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House Armed Services Subcommittee on Strategic Forces Holds Hearing on Atomic Energy Defense and Safety

LIST OF PANEL MEMBERS AND WITNESSES

COOPER:

The subcommittee will come to order. Let's first ask for the Lamborn unanimous consent to allow full Committee members to ask questions at the end. Hearing no objection, so moved. You were close there. Larsen nearly objected.

Second, I'd 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 on to provide subcommittee more information if members request it. Rather than continue with my opening statement, I'll just ask that it be inserted for the record, and I would like to turn to the ranking member for his opening statement.

TURNER:

I'll do the same, Mr. Chairman. Thank you--submit my statement for the record. Thank you.

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.

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. 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'm 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 be submitted for the record.

COOPER:

So moved.

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 FY '20 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 provided a realistic--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 FY '20 budget request represents the largest increase for our nonproliferation, counter-proliferation, and nuclear counterterrorism program in five 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 combination of newly manufactured pits in 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 FY '20 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 and modernization across our enterprise. We have started construction of the main buildings of the uranium processing facility and the Y-12 National Security Complex.

And I'm proud to report that this vital undertaking has been on budget and on schedule for the last six 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 20 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.

COOPER:

Thank you. Ms. White.

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's 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 program. Since its inception, our dedicated workforce has cleaned and closed sites, dramatically reducing the 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 Oak Ridge 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--excuse me--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 and weights 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 provides.

That includes identifying impactful regulatory reforms and improving procurements through a new end-state contracting model. As EM is put on 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 Oak Ridge, the request advances construction on the Outfall 200 Mercury Treatment Facility, continues D&D at the East Tennessee Technology Park, and continues preparations to support processing the remaining U-233 material at the Oak Ridge 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.

COOPER:

Thank you, Ms. White. Mr. Hamilton.

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 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, am responsible for any deviations from the written remarks as well as for any responses to questions you may 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 FY 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 20.

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 bases 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 on 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 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 the 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 would--could preclude the Board from oversight for workers, co-located 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 14 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 headquarter staff.

The motion would have established an executive director of operations, restructure 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 head count through attrition to about 79.

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 back fill 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.

COOPER:

Thank you, Mr. Hamilton. I'll begin the questioning, and I'll try to just use my five 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.

GORDON-HAGERTY:

I am.

COOPER:

You are familiar?

GORDON-HAGERTY:

Yes.

COOPER:

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

GORDON-HAGERTY:

Well, I can speak to two recent studies.

COOPER:

We can't quite hear you.

GORDON-HAGERGY:

I'm sorry.

COOPER:

Can you pull the microphone closer?

GORDON-HAGERTY:

Is that any better?

COOPER:

Yeah, that's better.

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 a tritium study. I found their reports to be fulsome and very--the members of JASONs 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.

COOPER:

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

GORDON-HAGERTY:

My understanding is that the Pentagon is doing something with their contract. They do manage the contract--or administer the contract for JASONS.

COOPER:

Doing something with the contract--is that a euphemism for termination?

GORDON-HAGERTY:

My understanding--again, I haven't looked into it. I've actually asked my staff chairman to look into it to see what's happening because we do have some studies that we're undertaking with JASONS, 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.

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 site for a plutonium sustainment program, that second site being Savannah River. And it's my understanding that the life cycle cost of that would be an additional \$13 billion, \$14 billion if we undertake that second site. So, that's a large sum of money, especially given the size of your budget. That's 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 \$410 million for advanced design work on repurposing the MOX 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'll 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 of money here, a little bit of money there. Pretty soon you're 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?

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 the Nuclear Weapons Council to produce not less than 80 pits per year for our nuclear weapons stockpile--to maintain our existing nuclear weapons 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 stamp pits--for the United States was over two decades ago. We are trying to modernize and recapitalize that capability at Lawrence--excuse me, at 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--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're 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're 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 risks 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 a 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.

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--

GORDON-HAGERTY:

I'd be pleased to do so.

COOPER:

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's see if we can't save a bit here. So, I would at least like detail on the study, not just raw conclusions.

GORDON-HAGERTY:

Fair enough. And those are life cycle costs.

COOPER:

I understand that.

GORDON-HAGERTY:

Thank you, and I will be pleased to come by and brief you specifically about these efforts.

COOPER:

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

TURNER:

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

GORDON-HAGERTY:

That's based on needs set forth by STRATCOM and the Nuclear Weapons Council to produce not less than 80 pits per year, and that's for our future nuclear weapons needs.

