FY 2020 Request
954,097	718,098

Key Accomplishments Planned for FY 2020

- Reduce risk and facility costs by supporting construction activities for future relocation of Cesium & Strontium capsules to dry storage by the Tri-Party Agreement (TPA) due date of August 2025.

- Shrink the extent of radiological and chemical contamination in groundwater at Hanford through treatment of 2.2 billion gallons.
- Complete 324 Building structural modifications, removal of the hot cell floor, and readiness review activities for start of soil removal for remediation of the 300-296 waste site below the building.
- Hanford Central Plateau Cleanup End-State Contract scheduled for award in Q4 2019 incentivizes risk-based cleanup that reduces financial liability.

Savannah River Site, South Carolina

FY 2019 Enacted	FY 2020 Request
1,551,014	1,642,509

Key Accomplishments Planned for FY 2020

- Complete removal of material-at-risk from Building 235-F which addresses remaining activities in accordance with Defense Nuclear Facilities Safety Board Implementation Plan to reduce residual Plutonium 238.
- Liquid Waste/Salt Waste Processing:
 - Supports Salt Waste Processing Facility (SWPF) start of radioactive operations necessary to meet State commitments and advance completion of cleanup mission
 - Enables waste removal preparation activities required to support SWPF planned operations rate greater than current rate for salt waste processing, allowing tank closure to proceed at a more rapid pace.
 - Continues construction of Saltstone Disposal Unit 7 and initiate construction of Saltstone Disposal Units 8/9 and design of Saltstone Disposal Units 10-12 to support SWPF planned rates.
- Funding to initiate the Savannah River National Laboratory's Advanced Manufacturing Collaborative facility (AMC)

Idaho National Laboratory, Idaho

FY 2019 Enacted	FY 2020 Request
443,200	347,654

Key Accomplishments Planned for FY 2020

- Complete exhumations at Accelerated Retrieval Project area in support of meeting regulatory milestone to retrieve, process and dispose of targeted buried waste by 2023.

- Initiate hot operations of Integrated Waste Treatment Unit, pending successful demonstrations of the phase 2 simulant run number 3 and phase 3 performance run, to begin treating liquid sodium-bearing waste leading to closure of the final 3 liquid waste tanks.
- Complete processing and packaging of legacy transuranic waste so that it is ready for certification and shipment.
- Idaho Cleanup Project End-State Contract scheduled for award in Q2 2020 incentivizes risk based cleanup that reduces financial liability.

Oak Ridge Site, Tennessee

FY 2019 Enacted	FY 2020 Request
646,281	428,875

Key Accomplishments Planned for FY 2020

- Complete demolition of 90% of East Tennessee Technology Park facilities and continue environmental remediation work.
- Complete processing contact-handled and remote-handled legacy transuranic debris waste inventory.
- Complete construction of transuranic sludge processing test area.
- Complete preparation of Building 2026 for processing remaining U-233 material.
- Complete second of four years of construction of the Mercury Treatment Facility.
- Complete preliminary design and early site preparation of On-Site Comprehensive Environmental Response, Compensation, and Liability Act Disposal Facility.
- Oak Ridge Reservation Cleanup Contract End-State Contract scheduled for award in Q3 2020 incentivizes risk based cleanup that reduces financial liability.

Carlsbad Field Office, New Mexico

FY 2019 Enacted	FY 2020 Request
403,487	398,334

Key Accomplishments Planned for FY 2020

At Waste Isolation Pilot Plan (WIPP):

- Support receipt of up to 10 shipments of transuranic waste per week.
- Construction progress complete on Safety Significant Confinement Ventilation System (15-D-411) and 15% to 25% complete on Utility Shaft (formerly Exhaust Shaft) (15-D-412).
- Complete two infrastructure recapitalizations (public address system and electrical substations).

Los Alamos National Laboratory, New Mexico

FY 2019 Enacted	FY 2020 Request
220,000	195,462

Key Accomplishments Planned for FY 2020

- Commence operations in two (of three planned) TRU processing lines to treat waste for shipment to WIPP.
- Reduce risk by completing ~50 shipments of TRU waste to WIPP.
- Complete characterization of RDX (high explosives) plume beneath Cañon de Valle and continue activities to determine final remedy.
- Prevent migration of Chromium plume offsite by implementing a hydraulic barrier.
- Continue investigation and cleanup activities required to meet Consent Order milestones.
- Continue groundwater and surface water sampling to remain compliant with the Consent Order and Individual Permit.

Nevada National Security Site, Nevada

FY 2019 Enacted	FY 2020 Request
60,136	60,737

Key Accomplishments Planned for FY 2020

- Complete closure of Corrective Action Unit (CAU) 97 Yucca Flat/Climax Mine.
- Complete 3% for a total of 66% towards the closure of CAUs 101/102 Central and Western Pahute Mesa.
- Initiate and complete 18% towards the installation of 4 post-closure monitoring network wells for CAUs 97 Yucca Flat/Climax Mine and 99 Rainier Mesa/Shoshone Mountain.
- Conduct annual post-closure monitoring and maintenance of 197 closed-in-place contaminated soil and industrial-type sites.
- Conduct annual post-closure sampling, monitoring and maintenance at 16 well locations associated with 76 closed-in-place contaminated groundwater sites.
- Operate DOE-owned waste disposal facility with the capability to receive between 1.2 to 1.5million cubic feet of low-level and mixed low-level waste in support of cleanup activities across the DOE complex.
- Maintain Nevada's Agreements in Principal and grants and provide funds for the Low-Level waste fee agreement.
- Nevada Environmental Program Multiple Award Small Business End State Contract scheduled for award in Q2 2020 incentivizes risk based cleanup that reduces financial liability.

