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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2023
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED SEVENTEENTH CONGRESS
SECOND SESSION
SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FISCAL YEAR 2023 BUDGET FOR
NUCLEAR FORCES AND ATOMIC ENERGY
DEFENSE ACTIVITIES**

HEARING HELD
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**FISCAL YEAR 2023 BUDGET FOR NUCLEAR FORCES AND
ATOMIC ENERGY DEFENSE ACTIVITIES**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Tuesday, May 17, 2022.

The subcommittee met, pursuant to call, at 4:32 p.m., in room 2118, Rayburn House Office Building, Hon. Jim Cooper (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. JIM COOPER, A REPRESENTATIVE FROM TENNESSEE, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. COOPER. This hearing will come to order. I would like to begin by thanking our distinguished panel of witnesses. We look forward to your testimony.

We have the Honorable Jill Hruby, Administrator of the National Nuclear Security Administration; the Honorable Deborah Rosenblum, Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs; the Honorable John Plumb, Assistant Secretary of Defense for Space Policy; Vice Admiral Johnny Wolfe, Director of the U.S. Navy Strategic Systems Programs; and Lieutenant General James Dawkins, U.S. Air Force Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration.

I would like to ask unanimous consent that the remainder of my statement be inserted into the record.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 19.]

Mr. COOPER. I request the witnesses keep their opening remarks to no more than 5 minutes, and that members respect the same time limit for their questioning.

As members know, we are under some time pressure due to the pending cascade of votes, which I understand has been delayed a little bit. And if a miracle were to happen, we could actually complete the public portion of this hearing and get to the private session and complete that today. Otherwise, we will have to just do the public section today and then try to reschedule the classified hearing later.

I now turn to my ranking member, Mr. Lamborn, for any opening remarks that he has.

Mr. LAMBORN. And, Mr. Chairman, I, too, will ask that my statement be introduced into the record. And at that point we can go straight into questions.

[The prepared statement of Mr. Lamborn can be found in the Appendix on page 21.]

Mr. COOPER. Awesome. I knew I liked you.

Which witness would like to go first?

If you all are all right to discuss straight to questions, or do you want 5-minutes openings each? Would you like to do that?

Ms. HRUBY. If you would like, we can go straight to—I think we have—

Mr. COOPER. Right. Okay.

Ms. HRUBY. I think we have all been warned that you might want to go straight to questions.

Mr. COOPER. Okay.

Ms. HRUBY. But we also all have opening statements, so.

Mr. COOPER. Okay.

Ms. HRUBY. Your call.

Mr. COOPER. Well, if it is okay with members, including those on video, why don't we just go ahead and go straight to questions.

[The prepared statements of Ms. Hruby, Ms. Rosenblum, Dr. Plumb, Admiral Wolfe, and General Dawkins can be found in the Appendix beginning on page 23.]

Mr. COOPER. I thank the witnesses for being here. You represent a tremendous amount of accumulated knowledge and expertise, also a large portion of the Federal budget.

And I want to start with you, Dr. Hruby. What can we do to help you achieve your tasks, because NNSA [National Nuclear Security Administration] is under a lot of time pressure. You have a lot going on. What can we do to help, for example, quicken the pace of pit production, including getting South Carolina started?

Ms. HRUBY. Well, thank you, Chairman Cooper, for the question.

You know, we feel that the budget we have is nearly enough to do everything we can imagine doing. And, you know, regarding pit production, we are, we are planning to complete the design efforts, the 90 percent design of Savannah River, and the Los Alamos pit production capabilities in 2024. So, we will be working on it through 2023.

And we still have an objective to get to 2030 as close to possible on the Savannah River pit production facility.

Here is the request, though. We do have an unfunded letter that is associated with what we now see as real issues arising in the supply chain for things that we need in the Savannah River pit production facility.

So, we are requesting some additional funds that the NWC [Nuclear Weapons Council] is reviewing, we are reviewing this week, to allow us to do early procurements so that when the design is complete we can begin construction and not be interrupted.

Mr. COOPER. That sounds good.

I will turn it over to my ranking member, Mr. Lamborn, if he has questions.

Mr. LAMBORN. Thank you. I have several.

Administrator, I have another question for you.

Last fall, Secretary Granholm notified Congress that NNSA would be unable to meet the statutory requirement to produce no fewer than 80 plutonium pits per year by 2030. This notification triggered a separate legal requirement under 50 U.S. Code 2538 for the Nuclear Weapons Council to provide Congress with a comprehensive plan for getting the program back on track.

However, the Nuclear Weapons Council recently informed us that no plan would be provided.

As a member of the Nuclear Weapons Council, can you tell us why the council has chosen not to comply with this requirement to provide Congress with a plan to correct these deficiencies?

Ms. HRUBY. I think what we have in this question is maybe a misunderstanding.

Our intent is to, as a council, to make sure that we understand what we can do with the pits that we think are reasonable to produce in the timeframes to produce them. And the statutory requirement, as I understand it, is to say whether or not we will produce 80 pits per year by 2030.

I don't know if that is your question. But the council, I think, is fully committed to doing everything that we need to do statutorily. And if we are missing something—

Mr. LAMBORN. What it seems to me that we are missing is that since you can't reach that goal, what are you going to do instead to make up for that?

Secretary Plumb, do you want to throw in something?

Dr. PLUMB. Yes, Congressman.

So, aware of your—the statutory request is, how would we break glass to get to 2030 and get the 80 pits by 2030? Nuclear Weapons Council, including everyone here that sits in those meetings, we don't see any path to doing that. There are places where throwing more money at a problem just wastes money.

And so, instead, we are looking at what is the fastest way to get to 80. And we are waiting for a critical design review. I think Under Secretary Hruby or Assistant Secretary Rosenblum could speak to that, that will give us more and better fidelity on where to get to next and how fast we can do it.

Ms. ROSENBLUM. Yes, Congressman. As the staff director for the Nuclear Weapons Council, I can elaborate a little bit.

There were two letters that were combined that was sent from the NWC chair: one that spoke to the pit production, which you've just gone over now, in terms of not being able to reach that by 2030; coupled with, then, a discussion about the budget certification, and whether there was a need for additional monies in order to meet, actually, 2030.

What the NWC is doing now is they are working very closely between Department of Energy [DOE] as well as Department of Defense to look at where there may be some actions that can be taken by DOE that will bring it as close as possible to 2030. And that work is underway right now, and will be through the summer. And we are expecting to have some initial recommendations by early fall when it comes time to be producing some of the guidance.

Mr. LAMBORN. Okay. That does help me understand better, although I do want to have the comprehensive plan that is called for under the laws that we've passed here in this committee.

Ms. ROSENBLUM. Understand.

Mr. LAMBORN. Secretary Plumb, I have a couple questions on the B83.

The rationale of this administration to retire the B83 gravity bomb without a replacement capability is not clear to me. In fact, it is my understanding that not only is there no replacement capa-

bility, but the process to identify candidates for a replacement capability has not even yet started.

However, the hard and deeply buried target set remains a requirement for Admiral Richard and U.S. Strategic Command.

How does the administration justify removing this capability from our strategic arsenal, which will effectively prevent our military from achieving its deterrence requirements?

Dr. PLUMB. Thank you, Congressman Lamborn.

So, I look at this problem as actually two separate problem statements. The first question is what about the B83? The second question is hard and deeply buried targets.

So, let me start with the second.

Hard, deeply buried targets are a problem. It is a problem we are committed to solving. And we have a study underway, I believe, for that. And that is an ongoing conversation we are going to have to have with this committee and within the Department to figure out how to solve it, because our enemies are digging deeper and harder.

Separate problem, B83. Does not solve all these issues, so it is of increasingly limited utility. And retiring it does not change the hard and deeply buried target problem set.

A lot of this conversation I am afraid we have to defer to the classified session, whenever we have that.

Mr. LAMBORN. Okay. Well, I want to follow up on that part of the issue. And I want to raise a side issue with the B83.

I realize that there is a smaller target set, given advances in our defenses. However, that target set still does exist. And a critical part of our deterrence posture is ensuring that our competitors don't think that they have an advantage based on perceived capability gaps.

So, this decision codifies a capability gap and creates an opening for them to consider exploiting. I don't think we should give them an inch when it comes to our deterrence posture. And this also would include the administration's decision to cancel or stop funding the SLCM—SLCM-N [sea-launched cruise missile-nuclear] program, even though Russia has fielded a similar system for years.

So, why not develop a replacement plan to go after hard and buried targets before retiring the B83?

Dr. PLUMB. So, Congressman, we have a time phase problem with the way you just phrased that. Again, the hard and deeply target problem set is something we are focused on. The B83 doesn't give us that solution for—

Mr. LAMBORN. It may not give a complete solution.