TURNER:

Great. Thank you. Mr. Hamilton, when you began your opening statement-- and then I have a question for you. I just wanted to make a comment on your--you--in true oversight fashion, you gave what I think may be the first time I've 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'm going to bring up one of those. Ms. Gordon-Hagerty, so you have such unbelievable depths of responsibility because you're dealing with nuclear material and nuclear weapons. It's enormous, really, the complexity of what has to be done to ensure safety, ensure compliance.

My understanding is that you have received a letter, which I have a copy of, from Mr. Hamilton, March 21, the Defense Nuclear Facilities Safety Board, that raised a concern about the Nevada National Security site, stating, "The facility continues to operate without accounting for the increase in seismic hazard and without evaluating whether the credited structure, systems, and components can perform their safety function during and after a seismic event."

Could you do us the 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.

GORDON-HAGERTY:

Thank you. I'll be happy to. First of all, the Nevada National Securities site is a profoundly important site, one of the eight labs, plants, and sites that makes up the National Nuclear Securities 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 weapons 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 and the U1a tunnel at--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 Advice--at the Nevada National Security Site. Excuse me, I'm 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 weapons 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 resulting--is 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 in nuclear explosive operations. That is neither authorized nor 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.

TURNER:

Two more questions for you, and then I'll get to Mr. Hamilton on the same letter. The 76-2, of 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 deterrent strategy, and does it make the use of nuclear weapons more likely or less likely?

GORDON-HAGERTY:

First of all, we are in--I'm sure everybody would agree--we're in an era of renewed strategic peer competition and evolving threats. The 76-2 is not a new nuclear weapon. It's a low-yield nuclear weapon that is a modification of the 76-1 that was just completed. And it does not either increase or decrease 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 weapons stockpile.

TURNER:

But, 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?

GORDON-HAGERTY:

That's the ongoing argument. However, we have had low-yield nuclear weapons in our stockpile--and currently do.

TURNER:

And so far, we've 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 wrong, could this not go wrong, what do we need to fix?" With respect to this letter and her response, what are your thoughts?

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 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'd 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'd like to just to say the bottom line is that our concern was the NNSA's documentation needs to be refined based on new information.

But, there's 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--is what Administrator Gordon-Hagerty defined--for its current mission, DAF is unequivocally not a challenge to the adequate protection of the public health and safety. If it were, the board would have issued a formal recommendation, which we did not.

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.

COOPER:

Mr. Larsen.

LARSEN:

Secretary White, the budget cuts hampered cleanup by about \$400 million-- and wondering what assessment you have of the lower budget--the impact of cleanup operations and time lines at Hanford as a result of the lower budget.

WHITE:

So, we believe that the budget is adequate for our needs in 2020, and we're moving forward. We also had an update in our life cycle baseline cost estimate, and we're 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.

LARSEN:

Yeah, so your new life cycle report estimates the cleanup from--cost in between \$323 billion and \$677 billion. Is that about right?

WHITE:

That's--

LARSEN:

So, I could have given you that estimate. That estimate is a \$354 billion difference. And we're frustrated in Washington state with having to clean this up. We're frustrated with the federal government. And you're 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?

WHITE:

So, the higher number is what we call an 80 percent probability number, and what it does is it realizes some risks and--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 life cycle 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 have--we have to be transparent, and we have to know what we're dealing with, so that we can have fruitful discussions about the go-forward because we are committed to Hanford cleanup.

LARSEN:

Thanks. Is--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's a lot not to know, but given our collective experience here, there's a lot we already know. What don't we know that resulted in a 25 percent cut to the Richland Operations and the 12 percent to the ORP in this proposed budget?

WHITE:

So, I don't think the life--in fact, I know the life cycle baseline was not related to that.

LARSEN:

Yeah, right. I understand.

WHITE:

And 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 costs. So, I'm 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.

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. So, if you want my public comment, it's a frightening proposal.

You also note the Department's consideration of a new interpretation does not alter or abrogate the responsibilities or policies under existing regulatory requirements or agreements. How am I supposed to read that comment? Is it that it doesn't impact your existing regulatory requirements or agreements forever or until the 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'd be sitting on high-level radioactive waste that you--the federal government would consider not as high level radioactive waste.