Anne Marie White
Assistant Secretary for the Office of Environmental Management

Anne Marie White was confirmed as the Assistant Secretary for Environmental Management (EM) in March 2018. As EM Assistant Secretary, Ms. White provides strategic executive leadership and oversight for the cleanup of contaminated nuclear weapons manufacturing and testing sites across the United States to support the Department of Energy's mission for addressing environmental and nuclear challenges.

Since joining the Department, Ms. White has focused her efforts on improving the trajectory of the EM program and reducing the nation's environmental liability by putting sites on a clear path to completion and enabling host communities to plan for a vibrant future. Her initiatives include making meaningful reductions in risks, life cycle costs and schedules; classification of waste based on its actual contents and associated risks; establishment of a disposal policy defining the best options to safely treat, dispose and contain waste; meaningful stakeholder engagement; and end state contracting to streamline and accelerate cleanup by pursuing strategies that are faster, more cost effective, and more technically sound to reduce risk to human health and the environment.

Ms. White has more than 25 years of experience across a broad range of activities within the nuclear field with industry-recognized credentials in characterization and disposition of radiologically contaminated sites; dose modeling and assessment; and data analysis and integration leading to technically underpinned and cost-effective solutions. She started her own consulting firm to provide creative solutions in solving complex environmental challenges domestically and internationally with both private and public organizations. She has extensive hands-on in the field experience at many DOE sites and has supported a number of emerging nuclear power nations to develop legal and regulatory structures and national policies to deliver safe and effective solutions to develop nuclear expertise for peaceful purposes. Her international work has included producing draft national regulations for foreign governments in areas of nuclear safety, environmental protection and nuclear liability issues and is a recognized leader for innovative stakeholder outreach strategies in diverse and difficult regulatory structures.

Ms. White holds a Bachelor of Science in Mathematics from the University of Kansas and a Master of Science in Nuclear Engineering/Health Physics from the University of Missouri-Columbia.

STATEMENT
OF
THE HONORABLE BRUCE HAMILTON, CHAIRMAN
DEFENSE NUCLEAR FACILITIES SAFETY BOARD
before the
COMMITTEE ON ARMED SERVICES, SUBCOMMITTEE ON
STRATEGIC FORCES
UNITED STATES HOUSE OF REPRESENTATIVES
APRIL 9, 2019

Chairman Cooper, Ranking Member Turner, and distinguished members of this Subcommittee, it is an honor to be before you today as chairman of the Defense Nuclear Facilities Safety Board to share my observations on the challenges and Board's actions associated with providing oversight of the Department of Energy's defense nuclear facilities complex.

For those members of the Subcommittee who may not be familiar with the work of the Board, we are responsible, by statute, to conduct independent oversight of defense nuclear facilities and to inform the Secretary of Energy when we find issues that challenge the adequate protection of public health and safety. The Board is also statutorily mandated to review the content and implementation of DOE standards, facility and system designs, and events and practices at DOE defense nuclear facilities that the Board determines have adversely affected, or may adversely affect, public health and safety.

The President's request for the Board is \$29,450,000 and 100 full-time equivalents (FTEs) to carry out the Board's mission in Fiscal Year 2020. This is a five percent decrease from the agency's Fiscal Year 2019 appropriation level of \$31,000,000. The Board's foundation is built on the expertise of its Board members and its staff in support of the Board's mission, and approximately two-thirds of the Board's annual budget is dedicated to salaries and benefits.

I would like to discuss a few of the Board's priorities as they relate to providing oversight of the Department of Energy's defense nuclear facilities complex. The Board currently has four open Recommendations that the Department is working to address and are in various stages of completion. First, Recommendation 2011-1, Safety Culture at the Waste Treatment and Immobilization Plant: the Department has completed its implementation plan, and the Board is evaluating the Department's actions against the original Recommendation to ascertain if progress was made to resolve the original concerns of the Recommendation. Second, Recommendation 2012-1, Savannah River Site Building 235-F Safety: the Department is working towards the mitigation of Pu-238 hazard and is currently focused on Cell 1. Next, Recommendation 2012-2, Hanford Tank Farms Flammable Gas Safety Strategy: the Department is working to implement tank ventilation that meets requirements for safety-related systems. Finally, Recommendation 2019-1, Pantex Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation: the Board is awaiting the Department's response regarding this most recent recommendation.

At Los Alamos National Laboratory, the Board plans to focus on the Plutonium Facility's (PF-4) seismic vulnerabilities of the structure, deficiencies in facility safety basis and safety systems, and deficiencies in nuclear criticality safety program. In addition, the Board is focused on Transuranic Waste Management including the safety basis for Area G transuranic waste operations and safety controls for mobile loading of transuranic waste for shipment to Waste Isolation Pilot Plant.

At the Idaho National Laboratory, the Board is analyzing implications of the April 2018 solid waste drum over-pressurization event in the Accelerated Retrieval Project (ARP) V. The Board sent two pieces of correspondence to share its concerns and outline open questions for the Department. The Board is also planning a public hearing for May 2019 to discuss the

implications of the hazards of solid waste and the controls the Department uses to protect the public.