Dr. PLUMB. Yes, sir.

Mr. LAMBORN. But it gives a partial solution more than we have otherwise.

Dr. PLUMB. Of increasingly limited value.

Mr. LAMBORN. But right now it is a better solution than anything else out there on the table in our, in our arsenal.

Mr. COOPER. If the gentleman would yield, we might be able to discuss this more fully in closed session.

Mr. LAMBORN. Okay. Let's—

Mr. COOPER. Does the gentleman have other questions?

Mr. LAMBORN. No, that is it. Let's do that.

Mr. COOPER. Mr. Moulton.

Mr. MOULTON. Mr. Chairman, thank you. I have just one question, but it is a philosophical question that I think is actually important for the American people to hear. And I would invite any one of the five of you to, to answer it.

Over the next 10 years we are going to spend \$634 billion on modernizing our nuclear arsenal. Not building a nuclear arsenal, because we already have quite an extensive one, but simply modernizing a way to wipe out all human life on this planet.

I sit on this committee because I understand that it is important. But how would you explain to your kids why we are making this kind of investment?

Yesterday, it took me exactly 12 hours and 5 minutes to go the 450 miles from Boston to Washington. Why? Because our entire transportation system breaks down due to a thunderstorm. We are the only developed nation in the world that doesn't have high speed rail, which would have a train every 20 minutes that takes 3 hours to go from Boston to Washington.

And with \$634 billion in 10 years, you could connect every city in the Nation with 250-mile-per-hour trains.

The point is, we are making serious trade-offs to invest this kind of money in our nuclear arsenal. Someday my 3-year-old's going to ask, Why were you voting for this, Daddy?

How do you explain this to your kids?

General DAWKINS. Can you hear me? Is this on?

Mr. MOULTON. Yes, we can. Thank you, General.

General DAWKINS. So, what I would tell my children is that it is a dangerous world. It is increasingly more dangerous, as we have seen what has happened with Ukraine, as we hear about the strategic breakout with China, of course North Korea and others.

Those countries seem to value nuclear weapons quite a bit. In fact, they have all, with the exception of North Korea, of course China has now developed a triad. And Russia has had a triad for years. They are not stopping any of their work on new types of weapon systems.

And what we found through the years is the best deterrent to prevent a nuclear conflict from happening is to ensure that what we have on the United States side is safe, secure, modernized, and credible.

And so that is what I would, I would tell my children, so I do tell my children. And that if we were going to have a triad, which the administration and previous administrations have decided that we will, that we have got to make sure whatever we put into the field remains safe, secure, reliable, and credible.

Mr. MOULTON. Admiral.

Admiral WOLFE. So, I would echo what General Dawkins said. And I would also, sir, point out that you made the point we have an extensive triad as it is today. That is a true statement.

But if I could add on to what General Dawkins said, but to be credible, safe, and reliable, these systems age out. So, we are not asking to go put exquisite new systems in place. We are not asking to go build to new requirements. We are just asking to modernize what we have got today because over the last 50-plus years it has proven it works.

But it has got to be reliable and credible. Because it is not about what we believe, it is a what, it is what Russia and China believe. And the day they believe that our systems don't work and they are not credible is the day that they may ask the question: Is today the day?

So, that is exactly why we are asking to modernize what we have got. Not increase, not grow numbers, it is just modernize what we have today because we have proven throughout time these systems perform exactly what we want to perform, which is deterrence, credible deterrence from anybody ever challenging our way of life.

Mr. MOULTON. Anyone else?

Ms. ROSENBLUM. I would just add that, you know, in building on what has already been said here, that the administration took a hard look at this issue and looked at the threat picture and where our adversaries are expected to be 10, 15 years from now, and felt that that certainly merited a decision to fully fund the triad. And that is what is in the President's budget.

Mr. MOULTON. Thank you, Mr. Chairman.

I yield back.

Mr. COOPER. Thank you. The gentleman's time has expired.

Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman. And, again, Mr. Chairman, we are going to miss your service, but we wish you well in the future.

Mr. COOPER. Thank you.

Mr. WILSON. With that, Secretary Hruby, I really appreciate your service. As a former deputy general counsel myself of DOE, where I had the great opportunity to serve with the very legendary Eric Fygi, who retired last Friday, he has just been an inspiration of service to our country. And he will be missed.

Secretary Hruby, in your letter to the House Armed Services Committee you stated that the President's budget request of NNSA is \$500 million below the requirements-based budget submitted by DOE. This additional funding would allow activities to be started as early as possible for the Savannah River Plutonium Processing Facility, and support meeting the requirements of 80 pits per year as close to 2030 as possible to achieve peace through strength, as a deterrent to Putin, Chinese, Iranian, and North Korean modernization.

Can you break down the \$500 million figure for the NNSA unfunded priorities letter?

What is the plan to spend, and how this additional funding will help mitigate risk?

What are the challenges to the current trajectory of getting to 80 pits per year if this funding is not obtained?

Ms. HRUBY. Thank you, Congressman.

The \$500 million request is largely to purchase equipment that will go in the Savannah River pit production facility and allow us to build 80 pits per year after the construction is complete.

What we have found in other large construction projects, particularly the Uranium Processing Facility, is that—and with COVID, is that there are some pieces of nuclear qualified equipment and glove boxes that are taking a very long time because, in part, because we are doing so much modernization.

And so, what we would like to do is specify and procure some equipment earlier. This is essentially bringing up costs from later in the program to earlier in the program so that it will be, we will be able to do construction as uninterrupted as possible.

Mr. WILSON. Thank you very much.

And, Madam Secretary, I am grateful for the news that the high winds around Los Alamos National Security Laboratory have subsided, allowing firefighters to battle back against the deadly brush fires in the area. This underscores the need to solidify a two-site solution for plutonium pit production which would provide redundancy in the event of further unexpected events that could shut down this crucial part of our nuclear deterrence strategy modernization efforts.

What other benefits does the two-site solution provide that mitigates risk and prevents delays to our crucial nuclear modernization needs?

Ms. HRUBY. Yes, thank you for that question.

And we have said all along that we believe this two-site solution does two, two things. It is the most efficient and cost-effective approach because we can take advantage of a qualified nuclear facility that was the shell that was already constructed for the mixed metal oxide facility. And we, and we will get resilience.

There are other things that can, you know, any accident, even if it doesn't, you know, hurt people, we have to investigate completely when it involves plutonium. Any security breach, there are a number of things that could happen that could close a plutonium facility while being investigated or while being fixed.

But the fires are a good example of why resilience is so important in today's world.

And, yes, so thank you for that question. But we think this is both cost-effective approach, best utilizes talent, and provides the most resilience.

Mr. WILSON. Thank you for your insight.

And, also, I want to thank you for highlighting the importance of cybersecurity at our nuclear facilities in your testimony. I am grateful that the efforts of the Adjutant General Van McCarty of the South Carolina Guard, and Chancellor Daniel Heimmermann of the USC [University of South Carolina] Aiken for investing in the DreamPort facility, which will partner with industry and defense to train the next generation of cybersecurity experts.

What are the challenges faced by NNSA for recruiting and retaining high-performing cybersecurity professionals?

Ms. HRUBY. Yeah. I think the challenges we have are similar to the challenges in other areas. But this is a highly paid profession in great demand.

So, we have to—I always, the first thing we have to do is get people who really care about the mission. We can't forget to stress the mission. People get to do incredible work for the American people when they protect our systems from cyber.

And, secondly, we have to pay competitive, as close to competitive salaries and benefits as we can, at least fair salaries and benefits, so that we can attract these people.

So, we are doing everything we can to get people hooked on our mission as early as possible in their education. And everything we

can to convince them to stay once they have come. But it is a challenge.

Mr. COOPER. The gentleman's time has expired.

Mr. WILSON. And in my State, I'm working with Congressman Rick Allen in Georgia in South Carolina. Thank you.

Mr. COOPER. The gentleman's time has expired.

Mr. Morelle.

Mr. MORELLE. Thank you so much, Mr. Chairman.

I just want to start by saying my district is home to the Laboratory for Laser Energetics, LLE, at the University of Rochester, a key part of the NNSA's Inertial Confinement Fusion program, which is a critical component of the Stockpile Stewardship Program that maintains a safe, secure, and effective nuclear deterrent.

I am glad to have the opportunity to discuss this program in the fiscal year 2023 budget. Which leads me to my question, Madam Administrator.

The NNSA's Inertial Confinement Fusion facilities, like the one I mentioned in my district, are the only facilities capable of accessing and studying the high energy density conditions responsible for 99 percent of the yield of our nuclear devices. And, as such, they are a crucial component of the Science-Based Stockpile Stewardship Program that underlies our, underlies our confidence in the safety, reliability, and effectiveness of our nuclear stockpile.