WHITE:

So what we're doing is it's an interpretation, not a reclassification, and we--

LARSEN:

So, for--I don't know if there's a legal difference, but there's a common-sense difference in that. There's no--and in that, there's no difference to a lay person.

WHITE:

So, the--the issue with the high-level waste definition is that traditionally high-level waste is based on the source that created it. What we're doing is we're 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's a sound way to look at this problem, and it's not just for a minute that this definition won't abrogate our responsibilities. We have consent orders, we've got the TPA, there's Neetbuthers (SP), RCRA.

LARSEN:

Yeah.

WHITE:

So, we completely understand that.

LARSEN:

We will--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 as how it impacts Washington State. Thanks.

WHITE:

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

LARSEN:

I would welcome that.

WHITE:

I would like to.

LARSEN:

It probably wouldn't be just me, if you don't mind.

WHITE:

All right.

LARSEN:

Great, thanks.

WHITE:

Thanks.

COOPER:

Mr. Wilson.

WILSON:

Thank you, Mr. Chairman. And, Ms. Gordon-Hagerty--I thank all of you for being here today. Ms. Gordon-Hagerty, currently the Savannah River Site has excess weapons-grade plutonium. Thirty-four 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 plan time line cost for the dilute and dispose method over the next five years to remove the excess plutonium out of the site?

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 1, 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'm 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 of the end--by the end of December 2019.

WILSON:

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

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 plan--path forward, where we know we will be able to do so for less than the 20--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-20's. We will start to do dilute and dispose, a known technology, and we have used that technology for more than 5 metric tons of radioactive waste.

WILSON:

Thank you. And Ms. White, the H Canyon at the 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 now stored at site and additional materials the site continues to receive?

WHITE:

Yes. So, H Canyon continues to be a--somewhat of a maintenance challenge. We're working through those issues. And we've actually launched an independent project team to determine in what ways we could maybe increase operational efficiency and address raising production rates out of H Canyon. So, it's an extremely important facility to the United States. And as you note duly, it's the only one of its kind, so it's a very precious resource.

WILSON:

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

WHITE:

Yes, we are looking at different types of technology. There's 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've got--we'll have a lot to brief you on when that team gets done with its work.

WILSON:

Well, we appreciate again--H Canyon is just so critical for our country and want to make sure that it's 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?

GORDON-HAGERTY:

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

We're taking on what I would consider an unorthodox, very challenging way of looking at hiring practices. We are actually going--looking at a corporate ride 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're 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.

WILSON:

Well, Aiken Tech is an extraordinary facility. Thank you. Mr. Chairman.

GORDON-HAGERTY:

Yes, thank you.

COOPER:

Mr. Garamendi.

GARAMENDI:

I thank you, Mr. Chairman. And for the witnesses, thank you for being here-- 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?

GORDON-HAGERTY:

Representative Garamendi, we are--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're 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're 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 we-- it's our obligation to ensure our health and safety is sacrosanct at all of our defense nuclear facilities.

GARAMENDI:

But, you don't want anybody looking over your shoulder?

GORDON-HAGERTY:

No, sir, that' is not the case whatsoever. In fact, we have Defense Board staff--

GARAMENDI:

Well, that's exactly--excuse me. That's exactly what you're doing by limiting their authority and their opportunity to inspect the various facilities.

GORDON-HAGERTY:

Well, I would respectfully--

GARAMENDI:

You're limiting their authority and their ability to oversee your work.

GORDON-HAGERTY:

I would respectfully disagree.

GARAMENDI:

Why do you want to do that?

GORDON-HAGERTY:

We absolutely do not. We welcome the opportunity to work with the board.

We continue to work the board closely on every single opportunity, where it's appropriate.

GARAMENDI:

Do you agree with the board's assessment that your letter and your order is contrary to law?

GORDON-HAGERTY:

No, sir, I do not.

GARAMENDI:

Why do you think it is not contrary to law?

GORDON-HAGERTY:

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

WILSON:

Mr. Hamilton, why do you think it's contrary to law?

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 will also say that we've had three hearings on this topic, and we've 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--

WILSON:

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?

HAMILTON:

That is correct.

WILSON:

Okay, please continue.

HAMILTON:

And that's 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 (SP) oversight from Hazard Category 3 in radiological facilities. Hazard Category 3 in radiological facilities are something that the Department of Energy defines. They are not in the Atomic Energy Act.

Secondly, the order claims that 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.

WILSON:

So, they're watching themselves.