At the Waste Isolation Pilot Plant, the Board has been and will continue to monitor steady state operations. The Board plans to continue reviewing revised safety basis and safety management programs related to maintenance, radiological protection, and ground control.

At Hanford the Department's clean-up work poses worker hazards and potential for radioactive releases. The Board plans to continue monitoring DOE efforts to demolish deactivated, high-hazard plutonium production and processing facilities, and to retrieve and disposition nuclear waste that was created during the production of plutonium.

At the Savannah River Site, the Board plans to focus on the Tritium Facilities and design basis accidents with severe onsite consequences. In addition, the Board plans to review processing and storage of nuclear materials, plutonium storage and down-blend, spent nuclear fuel storage and processing, high-level waste storage and processing, and the startup of the Salt Waste Processing Facility.

At the Y-12 National Security Complex, the Board will focus on the nuclear criticality safety program, uranium accumulation in process equipment, and construction of the Uranium Processing Facility.

The Board is also focused on aging infrastructure. Aging facilities are prone to degraded systems and structures, increased radiological hold-up, obsolescent equipment and unavailable replacement parts, and retrofits to meet evolving missions. The increased use of Administrative Controls coupled with inexperienced staff presents challenges. The Board is monitoring the Department's efforts to mitigate risks and develop replacement capabilities such as the Y-12

Extended Life Program, Los Alamos National Laboratory Plutonium Strategy, and Pantex ramps structural retrofits and safety system upgrades.

The Board also plans to perform design and construction oversight. Prior to construction of new facilities, the Board reviews safety basis and safety-related structures, systems, and components. During construction the Board is there to review quality assurance and operability testing of safety systems. More than a dozen new facilities are under the Board's purview including the Hanford Waste Treatment and Immobilization Plant and related facilities, Y-12 Uranium Processing Facility (UPF), Savannah River Salt Waste Processing Facility, and Pantex Material Staging Facility.

Now I would like to discuss the Board's most recent accomplishments that we will continue to build upon in the coming year. The Board reviewed the safety basis and control strategy for nuclear explosive operations at the Pantex Plant. In April 2018, the Board approved the conduct of a preliminary safety inquiry, which is a type of safety investigation under 42 U.S.C. § 2286a(b)(2) and 10 Code of Federal Regulations Part 1708, regarding implementation of 10 Code of Federal Regulations Part 830 at Pantex. Based on the preliminary safety inquiry, the Board determined that portions of the safety basis for Pantex nuclear explosive operations do not meet 10 Code of Federal Regulations Part 830; that multiple components of the process for maintaining and verifying implementation of the Pantex safety basis are deficient, including completion of annual updates as required by 10 Code of Federal Regulations Part 830; and that, to date, the NNSA Production Office and the Pantex management and operating contractor have been unable to resolve known safety basis deficiencies. The Board posted documents describing these conclusions on its public website on September 10, 2018. After sending the Secretary of Energy a Draft Recommendation and receiving the Secretary's response, on February 20, 2019,

the Board approved and sent the Secretary Board Recommendation 2019-1, *Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation at the Pantex Plant*. The Board is awaiting the Secretary's response due in early May. Given the importance of the Pantex Plant to the National Nuclear Security Administration's mission, its aging infrastructure, and increase in operational tempo, we are concerned with the safety posture at the Pantex Plant. The Board determined these were issues of adequate protection and conveyed those concerns in the form of a Recommendation.

On April 11, 2018, four waste drums at the Idaho National Laboratory underwent over-pressurization, ejecting their lids and spreading radiological waste within the ARP-V. The Department of Energy determined that waste in the drums generated methane gas, which contributed to the event. The Board determined that current drums with repackaged waste may contain flammable gases in high enough concentrations to allow deflagrations, and the Department of Energy currently does not have effective controls at the Idaho National Laboratory to prevent or mitigate such deflagrations. The Board continues to seek information related to these drums to determine if these are issues of adequate protection and recently sent the Secretary of Energy correspondence formally requesting information. As part of this effort, the Board intends to conduct a public hearing on the subject of safety management of solid waste storage and processing in the Department of Energy complex by the end of May 2019. The Waste Isolation Pilot Plant accident in February 2014 coupled with what we are seeing at the Idaho National Laboratory, confirms that legacy waste handling, processing, and packaging continues to be a challenge that warrants the Department's diligence. The Department needs to better understand how to package and store this waste safely at the generator sites even before transport to the Waste Isolation Pilot Plant.

The Board has also focused its resources on reviewing the combined Tritium Facilities Safety Basis at the Savannah River Site. In a June 4, 2018, letter to the Secretary of Energy, the Board stated it was concerned that there is a need to evaluate and implement additional safety controls for the Savannah River Site Tritium Facilities to address accident scenarios that may result in high radiological dose consequences to co-located workers or off-site public. The Board also noted concerns with how the facility worker is relied on to self-protect during events, the Department of Energy's application of administrative controls, and various analytical assumptions used in the safety basis for the facilities.

The Department of Energy is revising Title 10, Code of Federal Regulations, Part 830 (10 CFR Part 830), *Nuclear Safety Management*, which is the cornerstone of the Department of Energy's regulatory framework to ensure adequate protection of public health and safety. The Board has identified several concerns with the Department of Energy's notice of proposed rulemaking and communicated its comments in its letter of October 5, 2018, to the Secretary of Energy. The Board is concerned that the proposed revision will make it more difficult for the Department of Energy to exercise consistent oversight across the complex and loosens requirements upon which the Department of Energy and the public rely to ensure adequate protection of public health and safety. The Department has maintained a solid safety record at defense nuclear facilities and is working on simultaneous changes to its regulatory framework. The Board remains concerned that adjustments to the regulatory framework at a time when the complex is facing growth in mission, complicated decommissioning work, an always aging infrastructure, and human capital turnover could contribute to a less robust safety posture.