Despite the ICF [Inertial Confinement Fusion] program's critical role in our national security, and strong support from this committee and from the Congress, NNSA, excuse me, has routinely requested harmful cuts in the program in the President's budgets request, including again this year.

So, I wonder if you could just describe how the proposed cuts impact our Nation's high energy density science capabilities and NNSA's ability to fulfill its stockpile stewardship mission now and in the future?

Ms. HRUBY. Well, thank you.

As you have stated, our ICF, our Inertial Confinement Fusion program is very important to our Stockpile Stewardship Program. And the three facilities—your facility, OMEGA; the National Ignition Facility; and the Z machine—all contribute to that mission.

Our request is, we believe, a balanced request, it's the same request as in fiscal year 2022 for this, for this program and the facility. We do have a lot of things on our plate. We want to maintain the science, but we have to balance that with all the deliverables.

We have an infrastructure modernization and weapon modernization. So, we are fully committed to continuing to fund the Inertial Confinement Fusion program, the Laboratory for Laser Energetics, and the OMEGA facility. But we are just doing it in a balanced manner.

Mr. MORELLE. Well, we may, I may continue to raise this with you and continue to talk to committee colleagues about that.

I do want, also, just, if you could just further comment on the request notes that the ICF facilities are aging and will need significant investments to sustain them. A point I have also raised before and Congress has requested the NNSA provide a strategic plan for recapitalizing, upgrading, and maintaining the major ICF facilities.

Can you provide a sense of when NNSA may provide that plan, what level of resources will be needed to meet the sustainment requirements?

Ms. HRUBY. Yes, thank you.

We do—we are, we are developing the 10-year ICF facility and infrastructure plan. And we have, you know, we are, actually, with the new Assistant Secretary for Nuclear Security, the Deputy, we are—Marv Adams, we are, we are talking about this every day, actually. How are we going to get the money to sustain our science facilities? Why we need so much money to do our production modernization program?

We appreciate being asked for a plan, and we are working on it.

I am sorry, I will have to get back with you on a date. I don't have a date I can promise today.

Mr. MORELLE. And just really quickly. You personally outlined challenges confronting the NNSA workforce and the need to meet mission requirements and deliver on objectives. We have 400 scientists, engineers, and staff just at the LLE. And we train students in inertial confinement fusion, and high energy density physics. We play a critical role in attracting talent.

Can you talk a little bit about what you intend to do to try to not only achieve workforce needs, but also promoting expansion of the workforce so that it promotes racial and economic equity within that workforce?

Ms. HRUBY. Absolutely. We have, we have a lot of university programs. We are very proud of the minority-serving education programs that we have.

We, in fact we just, we are concerned about all elements of our workforce, from crafts and technologists through Ph.D. scientists. And LLE serves a very important purpose for creating scientists.

And we are also looking to continue our MSIPP programs, the Minority Serving Institution Partnership Programs, and education programs. And today we just announced a \$5 million program aimed at technology, crafts, and crafts workers.

Mr. MORELLE. Thank you, Mr. Chair. I apologize for going over, but I yield back.

Mr. COOPER. Yes. The gentleman's time has expired.

Mr. DesJarlais.

Dr. DESJARLAIS. I will try to ask punctual questions and hopefully get the same answers, Ms. Hruby.

Last year Congress increased the minor construction threshold to \$25 million. How helpful was that?

Can you just outline a couple successes? And how would you benefit if we were to do that even more, such as Mr. Verdon, your predecessor, had asked for?

Ms. HRUBY. Yeah, thank you. And thanks so much for increasing this threshold.

I actually got some statistics on this. We, since 20—since we changed the level from \$10 million to \$20 million, we have completed 16 projects, and have 43 new projects underway, and 10 proposed for fiscal year 2023.

If we raise—with the threshold at \$25 million now, two projects are underway and two projects are proposed for 2023. I am a big fan of these minor construction projects because we can streamline

them. They are much more efficient, they are much faster. And I think the higher threshold is an innovative way to help us with office space, with general laboratory space, and non-nuclear construction.

And really appreciate the support that has been provided. And would love to see it go even higher.

Dr. DESJARLAIS. Okay. I can probably guess the answer to this.

Just in follow-up, with inflation at 8 percent and construction material soaring 20 percent or more, would you be supportive of pegging the minor construction threshold to the inflation rate so you don't have to come back every year or two to make the same ask?

Ms. HRUBY. I would like that. I mean, from my perspective, if we could get it to the right level and then increment it by inflation, that would be perfect. And I would suggest a level above \$25 million before we start incrementing for inflation is worth a look.

Dr. DESJARLAIS. Okay. And General Dawkins, if you had to describe one thing that is obstructing your ability to do your job successfully, what would that be?

General DAWKINS. I don't know that it is obstructing our ability to do it right now. But it is clear, consistent, and stable funding.

As we move forward into the nuclear modernization bow wave it is more imperative that we are able to have new starts. And with inflation coming in as well, that is an important piece there.

So, basically, the less, the less CRs [continuing resolutions] we can have, the much better place we will be, particularly with regard to MILCON [military construction], GBSD [Ground Based Strategic Deterrent] MILCON—or Sentinel, I'm sorry. MILCON is such a big part of Sentinel.

But, again, all of these programs are coming, starting to ramp up at the same time. And it is critical, we don't have any margin left to delay programs. So, I would say consistent, stable funding with your support.

Dr. DESJARLAIS. Okay, thank you.

I yield back.

Mr. COOPER. I thank the gentleman.

Mr. Garamendi.

Mr. GARAMENDI. A lot of questions need to be asked and answered.

With regard to the Sentinel, General Dawkins, we need detailed information. You just mentioned MILCON. At the moment it's—the detail needed, is not available. Please provide it.

There was a discussion, General Dawkins, you said this, but this goes to all of you, you are talking about a bow wave. The last time the bow wave was discussed here was at least 5 years ago. I have not seen any recent updates based upon inflation and other matters. I would like to have that. So, please, if you would, if not to the committee, at least to me.

Also, Ms. Hruby, what, how many pits can be produced at Los Alamos?

Ms. HRUBY. Our goal is to produce 30 pits per year reliably.

Mr. GARAMENDI. When will they be? When will you reach that production level?

Ms. HRUBY. 2026.

Mr. GARAMENDI. 2026.

General Dawkins, when do you need the 87-1 to put on your new Sentinel?

General DAWKINS. Sir, the Sentinel field—will field with the 87-0 IOC [initial operational capability] of 2029.

Mr. GARAMENDI. Okay. Does that 87-0 need new pits?

General DAWKINS. The 87-1 will field in 2030—

Mr. GARAMENDI. The answer is the 87-0 does not need a new pit.

General DAWKINS. The 87-0 does not need, not need a new pit. The 87-1 requires the pits. And we are working with the Nuclear Weapons Council and NNSA to ensure that we—

Mr. GARAMENDI. I don't have much time. Just, just the answer to the question, please.

So, the 87-1 requires a new pit. When do you need the 87-1?

General DAWKINS. We are planning to integrate it in 2030.

Mr. GARAMENDI. 2030. And how many will you integrate each year beginning in 2030 for the next decade?

General DAWKINS. Sir, I don't have that information with me. I can certainly take that for the record and provide that.

[The information referred to can be found in the Appendix on page 87.]

Mr. GARAMENDI. Please do.

The point here is, if you are able to produce beginning in 2026, 30 per year, by 2030 you will have how many? A hundred and twenty in stock, right? And then each year thereafter you will produce 30.

Will you repurpose more than 30 per year in the decade 2030 to 2040? The answer is probably not. And, therefore, why do you want to spend \$500 million on Savannah River when, in fact, we don't need Savannah River to meet the 87-1 pit production.

Ms. Hruby, your question; the answer, please.

Ms. HRUBY. Yes. Well, all, the reason that we are making new pits, all the pits in the stockpile are aging. The pits in the stockpile were last produced—

Mr. GARAMENDI. Okay, so specifically tell me which pits and which weapons will you be needing new, which weapons will you be needing new pits, and when?

Ms. HRUBY. Yeah. Sir, that information we are still developing as Nuclear Weapons Council. But if we sustain the stockpile for another 30 years or more, which I, it kind of looks like we are doing, we will need more pits than the 87-1.

Mr. GARAMENDI. So, with the next 30 to 50 years we are going to start—we need Savannah River now, and you need \$500 million now because you might need—you do, you clearly do not need Savannah River to produce the pits necessary for the 87-1. If there are other weapons that need pits, please deliver that specific information.

Ms. HRUBY. We will.

Mr. GARAMENDI. And a general question in the next 1 minute.

What does it take for deterrence? What does it take for deterrence? Triad? A new Sentinel? *Columbia*-class submarines? What does it take?