HAMILTON:

That's 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 the DNSFB and provide the DNSFB with ready access to facilities personnel's information that is necessary to carry out its statutory responsibilities. The language in the order leaves out the words, "as the board considers." Again, it's 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.

WILSON:

I haven't been around forever on this issue, but the years I've 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'll let it go at that. In my remaining 45 seconds--back to the 80 pits--you said that the 80 pits are required by the strategic--by the Department of Defense. Is that correct?

GORDON-HAGERTY:

Correct.

WILSON:

For what purpose?

GORDON-HAGERTY:

To maintain and modernize the current nuclear weapons--

WILSON:

No, no, for what--for what--specifically, for what weapons, for what delivery systems?

GORDON-HAGERTY:

For--currently, the W87-1, which is the 78 replacement, and for a number of other systems that we're working on right now. So--but, it's specifically the 87-1, which has an FPU of 2030 that we have to produce the pits for that weapons system.

WILSON:

And how many for that purpose?

GORDON-HAGERTY:

That number is classified, but I'd be happy to go in a closed session with you and explain--and have DOD with me.

WILSON:

I'd be happy to learn--I would be happy to learn--

GORDON-HAGERTY:

Thank you--

WILSON:

Specifically all the way down why you need 80 per year.

GORDON-HAGERTY:

Again--

WILSON:

It's 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.

GORDON-HAGERTY:

I look forward to that.

WILSON:

Yield back.

GORDON-HAGERTY:

Thank you.

COOPER:

Mr. Brooks.

BROOKS:

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 that secure nuclear material around the globe?

GORDON-HAGERTY:

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

BROOKS:

Yeah, but what else can you do with it?

GORDON-HAGERTY:

There are opportunities we can undertake. We can secure additional blood irradiators, some cesium sources where we're doing changes--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 radiological--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.

BROOKS:

Thank you. Ms. Gordon-Hagerty, new technologies are reducing the footprint and the detectability of proliferators and their attempts to acquire nuclear and radiological weapons. What type of technology such as 3-D

printing, worry you the most? How can NNSA and other agencies work together to combat these new threats?

GORDON-HAGERTY:

Three-D 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 inter-agency 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, 3-D printing and some other efforts are very alarming. Because they are available publicly, they present us with some challenges. So, therefore, what we're trying to do is also develop countermeasures against different types of--different types of challenges that we're encountering.

BROOKS:

Thank you. And lastly, in today's world where cooperation with Russia on nuclear security is difficult, what is NNSA doing to ensure we do not backtrack on global progress and nuclear security and counter-terrorism? 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?

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've 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 and multilateral position with the Russians.

BROOKS:

So, are you saying there's really limited initiatives that--

GORDON-HAGERTY:

At the present time, we are limited in our cooperation with them.

BROOKS:

Thank you very much. Mr. Chair, I yield back.

GORDON-HAGERTY:

Thank you.

COOPER:

Thank the gentleman. Mr. DesJarlais.

DESJARLAIS:

Thank you, Chairman Cooper, and thank the witnesses for being here today. A special thanks to our guests from Tennessee, who made the trip up-- 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?

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 in the uranium work that is undertaken exclusively at Y-12. With regard to our request for additional resources for the UPF--for 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'm glad to say that yesterday I was at Y-12, and I walked the site itself. And we've 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've got some other monies and resources going into the efforts that they provide in nonproliferation, counter-proliferation, counterterrorism.

DESJARLAIS:

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

GORDON-HAGERTY:

Yes.

DESJARLAIS:

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

GORDON-HAGERTY:

The biggest risks 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's really about the sustained funding that is necessary for us to complete this huge operation.

DESJARLAIS:

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

GORDON-HAGERTY:

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

The tritium--tritium, a vital component in our nuclear weapons system, decays as--radiologically decays--and so--radioactively decays in--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. And we have a great relationship with TVA, which is running our tritium bars, at which point they will irradiate the tritium bars, we'll bring them back to the Savannah River Site, they will extract the tritium, we will process the tritium and then take it to Y-12 where they will be inserted into the weapons.

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 to me 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, etc.?

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 weapon physicists, they are scientists, they are engineers, they are across the board. And that's not exclusive to Y-12 or Savannah River. It's at every one of our labs, plants, and sites. And like I said, we've 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.

DESJARLAIS:

Thank you for your testimony, and Mr. Chairman, I yield back.