The Board utilized its staff to conduct nuclear criticality safety reviews in 2018 to ascertain the health of selected Department of Energy defense nuclear facilities complex

programs. In particular, the Board reviewed the management and operating contractor's nuclear criticality safety programs for compliance with ANSI/ANS criticality safety standards, as well as the Department of Energy's field office oversight. The Board's most recent review included the Y-12 National Security Complex. The Board's oversight of the Y-12 criticality safety program is ongoing. Criticality safety issues remain a concern across the complex.

Finally, in May 2018, the Department of Energy issued Order 140.1, *Interface with the Defense Nuclear Facilities Safety Board*, to replace its prior directive on interface with the Board, Manual 140.1-1B. Order 140.1 incorporated major changes including new restrictions and protocols regarding the Board's access to information, facilities, and personnel that could diminish the Board's ability to effectively perform its statutory mandate under the Atomic Energy Act of 1954, as amended. As written, Order 140.1 could limit Board oversight of many of the Department of Energy's defense nuclear facilities. The Board has communicated its concerns regarding Order 140.1 to the Secretary of Energy in its letters of September 17 and December 21, 2018, and has held three public hearings to gather information on the implementation of the order by the Department of Energy and its contractors. It is the unanimous view of the Board that DOE Order 140.1 is in direct conflict with a plain reading of the Atomic Energy Act (as Amended) in several ways. For instance, the Order defines the public as existing only outside the geographical site boundary. Such an interpretation could preclude Board oversight for workers, collocated workers, and general members of the public who were present inside a site boundary. Notably, it could also prevent Board oversight for important programs such as criticality safety. Not only is this inconsistent with the Atomic Energy Act, but this would be a clear departure from well-established past practices. In its December 21, 2018, letter, the Board reiterated its commitment to collaborate with the Department of Energy to

resolve these concerns, however, to date we have seen no evidence that the Secretary is inclined to do so.

I would also like to discuss several items of Board internal management. On August 14, 2018, the Board approved (three in favor, one opposed) the following motion made by then-Acting Chairman Hamilton:

“In order to improve effectiveness in conducting the Mission of the Defense Nuclear Facilities Safety Board through more robust field oversight and a leaner and nimbler headquarters staff, the Board approves and directs the following:

“1. The Acting Chairman shall establish an Executive Director of Operations (EDO) who has line authority over all Agency staff except the Office of the General Counsel. The EDO is the senior employee responsible for budgetary and general administration matters and the senior employee responsible for technical matters as specified in 42 U.S.C. § 2286. (c) (7)(C)(i) and (iii). The EDO position shall be filled through posting both internally and externally;

“2. The Acting Chairman shall re-structure the agency’s organization, administrative units, and functions in accordance with enclosure (1) while retaining the organizational flexibility to optimize performance;

“3. The Acting Chairman shall establish a limit of 100 FTE (86, plus 5 Board Members and 9 SES) for FY2019. The Acting Chairman shall reduce further the size of the Agency through selected attrition to 79 FTE (69, plus 5 Board Members and 5 SES), at which time that will become the new limit.

“4. The Acting Chairman shall implement this re-structuring as the approved FY 2019 staffing plan.

“These changes shall be executed in accordance with all applicable Federal statutes and regulations.”

Congressional appropriators did not support the plan, and they included language in the *Energy and Water Development and Related Agencies Appropriations Act, 2019* which preempted its implementation. Consequently, I have made no structural changes to our organization. I have directed hiring employees to backfill specific positions, and although we remain below our FY2019 funded 117 FTE, we will need to hire in order to achieve the 100 employees proposed in the 2020 budget.”

The Board contracted with the National Academy of Public Administration (NAPA) to perform a comprehensive assessment of the Board’s operations. In November 2018, NAPA issued its report, which provided numerous recommendations for improving the Board’s operations and mission effectiveness. The Board has begun to discuss the NAPA recommendations, identify corrective actions, and will continue this effort in 2019. The Board is currently exploring another contract with NAPA to review and revise the Board’s strategic plan for the next five years.

The Board’s Office of Inspector General (OIG) completed five assessments on Board programs during Fiscal Year 2018, including its Assessment of the Most Serious Management and Performance Challenges Facing DNFSB in Fiscal Year 2018. The Independent Evaluation of DNFSB’s Implementation of the Federal Information Security Modernization Act (FISMA) of 2014 for Fiscal Year 2017, (DNFSB-18-A-02) resulted in two recommendations to strengthen the information security program. The Board will continue to support the Inspector General’s audits of the Board’s operations. Chairman Cooper, Ranking Member Turner, thank you again

for the opportunity to be here today. We at the Board look forward to working with this Subcommittee and I stand ready to respond to any questions you may have.

Mr. Bruce Hamilton
Chairman, Defense Nuclear Facilities Safety Board

Bruce Hamilton of Dallas, Texas, was appointed Chairman by President Trump on October 3, 2018. Initially appointed to the Board by President Obama on August 26, 2015, he has served as a Board Member, as Vice Chairman, and as Acting Chairman. Hamilton is a veteran of four decades in the nuclear energy field. Prior to his appointment to the Board, he was the president of a nuclear fuel procurement company, and preceding that he was an engineering director at a commercial nuclear power plant where he held a Nuclear Regulatory Commission Senior Reactor Operator's license. As a U.S. Navy officer, Hamilton supervised nuclear operations in six warships, commanded a seventh, and served as the Reactor Officer for the mid-life refueling overhaul of an aircraft carrier.