I have never heard a rational answer to that question. I have heard history, which you just gave us: well, for 50 years it has worked.

What does it take? Be happy to have a discussion later. My time is about to expire.

But until we have a clear answer to that question, and don't tell me because it worked for the last 50 years it is going to work for the next 50. I don't buy that.

I yield back.

Mr. COOPER. The gentleman's time has expired.

Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman. Can you hear me okay?

Mr. COOPER. Yes.

Mr. LANGEVIN. Okay. Thank you, Mr. Chairman.

I want to thank our witnesses for their testimony today. I wish I were there in person.

But let me begin following on the deterrence issue. And my question, as we know, nuclear deterrence operations do not take place in a vacuum. I want to know how is the Air Force thinking about other capabilities, like cyber, space, conventional capability, et cetera, when it comes to integrated deterrence.

Dr. Plumb, that is probably a question most appropriate for you.

Dr. PLUMB. Thank you, Congressman Langevin.

So, I want to be clear, integrated deterrence is very important. It is how do we get the most out of our capabilities and the most deterrence function out of all. It does not reduce the role of nuclear weapons as a bedrock of our deterrent function.

But when you mention the different functional offices, several of which I have, you know, policy responsibility for, I think they all come into play in 21st century warfare.

As we look at China on the ascendancy, as our pacing challenge. The ability to deliver effects both in cyber and in space, and using nuclear, our nuclear deterrent is our kind of bedrock to prevent a nuclear-level conflict.

I think they are all important. They all need work, as you know, from our other hearings as well. And I believe the entire Department would agree that we are pushing hard on all of those things. Those are all functions that we need to be well invested in and have the right personnel, and the right training, and the right equipment.

Mr. LANGEVIN. And how are we broadcasting that to our enemies and adversaries so that they understand what our posture is?

And let me ask you this: How has the Russian Federation's invasion of Ukraine affected your perspective on integrated deterrence?

Dr. PLUMB. Thank you. I would suggest that the answer to those two questions is the same. We are seeing a version of integrated deterrence every day in the way Russia is being bogged down in Ukraine; the way we have been able to raise allies across NATO [North American Treaty Organization] in support of supplying Ukrainians with weapons and information; the way we are using our intelligence and our cyber and our overhead assets for imagery, to declassify and release information ahead of the Russian intent,

to basically not allow them to weaponize the information sphere. These are all related.

I think it is, obviously, early in this approach. But, so far what I see is effectiveness. And I see it is a learning curve for the Russians, learning some for us. And I also believe China is watching and getting the message as well that you shouldn't be messing with us.

Mr. LANGEVIN. Ms. Hruby and Dr. Plumb, let me turn to something else with respect to cyber.

As with any part of our nuclear triad, we must absolutely ensure that we have robust cybersecurity practices in place. I want to know how are your organizations ensuring that we have cyber baked into our nuclear capabilities?

Dr. PLUMB. Yes, sir. Absolutely, cyber is absolutely important. And as you know well, you know, cyber warfare is just at its beginning. And so, baking in robust cyber defenses, not just as a perimeter but in depth, is absolutely essential.

And, of course, that extends to our nuclear infrastructure, not just the weapons themselves but our platforms, and also our, you know, NNSA has already spoken to that. It is part of every meeting that I am in.

Ms. HRUBY. I would just add from the NNSA perspective that while we have been working on cyber and enterprise assurance, this, the 2023 budget calls it out as a separate project activity and separate line item. So, it will be quite visible. And you will see a sustained effort on our part.

Mr. LANGEVIN. Yeah. Absolutely critical going forward.

The last thing I will ask, and this may have go to the record.

Ms. Hruby, I am concerned about issues that I've heard with respect to recruitment and retention from several nuclear weapons labs. How are you working to retain that top talent? And what can Congress do to help?

Ms. HRUBY. Yeah, very briefly.

First, it is a problem.

Second, we continue to think mission is our biggest asset. But we are doing—we offered this year to our M&O [management and operating] contractors a mid-year salary adjustment to try to keep pace with inflation and stem attrition. We are looking at benefits packages.

And we hope you will support our efforts to stay competitive.

Mr. LANGEVIN. Very good.

Thank you, Mr. Chairman. I appreciate the witnesses' testimony today. And I yield back the balance of my time. Well, time has expired.

Mr. COOPER. The gentleman's time has expired.

We are about 25 minutes into the first vote in a long series. So, we will not have time to move into closed session, as I had hoped.

Unless there is an urgent question from a member right now, I plan on adjourning this hearing.

Is there an urgent question from any of our colleagues?

If not, then I want to thank the witnesses. I regret the inconvenience. I appreciate my colleagues who showed up for the hearing coming. And I look forward to rescheduling the closed session,

which I have always found to be more valuable than the public session.

So, hopefully we can find a time that is convenient for everyone. And, hopefully, no votes will interfere in that closed session.

So, I thank the witnesses. The hearing is adjourned.

[Whereupon, at 5:14 p.m., the subcommittee was adjourned.]

A P P E N D I X

MAY 17, 2022

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MAY 17, 2022

Statement of Hon. Jim Cooper
Chairman, Subcommittee on Strategic Forces
Hearing on
Fiscal Year 2023 Budget for Nuclear Forces and
Atomic Energy Defense Activities
May 17, 2022

This hearing will come to order. I would like to begin by thanking our distinguished panel of witnesses for testifying today. We look forward to hearing from the Honorable Jill Hruby, Administrator of the National Nuclear Security Administration, the Honorable Deborah Rosenblum, Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, the Honorable John Plumb, Assistant Secretary of Defense for Space Policy, Vice Admiral Johnny Wolfe, Director of U.S. Navy Strategic System Programs, and Lieutenant General James Dawkins, U.S. Air Force Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration.

Unfortunately, the world continues to become more dangerous with regard to nuclear weapons. Since this hearing last year, Russia has continued to develop, test, and field new nuclear capabilities. Vladimir Putin has openly threatened the use of nuclear weapons during his immoral and unlawful war in Ukraine. China is substantially expanding both its silo fields and its industrial capacity to produce nuclear weapons. North Korea has been testing short- and long-range missiles capable of carrying nuclear weapons. And following the Trump administration's withdrawal from the JCPOA, Iran—as predicted—is now closer to having a nuclear weapon than ever in history.

In its National Defense Strategy and Nuclear Posture Review, the Biden administration has reaffirmed the critical importance of the nuclear triad, and that maintaining a safe, secure, and effective nuclear deterrent remains the top priority of the Department of Defense. This commitment is clear in the strong FY23 budget request for DoD, which fully funds the Sentinel ICBM, B-21 bomber, Long Range Standoff weapon, Columbia-class submarine, and Trident D5 missile to meet planned fielding dates. It is equally apparent in the strong request for the National Nuclear Security Administration—\$21.4 billion, an increase of more than \$750 million from the FY22 enacted level, including \$16.5 billion for weapons activities.

In reading through the testimonies of our witnesses, we are reminded of the immense amount of work that both the Department of Defense and the Department of Energy have ahead of them in sustaining our legacy forces and infrastructure, while also recapitalizing the nuclear enterprise for the next seventy years. The fact that so many just-in-time transitions from legacy-to-modern are happening simultaneously, with a small, specialized workforce, raises concern about the ability of DoD and NNSA to deliver these programs on-time and on-budget. I look

forward to hearing from our witnesses about what steps both departments have taken to improve risk management and prioritization across the nuclear portfolio.

As we look at the immense undertaking that is before both DoD and NNSA to successfully deliver modernized capabilities for the ground-, air-, and sea-legs of the triad, we need to be focused and realistic. In that regard, I commend the Biden administration for its decision to retire the B-83 gravity bomb and forgo a new nuclear sea-launched cruise missile. Adding a life-extension for the B-83 and the development of a new SLCM warhead would further strain an NNSA complex that is already facing significant challenges. Tasking Virginia-class submarines to take on a nuclear mission would be extremely costly and burdensome—we need those platforms fully focused on their critical conventional missions.

Another area where we need to impart realism is plutonium pit production. There is broad agreement that we need to develop the ability to sustainably produce at least 80 new nuclear warheads per year to replace our current stockpile. But both NNSA and the Nuclear Weapons Council have acknowledged that the current statutory requirement to produce 80 plutonium pits per year by 2030 is unachievable—and throwing more money at Savannah River cannot change that outcome. Rather than harbor an illusion, it's time we rethink our plutonium plan, set achievable goals, and go execute.

As I have said countless times, this subcommittee's work is arguably the most meaningful and consequential of any in Congress. Our nuclear deterrent has been the bedrock of our safety and security for the past seven decades, and we must remain steadfast in ensuring that is the case going well into the future.

I request the witnesses keep their opening remarks to no more than five minutes, and that members respect the same limit for their questioning.