COOPER:

I thank the gentleman. Ms. Horn.

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've 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?

HAMILTON:

We have had three hearings and provided two direct letters of correspondence to the Secretary of Energy on this topic. We have received one letter back after this first letter, so we have dialog 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's an annual first-year review of that order coming up. And I'm 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'm out--

HORN:

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

HAMILTON:

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

HORN:

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

HAMILTON:

I--that's a great question, thank you. I--I see actually very little direct risk to having our ability to access facilities and information and people because I don't--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 toolkit. 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.

HORN:

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

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

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 more--the money that's 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 don't--I see it as actually counterintuitive. The more money that the department is spending on enhancing facilities and modernizing them actually makes my job easier.

HORN:

And just one final question, as--as my--my time is about to expire, in--in this oversight if--if--if you're saying that it makes it easier, does it--does--do your concerns with the--the order 140 remain, if it stays as it is?

HAMILTON:

My--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 thru that if I have to. My real concern is that it's a--the--the wording, those four things that I--

HORN:

Yes--

HAMILTON:

Talked about are a direct--in my view, a direct contradiction from the plain language of the Atomic Energy Act. That's my real concern. I can--I can get through this. It might slow me down a little bit, but I have the statutory authority to get all that information.

HORN:

Thank you. My time is expired.

HAMILTON:

Thank you for that question.

HORN:

Thank you.

COOPER:

Thanks. Let's 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?

HAMILTON:

Yes, sir.

COOPER:

That's impressive.

HAMILTON:

Good.

COOPER:

Glad to know that. I didn't know that.

HAMILTON:

We try not to use it.

(LAUGHTER)

COOPER:

It's much better to be friendly. Now, I'd like to do a quick shout-out for Naval Reactors. I don't know--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 government agencies can learn--learn from that.

Next, regarding 810 filings under the Export Compliance Assistance Program. I wanted to ask Ms. Gordon-Hagerty when the subcommittee can get access to those filings.

GORDON-HAGERTY:

The Department is moving aggressively to provide that information, and--and I guarantee you that it will be done in the very near term. So--and--and that's what the team is--is actually pulling together. I believe that some of the staff have already been briefed on the 8--Part 810s to date, but we will be providing and being very responsive as--responsive as we can be to the committee.

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.

GORDON-HAGERTY:

Yes, I have made that request, and the lawyers are looking at that right now, as we discussed. They are--and I--I took your point, and we are looking into it right now.

COOPER:

Then, Ms. White, you were talking about thrift and saving money and 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?

WHITE:

So as you're well aware, the budget process is a process. We also have the big increase in our production rate of treating tank waste out of Savannah River due to the fact that our new treatment facility, SWPF, will be coming online.

COOPER:

So, that's the reason for the \$90 million?

WHITE:

Yeah, and what that--what that ultimately does is that it will greatly increase our--the rate at which we can remove that waste from those tanks, which ultimately decreases overall baselines. Thanks.

COOPER:

Unless, Ms. Davis would like to ask a question right--you're welcome to. Go ahead.

DAVIS:

Okay. Thank you, Mr. Chairman, so I do end up moving back and forth here, and--and unless this has--has already been asked, but I wanted to thank you all of course for--for being here, and anyone can add onto this question. If New START 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 NS--NNSA's nuclear modernization efforts. So, Ms. Gordon-Hagerty.

GORDON-HAGERTY:

At the present time, we are supporting New START and will continue to do so, and at some point in the future, a decision will be made whether or not we're going to continue with New START. That said, it's--I--I would say that it's not possible to actually determine what the modernization cost would be if we chose to increase our nuclear weapons stockpile, which is not in--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're considering.

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 US a credible response option and deters adversaries who might think the US 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 a credible response options. I don't find that terribly helpful, and--and I really wonder whether it could be interpreted in a--in a way that's far more dangerous.

Senior administration officials should not use this type of language. It weakens the credibility of the US deterrent. There are low-yield weapons, no doubt, but they are not low-level nuclear attacks. So, I hope that--you know, if you'd 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 suggest, and can you describe

how existing non-strategic nuclear weapons in the US arsenal impact the existing credibility? In other words, are the B61 and ALCM credible?

GORDON-HAGERTY:

All of our nuclear weapons in our--in our existing stockpile are credible based on different threat scenarios. However, the use of a--or the--the use--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--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're--we presently have them. This provides the--the Navy with use of submarine launch ballistic missile, a capability that we don't currently have.