A registered professional engineer in the State of Texas, Hamilton's academic credentials include a B.S. from Texas A&M University, an M.A. from the U.S. Naval Postgraduate School, and a Ph.D. from The Fletcher School of Law & Diplomacy.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

APRIL 9, 2019

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. 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?

Ms. GORDON-HAGERTY. 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.

Mr. COOPER. Mr. Hamilton, in your testimony you noted that the four waste drums at the Idaho Advanced Retrieval Project which exploded were a "near miss," and that there was "some degree of luck that nobody was there to get hurt." Yet you were the one Board Member to vote against the Board's recommendation, which simply requested additional information from the Department. Why? Further, you note that there is uncertainty around what is in the last 10% of drums left for processing. What gives you confidence that this—or something worse—will not occur again, particularly given the uncertainty around the material in the remaining drums and poor record keeping at Rocky Flats, where the drums originated?

Mr. HAMILTON.[†] On April 11, 2018, four waste drums at the Idaho National Laboratory underwent over-pressurization, ejecting their lids and spreading radiological waste inside the Advance Retrieval Project (ARP-V) structure. The event occurred at night when the facility was unoccupied and no workers were present; a near-miss, but nevertheless an event to be taken seriously. The Department of Energy subsequently determined that waste in the drums generated methane gas, causing the event, and additional controls were placed in effect to address the underlying cause. It is my view that the additional controls, coupled with the fact that over 90% (the more precise figure is 97%) of the targeted waste had already been processed without a similar incident, demonstrates adequate protection of the public health and safety.

On March 4, 2019, the Board approved sending correspondence to the Secretary of Energy (subsequently transmitted on March 12, 2019) opining that DOE does not have effective controls to prevent or mitigate such deflagrations, a position on which I disagree. More to the point, the correspondence invoked the statutory authority of the Atomic Energy Act (as Amended), 42 U.S.C. § 2286b(d). It required that DOE provide a briefing with analysis or supporting data to address six detailed questions related to this event as well as to programmatic concerns pertaining to the complex-wide environmental cleanup. I did not concur with the majority who voted to approve this correspondence.

[†]Mr. Hamilton sent his answers with a May 7, 2019, cover letter that read, in part: "Since your correspondence and the three enclosed questions were addressed directly and specifically to me and not to the Defense Nuclear Facilities Safety Board as a whole, I have provided my responses only from my perspective. The answers may not reflect the views of my fellow Board Members or the collective view of the Board."

In my dissent, I noted the following:

“42 U.S.C. § 2286b(d) authorizes the Board to, ‘...establish reporting requirements for the Secretary of Energy...’ The Board should generally practice a narrow interpretation of its statutory authority to require reports. This authority should be used with discretion, such as when information has been difficult to obtain through informal staff-to-staff interaction or when periodic recurring reports on program status are warranted. 42 U.S.C. § 2286b(d) authority should not be used as a mechanism to convey either an explicit or an implied suggestion for the Secretary to carry out an activity. In this case, that appears to be the message.

“Likewise, 42 U.S.C. § 2286b(d) should not be used as a surrogate for a formal Recommendation. In the event the issues identified in the Staff Issue Report, either individually or in their totality, challenge the ‘adequate protection of the public health and safety,’ the statutorily appropriate path would be to recommend action to the Secretary of Energy. In this case, there is no indication that this threshold has been reached.”

In other words, I believed the Board already had sufficient information to evaluate the risk associated with this event as well as the broader complex-wide related question. Further, I evaluated that risk as not rising to the threshold of challenging the adequate protection of the public health and safety. Even so, I did not vote against a subsequent motion made before the Board to hold a public hearing in May 2019 on safety management of waste storage and procession in the defense nuclear facilities complex.

In my view, DOE has in fact put in place the additional controls needed to ensure the adequate protection of the public health and safety. That adequate protection persists is further informed by the fact that most of the targeted waste was already processed event-free even without those controls. There will always be a chance that another event of this or of a different nature may occur, particularly given the uncertainty around the material in the remaining drums and the poor record keeping at Rocky Flats, where the drums originated. That said, confidence that something won’t occur is not the standard specified in the Atomic Energy Act (as Amended). Rather, the standard to which I am obliged is that of adequate protection of the public health and safety.

In the spirit of your question, I offer the following additional thoughts on just what I consider “adequate protection” means.

The Atomic Energy Act (as amended), at 42 U.S.C. § 2286a(a), states that, “The mission of the Board shall be to provide independent analysis, advice, and recommendations to the Secretary of Energy ... in providing adequate protection of public health and safety at ... defense nuclear facilities.” The AEA does not further define the term “adequate protection,” and the legislative history of the Board [Congressional Record vol. 134, House Conference Report No. 100-989, Sept. 28, 1988] at p. 488 explains why:

“Adequate protection” is the level of safety required of commercially licensed nuclear facilities. ... The conferees believe that it is appropriate to require the same general level of safety from DOE nuclear facilities as is required of commercial facilities. The conferees recognize that specific standards recommended by the Board for achieving adequate protection may not necessarily be the same as those applied to commercial facilities, to the extent that DOE and commercial facilities are significantly different.