I now turn to my Ranking Member, Mr. Lamborn, for any opening remarks he may have.

**Statement of Hon. Doug Lamborn
Ranking Member, Subcommittee on Strategic Forces
Hearing on
Fiscal Year 2023 Budget for Nuclear Forces and
Atomic Energy Defense Activities
May 17, 2022**

Mr. Chairman, thank you for calling today's hearing. Thank you also to our witnesses for joining us today.

When I was appointed the Ranking Member of the Strategic Forces Subcommittee, I assumed that hearings on nuclear triad modernization were going to be the more contentious events of the year. However, I have been pleasantly surprised by the largely bipartisan nature of these issues, and the general consensus that has emerged in this subcommittee on the way forward.

Of course, some of the credit for the unity in this subcommittee can be attributed to the actions of Vladimir Putin and Xi Jinping. But most of the credit goes to the rigor and dedication demonstrated by members of this subcommittee. We'll still have our debates on specific items including SLCM-N and the B83 gravity bomb, but it is refreshing that we can spend most of our time on rigorous oversight and fixing problems together.

Nuclear triad modernization remains the number one priority in the national defense budget and we need to keep it on track. Unfortunately, we are in a situation in which there is no margin for error or delay in any of our nuclear modernization programs. We must urgently work together to ensure our nuclear deterrent remains credible now and in the future.

Our actions across the globe are underpinned by a reliable nuclear deterrent. This is essential when considering China's nuclear breakout, North Korea's continued nuclear testing, Iran's nuclear ambitions, and of course, Russia's invasion of Ukraine and complete nuclear recapitalization.

Without a robust and modern nuclear deterrent, the United States would be hamstrung in our ability to act in our interests and take actions such as providing needed lethal aid to Ukraine. Our nuclear deterrent and common article five are what keeps Putin from striking resupply lines in NATO countries as we stand with Ukraine.

To our witnesses gathered here today, there are some priority areas that I hope we focus our conversations during this fiscal year budget process.

Administrator Hruby, I am interested to know what actions NNSA is taking to fix the longstanding recruitment and retention problems we're having at the national laboratories. If NNSA needs legislative fixes, now is the time to make that request.

General Dawkins, I am interested in your assessment regarding the rigor with which the Air Force is preparing for Sentinel to come online. Swapping one

Sentinel for one Minuteman III on the projected schedule will be very complicated and the planning needs to be taking place now.

Admiral Wolfe, I would like an update on how the D5LE2 program is progressing and if there is any risk in this year's budget request.

Finally, Secretary Plumb, I feel that I learned more from your opening statement about this Administration's view on the nuclear security landscape than I did from the three-paragraph press release on the Nuclear Posture Review. While I appreciated the opportunity to review the classified NPR, it seems high time that the American people, our allies and partners, and our competitors have more insight into America's nuclear deterrence posture. I hope that the unclassified NPR is released soon.

I again thank our witnesses and look forward to their testimony.

**Testimony Statement of
The Honorable Jill Hruby
Under Secretary for Nuclear Security
And Administrator of the
National Nuclear Security Administration
U.S. Department of Energy
Before the
House Armed Services
Subcommittee on Strategic Forces**

May 17, 2022

Chairman Cooper, Ranking Member Lamborn, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year (FY) 2023 budget for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA greatly appreciates the Committee's bipartisan support for our nuclear security mission and for the talented and dedicated workforce responsible for carrying it out every day.

The Department meets its enduring national security mission by maintaining and modernizing the nuclear weapons stockpile so that it is always safe, secure, reliable, and effective; by reducing global nuclear threats; and by providing the U.S. Navy's nuclear-powered submarines and aircraft carriers with militarily effective propulsion systems. NNSA remains uniquely qualified to fulfill these tasks on behalf of the American people and in support of our allies and partners.

The NNSA FY 2023 budget request is informed by the 2022 Nuclear Posture Review and reflects today's increasingly complex geopolitical environment. Importantly, the budget request provides full support for the significant nuclear weapons design and production required to modernize all three legs of the nuclear triad. Once complete, this effort will provide the U.S. with a safer, more secure, and more reliable stockpile that, together with the Department of Defense (DoD) modernization programs, will provide the U.S. with a modern nuclear deterrent capable of responding to a wider array of challenges. The FY 2023 budget request also includes continued funding for the NNSA infrastructure revitalization program needed to produce the weapons and materials for the planned program of record and create an enterprise that is more resilient and flexible. Funding for research, technology, and engineering needed for stockpile certification and innovation activities is maintained in the request.

At the same time, the FY 2023 budget request recognizes we must press ahead with our nuclear nonproliferation and nuclear counterterrorism and counterproliferation efforts as a complementary approach to respond to geopolitical realities. These programs continue efforts to implement and support robust security and safeguards for nuclear materials; shift commercial, research, and medical industries away from highly radioactive materials and technologies; and develop technologies for early detection of proliferation activity. This request recognizes the increased efforts required as nuclear power expands around the world in response to climate

change, and as Russia, China, and North Korea continue to diversify and expand their nuclear arsenals.

The NNSA budget request provides the support needed for Naval Reactors to continue work designing, producing, operating, and maintaining the nuclear propulsion plants for U.S. nuclear submarines and aircraft carriers. The request also fully supports three critical initiatives: the COLUMBIA-class ballistic missile submarine reactor systems development; construction of the Naval Spent Fuel Handling Facility; and the refueling and overhaul of the land-based reactor for continued training and technology testing.

In today's multipolar and more aggressive geopolitical environment, it is imperative that NNSA is both responsive to needs and acts responsibly to avoid escalation or arms racing while preparing for an uncertain future. Our budget request reflects this balance, and our work has never been more critical to global stability.

NNSA's Accomplishments in 2021

Last year, NNSA achieved several key milestones across the nuclear security enterprise despite the unprecedented circumstances COVID-19 presented.

Life Extension and Weapons Modernization Programs: In 2021, NNSA completed first production units (FPU) for the W88 Alteration (Alt) 370 and the B61-12 Life Extension programs. Both refurbished weapons have increased safety and reliability.

Large Line-Item Construction:

NNSA has three large line-item construction projects for nuclear materials underway: two projects associated with plutonium pit production – one at Los Alamos National Laboratory and one at the Savannah River Site – and one project associated with uranium processing at the Y-12 National Security Complex.

The Los Alamos Plutonium Pit Production Project (LAP4) received Critical Decision (CD)-1 approval in April 2021. The Savannah River Plutonium Processing Facility (SRPPF) received CD-1 approval in June 2021. CD-1 approval marks completion of a project's definition phase and the conceptual design as part of DOE's Order 413.3B process for the acquisition of capital assets. Clearing the CD-1 process allows NNSA to establish 90 percent design and associated cost estimation during the subsequent CD-2 effort.

The Uranium Processing Facility (UPF), consisting of seven subprojects, has completed three projects on schedule and under budget and the final four are underway. During 2021, significant construction activity continued and led to the successful full enclosure of all buildings in April 2022, setting the stage for equipment installation.

National Ignition Facility (NIF): In August, the National Ignition Facility at Lawrence Livermore National Laboratory achieved a breakthrough with an experiment that yielded more than 1.3 megajoules of energy and resulted in a burning plasma state for the first time in any

fusion research facility. Burning plasma research is needed for high fidelity modeling of nuclear weapons and is one of the milestones needed to achieve self-sustaining energy production.

Secure Transportation: The Office of Secure Transportation accomplished 100 percent of its assigned missions safely and securely with no mission degradation despite operational challenges present from COVID-19.

Infrastructure Innovation: NNSA purchased the LeMond Carbon Facility in Oak Ridge, TN to replace facilities at Y-12 built in the 1940s used for process development. Use of NNSA's purchase authority for acquisitions allows us to accelerate delivery of modern facilities without the need for new construction.

To support our climate goals, NNSA placed lease orders with the General Services Administration to replace gas-powered cars with approximately 50 zero-emissions vehicles, nearly doubling the size of electric-powered cars in NNSA's fleet.

Nuclear Material Disposal and Reduction: NNSA converted an additional 91 kilograms of plutonium to an oxide form, for a cumulative total of 1,187 kilograms, in preparation for final disposition, continued downblending excess plutonium, and completed construction of a characterization and storage pad for the first shipment of downblended plutonium from the Savannah River Site to the Waste Isolation Pilot Plant. Additionally, the Secretaries of Energy and Health and Humans Services jointly certified that global supplies of molybdenum-99 (Mo-99) produced without the use of highly enriched uranium (HEU) can meet the needs of patients in the U.S. This critical milestone in nonproliferation efforts also triggered a congressionally mandated ban on exports of HEU for foreign medical isotope production.