DAVIS:

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

GORDON-HAGERTY:

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

DAVIS:

A low-level nuclear attack--

GORDON-HAGERTY:

Low-level nuclear attack. 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. 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.

DAVIS:

Would you--I--I think what--what's difficult here is that if we--if we were to make clear to our adversaries that there's no such thing as a low-level nuclear attack as--as stated here, and it's--it seems as if the--our allies would certainly read that as enormously escalatory and respond to us in--on that very basis if we think that, you know, that's where we're starting. So, I--I guess going back to, is there a threshold of a nuclear attack, at which you believe the current stockpile is not credible, as your testimony suggests?

GORDON-HAGERTY:

As I've suggested based on the nuclear posture review, the--it--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.

DAVIS:

And what--what would you call the next level after low--what would you call the next level?

GORDON-HAGERTY:

Deterrents.

DAVIS:

Thank you for your testimony.

COOPER:

Does the ranking member have an additional question?

TURNER:

Yes, thank you. So from low-yield nuclear weapons--I'm changing the topic to nuclear reactors, so I want to make certain that it's not confused. So on nuclear reactors, a low-enriched nuclear capacity for nuclear--for naval reactors. Could you speak about that for a moment, Ms. Gordon-Hagerty. Benefits, pros, cons, costs, and the like.

GORDON-HAGERTY:

So, to the extent that we would be using--I'm--I'm presuming you're referring to--

TURNER:

Low-enriched uranium--

GORDON-HAGERTY:

Low-enriched uranium. We have continued to study the capabilities to consider for naval reactors low-enriched uranium fuel. Highly-enriched

uranium fuel 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 versus high-enriched uranium.

TURNER:

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

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's 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're building today have life of the ship reactor.

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--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 to 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.

TURNER:

Is there an issue with the aggregate of waste produced, even though the waste would--would have different--

CALDWELL:

The waste would have different characteristics, and we'd have to deal--

TURNER:

(INAUDIBLE)--

CALDWELL:

With that. We'd have to engineer that, and that would require some change. The real issue is whether--you're not able to load the amount of energy in the core in the same configuration and get the same amount of lifespan out of it. So, you'd 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 billion dollars, 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--to transport to storage, and that could be literally billions of dollars on top of that.

TURNER:

Thank you for the clarification. I yield back. I'm not certain if Mr. Wilson (INAUDIBLE). Mr. Garamendi (INAUDIBLE).

COOPER:

Mr. Garamendi.

GARAMENDI:

I want to go back to the--I want to go back to the pit production. Perhaps, this will have to be done in a classified setting, but it was argued earlier that the pits were required for a new nuclear weapon, the IW-2. That is no longer in play, I understand. Instead, we are now building new pits or the W78. Is that correct?

GORDON-HAGERTY:

Yes, that's correct, and that's based on the fact that we have--we've 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 one that we've 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're calling the 78 replacement, which is the 87-1. In order to do so, it will provide us with a more robust system. These are not new nuclear weapons. They're just modernizing our existing nuclear weapons.

GARAMENDI:

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

GORDON-HAGERTY:

It is for the 78 replacement for the system for the Ground-Based--the GBSD, the Ground-Based Strategic--

GARAMENDI:

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

GORDON-HAGERTY:

Minutemen III--III.

GARAMENDI:

What's the total cost of that?

GORDON-HAGERTY:

That program will be--you have total life-cycle cost, Charlie? One second.

GARAMENDI:

Granted that you're not responsible for the missiles or the missile silos--

GORDON-HAGERTY:

No, sir--

GARAMENDI:

Or the commanding control system and all the rest. What is the cost of the W78 replacement, which I guess we now call the W87-1?

GORDON-HAGERTY:

W78--W87-1 modernization program, this year we're 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's the Deputy Director for--Deputy Administrator for Defense Programs.

VERDON:

So, right now, sir, it's in its very early stages, so we have a range of designs. The--the cost would range from 12 billion to an upper end of 15 billion, but that--you know, we'll be backing down and choosing the options that we actually implement on (INAUDIBLE)--

GARAMENDI:

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

VERDON:

It's a modification to the legacy 87 system, so the--the legacy--

GARAMENDI:

We're the ones that play games with words--

VERDON:

No, that's--that's officially what it's--it's--it's called a modification because it's based on the legacy 87 system.