As applied to commercial facilities, the standard of adequate protection means “reasonable assurance that the health and safety of the public will not be endangered by the operation of the facility. ... Absolute certainty or perfect safety is not required. What constitutes “reasonable assurance of adequate protection” is subject to change as the state of the nuclear safety art advances. The Board will be responsible for weighing such factors as technical feasibility, the risk of accidents, the record of past performance, the need for further improvement in nuclear safety, and other considerations. The conferees believe that such factors should be balanced by the Board when the adequate protection standard is applied.

This Report also quotes, at p. 489, from a case heard by the U.S. Court of Appeals for the District of Columbia, *Union of Concerned Scientists v. NRC*, 824 F.2d 108, 118 (D.C. Cir. 1987) which states:

NRC need ensure only an acceptable or adequate level of protection to public health and safety; the NRC need not demand that nuclear power plants present no risk of harm

The level of adequate protection need not, and almost certainly will not, be the level of "zero risk." This court long has held that the adequate-protection standard permits the acceptance of some level of risk.

Additionally, the Committee on Armed Services Report to accompany S. 1085, the *Nuclear Protections and Safety Act of 1987*, Report 100-232 at p. 20 states:

It is important that the Board be supplied with a sense of priority, and be focused on significant risks and consequences to public health and safety. . . . The Committee intentionally declines to go beyond establishing an adequate protection standard as a matter of policy and legislative intent, and renders no judgment as to the appropriateness of requiring "comparability" with particular commercial standards imposed by NRC.

From this background, there emanate several key elements in understanding "adequate protection" as it applies to defense nuclear facilities. First, the "adequate protection" criterion does allow for risk. Lawmakers understood that there would always be some risk present in the nuclear enterprise and that absolute certainty or perfect safety is an unobtainable standard. Second, what constitutes "adequate protection" will change with time, as the technology and our knowledge base change. Third, Congress established the Board (just as it did the Nuclear Regulatory Commission) using an informed and experienced group of nuclear field experts *for the very purpose* of weighing their differing views on what constitutes "adequate protection" in order to come to a balanced conclusion. In the final analysis, Congress declined to provide an objective definition of "adequate protection," instead deferring to the collective and subjective wisdom of the Board.

Every human endeavor involves risk. The only way to ensure no risk in an endeavor is to do nothing. But even the absence of such action brings with it risk. Not having a nuclear arsenal would guarantee zero risk to the public from that program, but what would be the national security risk to our republic without nuclear weapons in a world where others have them? Certainly not zero.

If we decision-makers accept the premise that we need a weapons program, even if it does bring with it some risk to public health and safety, then the next question we must answer is, "How much risk do we accept?" We aspire to use all of our scientific and mathematical tools of analysis and statistics to find an objective answer, but an objective answer always remains elusive, beyond our grasp. That means we must eventually be subjective, accepting that each human being has a different risk profile, and that every American places a different value on the importance, or even existence, of our nuclear weapons program.

We also know that there will always be a chorus of critics insisting that if the regulator, or in our case independent overseer, simply prevents engagement in risky behavior then no one will be harmed. We know that should something go wrong, we will receive blame. That creates concern on our part which can, and frequently does, lead to a regulatory mindset that too often results in our coming down on the side of less and less risk, with little concern for cost, both in dollars and in the effectiveness of the nuclear deterrent.

Congress long ago came to the conclusion that there is no easy answer to the question, "Is it safe enough?" That's why Congress, in its wisdom, established a five-Member Board: to provide a balance in competing views on an issue which addresses relative values, and is therefore as much a political question as it is a technical one. While all Board Members should have in common a technical background in the field, Congress expects that each Member will bring to the table his or her independent views in order to balance competing risk profiles. Coming to a conclusion on what is "safe enough" starts out as an objective analytical exercise, but in the end it includes the subjective balancing of the "gut feel" of the individuals on the Board. This is as it should be, for if adequate protection could be defined in strictly objective terms, Congress would have long ago done so and would have dispensed with the Board in favor of a single Administrator.

I support a strong national defense; one of the plainly Constitutional functions of our Republic's government. A key component of our defense is a strong, safe, secure and reliable nuclear weapons arsenal. I have also sworn an oath to our Constitution to abide faithfully by and execute the laws of the land. In my role on the Board, the specific statutory language at play is to ensure the Secretary of Energy is informed when the public is not adequately protected from activities and accidents within the DOE's weapons complex. I take that obligation most seriously. At the same time, I am sensitive to the reality that safety can be used as an excuse to constrain operations. I also know that humans, when given the power to regulate, or in the Board's case to advise, tend in the direction of more rather than less.

The Department of Energy's safety posture today is both excellent and in continuous improvement. I am convinced that the leadership and the workforce in DOE, both federal and contracted, actively embrace safety. I know from personal dialog and observations of their words and actions that the DOE political appointees and senior executives with whom I have had the most frequent contact hold nuclear safety sacrosanct and that they consider it their ultimate professional responsibility. I am completely confident that they not only believe that safety is vital to their operations, but that they have internalized and fully accepted that obligation. This is not a politically partisan characteristic. I have observed the same passion for safety in both the Obama and Trump Administrations. I consider that the nuclear weapons complex today, including both active and legacy activities, is one of the safest industrial undertakings in our modern world. But compared to what?