Global Material Security: NNSA conducted over 75 cyber engagements with international partners to enhance security of nuclear facilities and materials. Partnerships were also started with several domestic advanced reactor vendors for 'security-by-design' activities to enhance the security of the systems for both domestic and international use. NNSA replaced 50 devices (39 domestically and 11 internationally) that use high-activity radioactive sources with non-radioisotopic alternative technologies and secured 48 buildings (28 domestically and 20 internationally) with high priority radioactive sources. In addition, since the start of 2021, NNSA has signed new counter radioactive material smuggling arrangements with Estonia's Ministry of Interior, Ukraine's Ministry of Internal Affairs, Ukraine's State Security Service, Mexico's National Commission for Nuclear Security and Safeguards, Niger's High Atomic Energy Authority, and Morocco's Gendarmerie.

Counterterrorism: NNSA's Nuclear Emergency Support Team (NEST) conducted dozens of operations, including preventative radiological/nuclear detection support to the Presidential Inauguration, Presidential Address to a Joint Session of Congress, New Year's Eve celebrations in Las Vegas and New York City, Super Bowl LV, the Fourth of July celebration on the National Mall, and the 76th Session of the United Nations General Assembly. Additionally, NNSA conducted 50 virtual workshops with U.S. public information officers, law enforcement, first responders, and technical experts concerning radiological counterterrorism to build capacity and improve crisis and risk communication.

Workforce Development: NNSA achieved its highest federal workforce level since 2013 with a total of 1,825 federal employees onboard. To help develop the next-generation workforce, NNSA awarded 13 Minority Serving Institution Partnership Program grants for a total of 24 consortia grants to reach tens of thousands of students in STEM disciplines.

NNSA's FY 2023 Budget Request

The President's FY 2023 budget request for NNSA is \$21.4 billion, an increase of \$1.0 billion, or 5.1 percent, over the FY 2022 enacted level. Funding levels do not reflect the mandated transfer of \$92.75 million in FY 2022 to the Office of Nuclear Energy for operation of the Advanced Test Reactor. This funding request reflects the expanded mission in NNSA and the need for accelerated delivery of the modernization and infrastructure programs. The three NNSA missions – the nuclear deterrent, nuclear security and nonproliferation, and naval nuclear propulsion – have key deliverables in FY 2023. In addition, the capabilities to position NNSA to be successful in the future must be nurtured. We are grateful for the sustained, bipartisan commitment by Congress and multiple administrations and ask for continued support.

Weapons Activities Appropriation

The FY 2023 budget request for the *Weapons Activities* account is \$16.5 billion, an increase of \$566 million, or 3.7 percent over the FY 2022 enacted levels. The request will be supplemented with prior year balances of \$396 million. This budget request represents the Administration's continued strong commitment to a safe, secure, reliable, and effective nuclear deterrent backed by resilient, flexible infrastructure along with cutting edge science, cyber security, and physical protection.

NNSA is fully aware that delivering the deterrent and capabilities our nation needs to respond to the current environment requires a faster pace and a more complete modernization of weapons than over the last several decades. That is why we are re-establishing production capabilities lost in the 1990s and overhauling both our physical infrastructure and human capital to retain technical advantages and build resilience into our enterprise. NNSA is looking forward to overcoming obstacles and building on the successes of the previous year.

The FY 2023 request reflects the need to advance the weapons modernization programs and production capacity at an accelerated pace. The Weapons Activities account includes:

- **Stockpile Management:** Maintenance and modernization of nuclear weapons and production operations to sustain confidence in the safety, security, reliability, and military effectiveness of the stockpile without resuming nuclear explosive testing and associated activities.
- **Production and Infrastructure Modernization:** Investment in NNSA's infrastructure to rebuild capabilities lost in the 1990s and revitalize and expand the capacity of other elements to support stockpile modernization and science. These projects range from significant line-item construction for Plutonium and Uranium related activities to minor construction of offices and light labs to operational infrastructure such as electrical and networking utilities.

- Stockpile Research, Technology, and Engineering: Continued development of state-of-the-art scientific, engineering, and manufacturing capabilities to enable continuous improvement in design, certification, and production of the enduring nuclear weapons stockpile and to stay ahead of the threat.
- Transportation, Nuclear, and Cyber Security: Keeping pace with evolving threats and sustaining transportation, cyber and physical security across the nuclear security enterprise to improve resilience.

NNSA restructured the Weapons Activities budget in FY 2021 to enable better alignment of portfolios with resources. This allowed improved prioritization within portfolios that have multiple programs and interdependencies. Further refinements are proposed in FY 2023 to align programmatic construction with the portfolio each project supports. Comparisons throughout the Weapons Activities portfolio assume this alignment in the FY 2022 enacted levels as well.

Stockpile Management

The FY23 Stockpile Management budget request is \$4.9 billion, an increase of \$291 million, or 6.3 percent, over the FY 2022 enacted level. This portfolio covers the maintenance of a safe, secure, reliable, and militarily effective nuclear weapons stockpile. Activities include life extension programs (LEP) and other weapons modernization activities; surveillance, minor alterations, and limited life component exchanges; providing the safe dismantlement of nuclear weapons and components; and providing sustainment of needed manufacturing capabilities and capacities. The FY 2023 request also includes funding for Nuclear Enterprise Assurance (NEA) to prevent, detect, and mitigate subversion risks to the nuclear weapons stockpile and associated design, production, and testing capabilities.

W88 Alteration (Alt) 370: NNSA expects the W88 Alt 370 program to enter Phase 6.6, *Full-Scale Production*, in July 2022. Production is currently on schedule to meet DoD deployment schedules.

B61-12 LEP: NNSA expects the B61-12 LEP to enter Phase 6.6, *Full-Scale Production*, in June 2022. The B61-12 LEP consolidates multiple variants of the B61 gravity bomb and improves the safety and security of the weapon. Production is currently on schedule to meet DoD deployment schedules.

W80-4 LEP: NNSA is continuing Phase 6.3 activities, *Development Engineering*, and plans to enter Phase 6.4, *Production Engineering*, in FY 2023. The W80-4 FPU date is currently being re-evaluated due to COVID-19 impacts, slower than planned hiring and increased attrition, and component technical challenges. The updated FPU schedule will be developed by mid-2022. NNSA's revised schedule is expected to support the U.S. Air Force's (USAF) schedule for Long Range Standoff missile initial operating capability.

W87-1 Modification Program: The W87-1 will replace the aging W78 warhead using a modification of the existing W87-0 design. The W87-1 will deploy new technologies that improve safety and security, address obsolete designs and materials, and simplify warhead manufacturability. The FY 2023 budget request supports NNSA's commitment for a planned

FPU in FY 2030 to meet DoD's scheduled deployment of the Sentinel missile. The request supports Phase 6.3, *Development Engineering*, activities including joint testing with USAF Sentinel missile and Mk21A reentry vehicle program and conducting the Conceptual Design Review. NNSA plans to enter Phase 6.3 in FY 2022.

W93/Mk7: In February 2022, the NWC voted to authorize the W93's entry into Phase 2, *Feasibility Study and Design Options*. NNSA's FY 2023 funding request will support the Phase 2 activities including further examination of design concepts from Phase 1, and down-selection to desired weapon design(s) to be subsequently developed in Phase 2A, *Design Definition and Cost Study*, planned for FY 2026. All the W93's key nuclear components will be based on currently deployed and previously tested nuclear designs, as well as extensive stockpile component and materials experience. It will not require additional nuclear explosive testing to certify. The W93 is vital for continuing our longstanding cooperation with the UK, which is modernizing its nuclear forces. The U.S.'s W93 program is a separate but parallel program critical to the UK's replacement warhead (RW) for its submarine launched ballistic missile. As an allied but independent nuclear power that contributes to NATO's nuclear deterrent posture, the UK's nuclear deterrent is critical to U.S. national security.

Within Stockpile Management, the FY 2023 budget request includes \$1.3 billion for *Stockpile Sustainment*, an increase of \$141 million, or 11.9 percent above the FY 2022 enacted level. This program is responsible for producing and replacing limited-life components such as neutron generators and gas transfer systems; conducting maintenance, surveillance, and evaluations to assess weapon reliability and detect any potential concerns; and analyzing information compiled during the annual assessment process.

The request for Stockpile Management also includes \$631 million for *Production Operations*, an increase of \$62 million, or 10.9 percent, above the FY 2022 enacted level. Included in this request is funding to support continued growth of base capabilities, both in staffing and equipment, required to support increased LEP workload as certain programs reach full-scale production rates.

Production Modernization

The FY 2023 Production Modernization budget request is \$4.64 billion, an increase of \$484 million, or 11.6 percent, over the FY 2022 enacted level. This funding focuses on production capabilities for nuclear weapons components including primaries, canned subassemblies, radiation cases and non-nuclear components needed to sustain the nuclear weapons stockpile near-to long-term.