GARAMENDI:

Okay, we won't get any further on that one. The Savannah River plutonium program is in abeyance. The disposition--the plutonium that's Savannah River is in abeyance. It's not moving forward. Is that correct?

GORDON-HAGERTY:

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

GARAMENDI:

And what is the plan for the disposition of the--

GORDON-HAGERTY:

The plan 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.

GARAMENDI:

And what is that?

GORDON-HAGERTY:

Total life cycle cost is \$18 billion over the entire life cycle.

GARAMENDI:

And what is it that you're doing?

GORDON-HAGERTY:

It's actually taking the materials--it's a very simple process actually. You're taking the plutonium waste, mixing it with the material where it cannot be re-used, and then, we will permanently and place it at WIPP, at the Waste Isolation Pilot Plant.

GARAMENDI:

Use--use your language correctly--

GORDON-HAGERTY:

I'm sorry--

GARAMENDI:

And carefully. You are spiking it so that it cannot be used as a weapon. Is that correct?

GORDON-HAGERTY:

Yes, sir, so that we cannot--no longer use it--

GARAMENDI:

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

GORDON-HAGERTY:

This material will be placed at the Waste Isolation Pilot Plant at--in New Mexico.

GARAMENDI:

Retrievable?

GORDON-HAGERTY:

It's--

GARAMENDI:

Yes--

GORDON-HAGERTY:

Put in salt--in 1,950--

GARAMENDI:

The answer's yes--

GORDON-HAGERTY:

Feet below ground in salt caverns

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.

GORDON-HAGERTY:

Yes, sir, like--

GARAMENDI:

Okay. Why are you not using any of the 34 tons of plutonium that now exists, and why are you then developing new pits?

GORDON-HAGERTY:

Sir, we are using our materials for defense-related needs for the--the pits--for the remanufactured pits for the 87 program. So, that's actually what we're doing when we're making these not-less than 80 pits per year. We're actually using some of the defense program's material that we have set aside. In fact, the half a metric ton that's currently staged at--at the Nevada National Security site will ultimately make its way to--to Los Alamos for use in the 87 pits.

GARAMENDI:

Thank you. I see I'm past my time. Thank you.

COOPER:

Mr. Wilson.

WILSON:

Thank you, Mr. Chairman, and--and again, what is your assessment of the need to repurpose the MOX facility for the plutonium pit production?

GORDON-HAGERTY:

The Department of Defense and the--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--at which point--several years ago, we conducted an analysis of alternatives and then eventually followed down 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 whinnied those, 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 the resilient and redundant capability, a capability that we have not had in this United States since the late 1980s, early '90s.

WILSON:

And so, you--the justification for the two-prong approach is--is you feel very clear.

GORDON-HAGERTY:

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

WILSON:

And have you done the cost analysis of Los Alamos, Savannah River site, as to not have a two-prong approach?

GORDON-HAGERTY:

Yes, sir, we have, and we will not meet the--there's--it's--it's challenging as it is. Let's be frank. 2030 is only 11 years away, and that's 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--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.

WILSON:

And I--I appreciate you--your clarity on this, and Ms. White, thank you for including in the budget the funding for the Advanced Manufacturing Collaborative 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 manufacturing but also assist the DOE complex by accelerating technology development through the clean-up mission. Can you comment on the importance of this facility and the success of similar facilities across the DOE complex?

WHITE:

Yes, so, the AMC project is very exciting, and it's allowing us to make some investments in Savannah River National Lab, which will be very important. That is EM's only lab, and--and EM operates it. And also too, when I looked at some of the 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's going to be, I believe, a lot of excitement around it, and that's something we need in EM just as in NNSA.

WILSON:

Thank you, and I yield back the balance of my time.

COOPER:

Thanks, gentlemen. 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 potential for a deflagration, a word I'd never heard of before. It would seem like by 2018 we should know how to store nuclear waste, and I know WIPP had a problem with the kitty litter, organic versus inorganic. Like why can't we get this right?

HAMILTON:

Thank you, Mr. Chairman. The four drums that you're talking about at the Idaho Advanced Retrieval Project that essentially exploded and were inside of a containment. Was a near-miss. The--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--there were, what I would say is, marginal records kept of what was in which drums that were buried, and so, there's some degree of uncertainty in what's 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 there--there--it's 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--this particular event, 90-plus percent of the drums that--that are being unearthed and reprocessed, over 90 percent are complete. This is the first event that occurred like this.