We are surrounded by risk. According to the Bureau of Labor Statistics, in 2017 there were 5,147 fatal work injuries, 887 from falls alone, and 123 from exposure to harmful substances in U.S. industry. Amtrak accidents killed 1 in 2018, 3 in 2017, and 8 in 2015. A 2016 train derailment of 14 cars just 2 miles from the Capitol at Rhode Island & 9th dumped toxic Sodium Hydroxide, ethanol and other substances into the city, another near-miss with no fatalities. A 2013 explosion at an ammonium nitrate fertilizer plant in West, TX killed 15. The BP oil disaster in the Gulf of Mexico, Deepwater Horizon, killed 11 in 2010. A 2008 explosion in a sugar refinery killed 13. A 2005 Texas City refinery explosion killed 15. While not occurring in the United States, the two recent crashes of American-manufactured Boeing 737MAX aircraft killed 189 in Indonesia and 157 in Ethiopia. Last year's Camp Fire in the Sierra Nevada foothills razed 14,000 homes and killed 85 people. Credit for this tragedy can be directly attributed to risks incurred by not implementing wild-fire-prevention projects because they were contrary to environmental regulations. And of course, most horribly, auto fatalities on U.S. highways killed 37,133 in 2017, which is a typical annual number. These are the tragic outcomes of real risks in America today.

Comparisons across industries are imperfect and metrics are elusive. While they don't directly cross-compare to threats to the adequate protection of the public from defense nuclear facilities, they subjectively help to inform my determination of relative risk. In the entire history of the DOE/AEC/Manhattan Project activities spanning over 75 years, there have been six fatalities which were unambiguously attributed to radiation exposures or traumas from accidental criticalities. The most recent of these occurred over a half-century ago. That is an exception record of safety.

Granted, I am only considering clear-cut acute fatalities, not other health effects from environmental challenges and low-level exposures that could possibly contribute to premature deaths. Doing so would quickly overwhelm us with subjective data and would embroil us in controversies such as the scientifically dubious linear no-threshold hypothesis. That notwithstanding, the orders of magnitude comparisons in non-acute health challenges are similar. The fact of the matter is that, for all of the fear and misunderstanding in the public domain, America's nuclear weapons complex has always been extremely safe when placed in the context of other hazards in our modern world, and today it is even safer than ever.

Please do not misunderstand me. The stellar nuclear safety record of the Department of Energy must never be taken for granted. Continual vigilance is the price paid for that record, and the Board's mission in that vigilance is as important as it ever has been. The superlative staff supporting the Board, the seriousness which I have observed that my fellow Board Members take their jobs, and my personal dedication, are indicative of that vigilance, even as in final decisions we come to differing conclusions on the threshold of adequate protection of the public health and safety.

QUESTIONS SUBMITTED BY MRS. DAVIS

Mrs. DAVIS. 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?"

Ms. GORDON-HAGERTY. 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.

Mrs. DAVIS. 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?

Ms. GORDON-HAGERTY. 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.

Mrs. DAVIS. 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"?

Ms. GORDON-HAGERTY. 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.

Mrs. DAVIS. 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?

Ms. GORDON-HAGERTY. 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.

QUESTIONS SUBMITTED BY MR. LARSEN

Mr. LARSEN. In fall 2018, DOE put forth a proposal to reconsider its interpretation of high-level radioactive waste under the Atomic Energy Act as amended and the Nuclear Waste Policy Act of 1982 as amended.

a. Why didn't the proposal include a role for the States or the Nuclear Regulatory Commission? Does DOE have concerns about involving NRC and the States in such critical decisions?

b. What is the status of DOE's consideration of this new interpretation?

Secretary WHITE. The Department sought public comments on its high-level radioactive waste (HLW) interpretation through its Request for Public Comment on the U.S. Department of Energy Interpretation of High-Level Radioactive Waste. DOE received a total of 5,555 comments, roughly 360 of which were distinct, unrepeatable comments, from a variety of stakeholders, including states and the Nuclear Regulatory Commission (NRC).

DOE appreciates the comments received from the NRC and the states and is taking their input very seriously. The DOE places significant weight on the NRC and state views of matters relating to the safe management and disposal of radioactive waste, including their views on the HLW interpretation.

The Department fully supports the NRC in its statutory and regulatory role with respect to regulating commercial nuclear activities (including licensing disposal facilities), as well as its historical and established consultative role to DOE on the disposal of certain reprocessing wastes. DOE intends to maintain its strong relationship with the NRC and will engage with the NRC on the best way to continue that relationship in the future. In addition, DOE currently works with states to satisfy existing regulatory agreements, and will continue that practice in regard to the HLW interpretation. The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis, to ensure compliance with applicable programmatic requirements and regulatory agreements.

DOE is in the process of evaluating public comments, and has not made any decisions at this time on the HLW interpretation.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. 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?

Ms. GORDON-HAGERTY. 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.

Mr. GARAMENDI. 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?

Ms. GORDON-HAGERTY. 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.

Mr. GARAMENDI. 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?

Mr. HAMILTON. The Atomic Energy Act obliges the Board to review the design of the repurposed MOX facility before construction begins and to recommend to the Secretary of Energy any modifications of the design that the Board considers necessary to ensure adequate protection of public health and safety. During construction, I expect the Board will periodically review and monitor construction and will provide further recommendations and/or advice. During startup and operations, I anticipate that the Board will continue to monitor the facility and make any necessary recommendations and/or advice. No plan is yet in place for each of these steps because the facility construction authorization, funding and timeline are just in development. I predict that oversight will begin at some point between the Department's establishment of Critical Decision 2 (Approve Performance Baseline) and Critical Decision 3 (Approve Start of Construction or Execution).