Primary Capability Modernization: NNSA's most intensive recapitalization effort is reconstitution of plutonium pit production fabrication capabilities. NNSA is required to produce no fewer than 80 pits per year (ppy) during 2030. NNSA has outlined a two-site approach for producing 80 ppy utilizing Los Alamos National Laboratory (LANL) to produce 30 ppy and the Savannah River Site (SRS) to produce 50 ppy. The two-site approach will provide the required capacity while enhancing resiliency and flexibility. At this time, the production of 30 ppy at LANL during 2026 remains on schedule with some technical challenges remaining. However,

the production of 50 ppy at SRS during 2030 is not achievable. The Secretary of Energy and the Nuclear Weapons Council have both notified Congress regarding the inability to produce 80 ppy in 2030. However, NNSA remains committed to achieving 80 ppy as close to 2030 as possible. The FY 2023 budget request funds pit production and associated efforts with a 26 percent increase compared to FY 2022. NNSA continues to work with DoD to develop a plan to maintain the required stockpile until pit production capabilities are fully established.

The FY 2023 request for LANL Plutonium Modernization will support equipment installation, continue decontamination and demolition work, and mature project design for the LAP4. This includes adding equipment in Plutonium Facility 4 (PF-4) to support 30 ppy in 2026, construction of a training facility to support workforce development, and construction of a higher capacity entrance control facility.

The FY 2023 funds for SRPPF will be used to continue the CD-2 work to establish a 90 percent design. CD-2 is forecast for completion in early FY 2024. Additionally, the request supports early site preparation including removal of unnecessary walls and building systems originally installed for the Mixed Oxide Fuel Fabrication Facility.

Secondary Capability Modernization: NNSA is also modernizing its uranium, lithium, and tritium processing efforts necessary to fabricate nuclear weapon secondaries. NNSA's uranium strategy aims to relocate enriched uranium processing capabilities into the UPF and other enduring facilities to reduce mission dependency on Building 9212, which is over 75 years old. This will be accomplished by completing construction of UPF to provide new floor space for high hazard operations; extending the operational lifetime of buildings 9215, 9204-2E, and 9995 into the 2040s; introducing new processes to increase safety and efficiency in the new facilities; and supplying the current stockpile with purified enriched uranium metal.

UPF will provide for the long-term viability, safety, and security of enriched uranium processing capability in the United States while significantly improving worker and public safety. The construction is well underway with a peak production workforce of 3,000 people in FYs 2022 and 2023. Ongoing supply chain issues and delays associated with the COVID-19 pandemic are projected to result in a delay of about 8 months beyond the scheduled completion date of December 2025. A comprehensive annual cost update is being conducted for the UPF project completion to better understand factors that could potentially affect total costs. Overall, UPF is 70 percent complete with the first three non-nuclear infrastructure subprojects completed under budget and on schedule.

Additionally, in FY 2021, NNSA initiated the Depleted Uranium (DU) Modernization Program to meet growing mission requirements. This effort will reconstitute lapsed DU alloying and component manufacturing capabilities at Y-12; invest in key new technologies to improve efficiency and reduce lifecycle costs; and increase the reliability and capacity. The DU Modernization Program request for FY 2023 is \$170 million.

The U.S. no longer maintains a full lithium purification capability and relies on direct recycling as the main source of lithium for nuclear weapons systems. NNSA's Lithium Strategy will increase the supply of lithium by recycling components from dismantled systems, sustain and

recapitalize existing infrastructure through a transition period, and design and construct a Lithium Processing Facility (LPF) to house processing capabilities by 2031. LPF will replace capabilities performed in Y-12's buildings 9204-2 and 9202 and will include recovery, purification, and component fabrication operations. While current capabilities can provide a sufficient lithium supply through 2035, operations take place in an aging facility with significant infrastructure challenges. LPF will alleviate those issues and reduce risk while providing capacity to meet material demands beyond 2035.

The FY 2023 budget request for the Tritium and Domestic Uranium Enrichment is \$580 million, an increase of \$64 million, or 12.4 percent above the FY 2022 enacted level. For Domestic Uranium Enrichment the FY 2023 budget request supports HEU down-blending to extend the need date for low-enriched uranium (LEU) for tritium production to 2044, enrichment technology development, and acquisition activities to meet future enriched uranium needs. HEU downblending began in FY 2019 and will continue through FY 2025. NNSA is currently conducting an analysis of alternatives, which is expected to conclude in the mid-2020s that will inform a final down-select of an enrichment options. Other NNSA programs such as reactor fuel and naval propulsion fuel are also supported by this effort.

The Tritium Modernization Program's mission is to establish and operate a domestic source of tritium to meet national security requirements, which includes recycling tritium gas to maintain required inventories and sustaining reliable supply chain infrastructure and equipment. Since 2003, NNSA's tritium production has met all production, delivery, and schedule requirements. Because NNSA is currently ramping up production levels at the Tennessee Valley Authority to meet future delivery requirements, the requested budget has been increased. NNSA is also in the early phases of constructing the Tritium Finishing Facility (TFF), which will replace a 1950s-era facility. TFF will house the finishing, packing, and shipping of gas reservoirs to meet mission requirements. This major infrastructure modernization initiative will fulfill a critical mission need and enable the program to meet contemporary safety standards. The facility will house functions to receive, inspect, finish, package, and ship reservoirs. Construction of the site preparation subproject is scheduled to start in FY 2024.

Non-Nuclear Component Modernization: Non-nuclear components (NNCs) include a wide array of parts that weaponize the nuclear explosive package. Examples are gas transfer systems, neutron generators, microelectronics, and power sources. NNCs make up more than half the cost of weapon modernization due to the number, complexity, and their qualification in extreme environments over the warhead lifecycle. Therefore, delivering NNCs requires an extensive foundation of capabilities for the design, development, qualification, production, and surveillance of these components. The FY 2023 request includes funding to provide equipment for increased manufacturing capacity at the Kansas City National Security Campus; reconstitute thermal spray capability for weapon modernization; recapitalize radiation and major environmental test facilities at Sandia National Laboratories used to design and qualify NNCs; and tools and equipment at the Microsystems Engineering, Science and Applications (MESA) Complex at Sandia, which serves as the only approved source of trusted, strategically radiation hardened microelectronics.

Infrastructure and Operations

NNSA has been taking significant steps to modernize and recapitalize its infrastructure to meet expanding demands, reduce mission and safety risk, and draw down its deferred maintenance backlog. A well-organized, well-maintained, and modern infrastructure system is the bedrock of a flexible and resilient nuclear enterprise. Almost 60 percent of NNSA facilities were beyond their 40-year life expectancy at the end of FY 2021 with some dating back to the Manhattan Project. Our modernization and recapitalization efforts will provide for the safety of our workforce, the communities around our facilities, and our environment. NNSA can address this challenge only with sustained, predictable, and timely funding.

The FY 2023 budget request for Infrastructure and Operations is \$2.63 billion, an increase of \$144 million or 5.8 percent over the FY 2022 enacted amount. This increase will enable NNSA to build on the Infrastructure Modernization Initiative, including adopting new practices that will streamline construction practices to save time and money on low-risk, non-nuclear, construction projects.

Deferred maintenance has been a key focus of both NNSA and Congress. At the end of FY 2021, NNSA had \$6.1 billion of deferred maintenance and an enterprise-wide replacement plant value of \$121.5 billion. While this ratio may seem high, construction of new facilities and associated demolition of legacy facilities will have a substantial role in reducing NNSA infrastructure challenges. Approximately 90 percent of NNSA deferred maintenance is associated with facilities that are approaching or have surpassed their intended design life. NNSA is integrating its infrastructure modernization work with the Department's Office of Environmental Management supported effort to demolish high-risk excess facilities at the Y-12 National Security Complex, Lawrence Livermore National Lab, and Los Alamos National Lab. NNSA is using this intentional approach to prioritize investments based on mission risk while underscoring the need for sustained commitment to move beyond legacy infrastructure. The FY 2023 budget request includes increases in *Mission Enabling Construction* accounts so that NNSA can address mission needs, achieve operational efficiencies, and reduce risks to safety, security, the environment, and program.

For years, NNSA has used a prioritization methodology for recapitalization investments that factors in sustainability and resilience along with safety and mission risk. In FY 2023, NNSA is increasing its emphasis on climate resiliency projects through the Energy Resilient Infrastructure and Climate Adaptation (ERICA) initiative. ERICA is part of NNSA's multifaceted approach to address climate adaptation and resilience using direct- and indirect-funded infrastructure programs and alternative financing. For example, the planned Building 848 Net Zero Energy Upgrade project at Sandia will move the facility to being 100 percent powered by on-site generated electricity while also improving its operations, indoor air quality, and thermal comfort.