So, there's some risk in every operation that you're 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 repackaging 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's a very complex mix of unknowns.

And there's just some random opportunities in there for this kind of thing. It's 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 processes in place they think will mitigate it, and I think that--I think it will. Did I answer your question, Mr. Chairman?

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.

HAMILTON:

Just--

COOPER:

Zero--

HAMILTON:

For clarity--

COOPER:

As--

HAMILTON:

Just 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's a politically charged word that's not--

COOPER:

Well--

HAMILTON:

A good one to use, but it did pop out into that space.

COOPER:

We're 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 a 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?

HAMILTON:

My charter under the Atomic Energy Act and--and specifically under the legislative history is a recognition that zero risk is unattainable. That's--that's 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's--it's something approaching as good as we can get, and it's a subjective term, but I am not chartered to establish zero risk. That's 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's--that's certainly not an option. So, there is risk involved in everything we do. The question is, are we doing what's enough to adequately protect the public health and safety, and in my view, we are.

COOPER:

I think the real answer is somewhere between the 90 percent figure that you mentioned in your response and 99.99999999--

HAMILTON:

Well not---my 90 percent was how much has been processed.

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're not trying to cover up our own inadequacies, that we're not hiding the ball, and I--I was just surprised reading this in your testimony. I think your board does an excellent job, and we want to keep you in business. But I was just kind of struck 2018 stuff like this happens.

HAMILTON:

I don't think there has been any effort or intent to minimize this. As far as I'm concerned--

COOPER:

But what if WIPP gets shut down again for several years? You know, these are problems. We---Ms. White, you've been itching to talk.

WHITE:

Sorry, I just--we--we take these things very, very seriously at EM, and as someone who actually worked in the field and benefitted 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--it can never go to zero, although I really wish it could, and we--

COOPER:

Yeah, but we--we can solve the kitty litter problem. Like if inorganic kitty litter works, let's stick with that and not go with the organic kitty litter.

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--our efforts are substantial, and we take these things very seriously.

COOPER:

The Ranking Member?

TURNER:

I--I just wanted to say, first off, thank you for all of the expertise that you guys bring to bear in--in all aspects of our review and decision-making and discernment as to what paths we need to go in and how we need to correct what we're doing. Ms. Gordon-Hagerty, you said, workforce. It's not just your testimony today, it's 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's no margin of error here. I--Mr. Hamilton, I greatly appreciate your reality check of the statement of the mission that you have and that in--in part we look to you guys to--to be ingenuity, to create, to--to invent. As you're looking to our safety, you have to invent ways to create that safety. So, I--I--but at the same time, I commend you and--and greatly appreciate

the--what you're doing. I must agree with the Chairman here and 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 tasks.

COOPER:

Concluding note, unless the Ranking Member has a response to this. Just look behind you. Naval reactors. There's 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, you're back in time for the third round of questions, if you would like.

GARAMENDI:

You were just raising that hammer.

COOPER:

I was--I was poised. The witnesses are hoping that I'll hit the block.

(LAUGHTER)

UNKNOWN:

I'm--I'm hoping that you'll hit the block. I want to

GARAMENDI:

I want to go back to this new (OFF-MIC) I want to go back to the W87, and it's to be used as a replacement for the W78 for the new ground-based deterrent system. Why--well, let me put it this way, has an AOA 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?

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 over-arching--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-shelf fleet. We call them Mach 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.

GARAMENDIN:

In the appropriate forum, I want to go into that in much more detail, if you would--we'll have that, I'm sure, at some time in the future. Also, my understanding is there never has been a low-yield warhead on an SSBN submarine.

GORDON-HAGERTY:

That's correct.

GARAMENDI:

That's correct.

GORDON-HAGERTY:

That's correct. I think I--I stated that we had a low-yield--we had a low-yield weapon in our stockpile.

GARAMENDI:

Yes, you do.

GORDON-HAGERTY:

Yes--

GARAMENDI:

It's W--it's the 21. However, there has never been a low-yield ballistic missile or warhead on an SSBN. Is that correct?

GORDON-HAGERTY:

To my--the best--yes, correct.

GARAMENDI:

So, this would be the first time?

GORDON-HAGERTY:

Yes.

GARAMENDI:

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

COOPER:

It looks like there will not be a fourth round of questions.

(LAUGHTER)

COOPER:

Let the panelists rejoice. The hearing is adjourned.

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