QUESTIONS SUBMITTED BY MS. HORN

Ms. HORN. Mr. Hamilton, in your testimony before the committee you stated that the Board's work during the ramp up of activity in the nuclear complex will make your job easier due to newer facilities coming on line to replace older Manhattan Project-era ones.

1. Please detail the specific facilities, including planned facility start dates, that are coming online that you believe will make the Board's work easier.

2. Is there not an increased Board workload from doing both safety oversight of current facilities, and ensuring future facilities are designed, built, and operated in a safe manner?

3. Further, with regard to DOE's Environmental Management work, how does the Board plan to do safety oversight as new facilities at Savannah River and Hanford come online?

4. How do you plan to incorporate all this additional work while reducing the planned number of Full-Time Equivalents (FTEs) from your FY2019 request of 117 to 100 FTEs for FY20?

Mr. HAMILTON. At Los Alamos National Laboratory: The Transuranic Waste Facility (TWF), operational as of October 2017, partially replaces waste storage on outdoor pads, leaving enduring missions in Waste Characterization, Reduction, and Repackaging Facility (WCRR) and Radioassay and Nondestructive Testing Facility (RANT); The Radiological Laboratory Utility Office Building (RLUOB, started chemical operations January 2014, started radiological operations August 2014, partially replaces Chemistry and Metallurgy Research Building (CMR), leaving some enduring missions to be relocated to Plutonium Facility; The Low-Level Liquid Waste Facility (LLLW), start operations November 2018, partially replaces The Radioactive Liquid Waste Treatment Facility (RLWTF), leaving the remaining mission to be relocated to another planned facility (Transuranic Liquid Waste Project); The Transuranic Liquid Waste Project (TLW), solicitation of bids for design and construction issued April 2019, to replace RLWTF functions not already transitioned to new LLLW Facility; Plutonium Modules, CD-0 approved in 2015 but the project was removed from the FY2019 Stockpile Stewardship Management Plan, if pursued, some activities from Plutonium Facility would be relocated to module(s).

At Pantex: The Material Staging Facility (MSF), planned to be Operational by 2040, or by 2030 if scope is reduced, would replace Zone 4 storage magazines for nuclear explosives and nuclear materials.

At The Savannah River Site: SRS Plutonium Processing Facility, retrofit of the unfinished MOX Fuel Fabrication Facility, planned to be operational at full capacity by 2030; The Salt Waste Processing Facility (SWPF), construction complete April 2016, currently undergoing testing and cold commissioning, start of operations projected by March 2020, based on the pilot projects Actinide Removal Process (ARP) and Modular Caustic Side Solvent Extraction (CSSX) Unit (MCU), which have operated for over 10 years.

At Y-12: The Uranium Processing Facility (UPF), construction started June 2016, partially replaces B9212, leaving enduring missions in B9215 and B9240-2E.

At Hanford: The Waste Treatment & Immobilization Plant (WTP) Pretreatment Facility, under design and under construction but activity was suspended 2012, start of construction July 2002; The WTP Low-Activity Waste (LAW) Facility, construction complete June 2018; currently undergoing testing and cold commissioning, start of operations projected by 2023, WTP High-Level Waste (HLW) Facility, under design and construction; all activity suspended 2012, start of construction July 2002; WTP Analytical Laboratory Facility, under construction, start of construction July 2002; WTP Low-Activity Waste Pretreatment System (LAWPS), design work suspended.

At Idaho National Laboratory: The Integrated Waste Treatment Unit (IWTU), construction complete; currently undergoing testing and cold commissioning, start of operations projected by 2020.

I do not agree with some who correlate the steep budgetary increase for DOE with increased challenges to the adequate protection of the public. This includes the new facilities at Savannah River and Hanford. In fact, I believe it to be just the opposite ... an inverse correlation. Increased funding for the weapons complex and the legacy environmental management means more built-in safety, not less. The increase funding goes to correcting maintenance backlogs, tackling aging infrastructure, replacing Manhattan Project-era buildings with modern construction, and replacing equipment which is worn out and has dated technology with modern, safer components. Those things come at a cost, but they make the complex even safer than it already is. This counter-intuitive situation is further enhanced as rising operational intensity increases learning. As production increases, for example, the workforce learns what does and doesn't work, improves the processes, procedures, and techniques, and develops much higher skill competencies. Consequently, it's my view that higher levels of production will be even safer than the current situation, which is already profoundly safe.

Board and Board staff oversight of existing facilities and the statutory mission to review facility design and construction is managed through the annual technical staff work plan. The plan allows the work load to be levelized through a timing, prioritization and ranking process which can be modified by the Board from time-

to-time throughout the year. While the Board is directed through statute to review design and construction, the level to which those reviews are conducted is left to the decision of the Board. The contemporary design and construction process is defined by modern and detailed codes and regulations, which means that the quality of the products are superior to the previous generation. As a result, I believe that the Board and Board staff reviews need not be as invasive as in the past. How much oversight is prudent will always be a subjective decision, but recent years indicate that the combined level of effort required to ensure adequate protection of the public health and safety for both existing and new defense nuclear facilities is well within the capacity of current agency size. Given that current staff (not including contract employees) consists of 88 full-time equivalents, a staff of 100 will be more than adequate to achieve the statutory mission.