NNSA uses data-driven, risk informed tools and initiatives to improve decision making, accelerate the delivery, and reduce the cost of commercial-like construction projects. For example, in FY 2019 NNSA established the Enhanced Minor Construction & Commercial Standards (EMC²) pilot, which is challenging the paradigm for how NNSA executes low-risk, non-complex construction projects to accelerate delivery and reduce costs. There are 10 projects

in the pilot, including the Lawrence Livermore National Laboratory's Emergency Operations Center (EOC) which is the first pilot project to be completed earlier this year. Using the EMC² approach, the Livermore EOC was completed 13 months after receiving full construction funding in January 2021. In the first four pilot projects currently underway, estimated cost savings range from approximately 12 to 31 percent. An additional six EMC² projects are projected to result in estimated cost savings of 17 to 38 percent.

Stockpile Research, Technology and Engineering

For Stockpile Research, Technology, and Engineering, the FY 2023 budget request is \$2.89 billion, a decrease of \$83 million, or 2.8 percent below the FY 2022 enacted level. The decrease results from the use of carryover balances to continue construction of the U1a Complex Enhancement Project at the Nevada National Security Site (NNSS). After adjusting for this reduction, the Stockpile Research, Technology, and Engineering request is stable from FY 2022 enacted.

This portfolio provides the scientific foundation for science-based stockpile activities, including the capabilities, tools, and components needed to assess the active stockpile and to certify warhead modernization programs without the need for underground nuclear testing. NNSA's unparalleled science and technical capabilities, and commitment to their constant improvement, helps cultivate the knowledge and expertise to maintain confidence in the stockpile. The major activities in the Stockpile Research, Technology, and Engineering portfolio are:

Enhanced Capabilities for Subcritical Experiments (ECSE): ECSE will produce experimental data in underground tunnels at the NNSS that will enable high fidelity assessment of the current stockpile and certification of the future stockpile without the need to return to underground nuclear-explosive testing. ECSE experiments are designed to remain subcritical throughout the experiment to adhere to the U.S. policy of "zero yield."

Stockpile Responsiveness Program (SRP): SRP is responsible for exercising and enhancing capabilities across the entire nuclear weapons development and production process to improve the responsiveness of the United States to future threats, technology trends, and international developments not addressed by existing life extension programs. For example, SRP is investing in efforts to address issues in design for manufacturability, digital engineering, component, and system prototyping and testing.

Inertial Confinement Fusion (ICF) Program: The ICF Program supports the assessment and certification of the nuclear weapon stockpile by providing the facilities, scientific expertise, and experimental capability necessary to acquire data at the extreme conditions of nuclear weapon operation. The ICF program also supports research on thermonuclear fusion with the goal of reaching fusion ignition and eventually high fusion yield in the laboratory. The FY 2023 request supports ICF research and facilities, enabling access to experimental data that underpin the safety, security, and effectiveness of the nuclear stockpile and continued progress toward the capabilities necessary to meet long-term stewardship needs.

NNSA Exascale Computing Initiative: The Exascale Computing Initiative (ECI) will provide NNSA with next-generation simulation capabilities to support weapons design, science-based stockpile stewardship, and stockpile certification activities. The FY 2023 budget request will continue funding maturation of next-generation simulation and computing technologies and enables NNSA to meet its exascale system initial operation capability in FY 2023, including transition of the next-generation, validated weapons codes to next-generation classified computing.

Academic Programs: The challenges of sustaining the nuclear deterrent long-term demand a strong and diverse base of national expertise and educational opportunities in specialized technical areas that uniquely contribute to stockpile stewardship. NNSA's Academic Programs are designed to cultivate, attract, and retain such a workforce. Funding in this area supports the Administration's Executive Order on Advancing Racial Equity and Support for Underserved Communities through the federal government, Academic Alliances and existing partnerships with Minority Serving Institutions, and an increase in student engagement and internship opportunities.

Secure Transportation Asset

Secure Transportation Asset (STA) supports the safe, secure transport of the Nation's nuclear weapons, weapon components, and special nuclear material throughout the nuclear security enterprise to meet nuclear security requirements. Nuclear weapon life extension programs, limited-life component exchanges, surveillance, dismantlement, nonproliferation activities, and experimental programs rely on STA to ensure safe, secure, and on-schedule transport. The FY 2023 budget request for STA is \$344 million, an increase of \$13.7 million, or 4.1 percent, above the FY 2022 enacted amount to increase the Federal Agent workforce to a level necessary to keep pace with the growing program deliverables.

The Office of Secure Transportation's (OST) priorities for FY 2023 include modernization and sustainment of transportation assets. This includes the Safeguards Transporter (SGT) life extension program to secure its service until replacement by the Mobile Guardian Transporter (MGT), as well as the entry into service of procured 737-700 aircraft. The first MGT Production Unit is planned for completion in FY 2026 and initial rate production is set to commence in FY 2027. Currently, aircraft are undergoing heavy maintenance checks, painting to NNSA standards, and a major modification from a passenger jet to a FlexCombi that is configurable to carry various loads of personnel and cargo.

OST also remains focused on recruiting, stabilizing, training, and retaining the Federal Agent and staff workforce necessary to support mission requirements. OST has committed to a stable human resources strategy to achieve an optimal agent force. OST has increased staffing numbers by optimizing position qualifications and managing risk associated with the Human Reliability Program. Although COVID-19 impacted key milestones and deliverables, OST successfully accomplished every assigned mission for the previous year.

Defense Nuclear Security

Defense Nuclear Security's FY 2023 budget request is \$882.3 million, an increase of \$38.2 million, or 4.5 percent over the FY 2022 enacted level. The Office of Defense Nuclear Security's (DNS) primary mission is protecting the facilities, people, and assets critical to achieving NNSA's important national security missions. The need for increasing security due to growth across enterprise from projects such as LAP4 and UPF, along with additional resources required to sustain core security, has resulted in increased program requirements for DNS. Support for the request is vital for the protection of the enterprise, its people, and its sensitive material and information. DNS remains focused on improving physical security infrastructure with several new projects and the development and deployment of new systems. Progress is also being made in countering unmanned aircraft systems. The first such platform was deployed at LANL in December 2017. Deployment at other facilities is expected to be completed in late FY 2022.

Cybersecurity and Emerging Issues

The FY 2023 budget request for information technology and cybersecurity is \$445.7 million, \$39.1 million, or 9.6 percent, over the FY 2022 enacted amount. This request funds ongoing operations and invests in improvements across NNSA to modernize both classified and unclassified systems, improves information management and data governance, implements critical aspects of a zero-trust architecture in our networks and systems, and allows for the execution of a robust cybersecurity program. As an example, NNSA recently recapitalized its deployed cyber sensor platform, significantly improving the ability to detect and respond to malicious activity.

Maintaining a strong cybersecurity program is a critical defense mechanism and a powerful deterrence tool. To strengthen oversight of the cyber program, the budget request includes a recategorization of certain Cybersecurity program investments into the Information Technology program. As a result, the request more clearly reflects investments in cybersecurity tools and services provided to the enterprise, maintains core cyber operations at the labs, plants, and sites, and improves management and transparency of these funds.

NNSA also recently completed an enterprise-wide cybersecurity assessment, in conjunction with the Institute for Defense Analyses, aimed at evaluating the overall cybersecurity posture and developing a set of recommendations to improve the program. That review calls for increased investment in information technology and cyber infrastructure to better meet current and emerging challenges, as well as outlines strategies related to workforce development issues. NNSA has already started acting on the findings and will continue to do so with the FY 2023 requested budget.

Defense Nuclear Nonproliferation Appropriation

The FY 2023 budget request for the Defense Nuclear Nonproliferation account is \$2.3 billion, an increase of \$274 million, or 13.2 percent, over the FY 2022 enacted level. When the use of prior year balances is considered, the proposed funding level for the account increases by \$397 million, or 19.2 percent. The use of prior year balances will allow DNN programs to supplement new budget authority across its programs.

This account funds all activities in the offices of Defense Nuclear Nonproliferation, Emergency Operations, and Counterterrorism and Counterproliferation. Within these offices, this appropriation funds six nonproliferation programs, a counterterrorism and counterproliferation program, and an incident response program as part of a whole-of-government approach. Together these efforts provide policy and technical leadership to prevent or limit the spread of weapons of mass destruction (WMD) and the related materials, technology, and expertise as well as to detect and respond to nuclear terrorism or proliferation events.

Nonproliferation Efforts

For decades, Defense Nuclear Nonproliferation (DNN) has developed and implemented policy and technical solutions to eliminate proliferation sensitive material and limit or prevent the spread of materials, technology, and expertise necessary for nuclear and radiological weapons. By working with governments, international organizations, and private sector partners around the world these efforts reduce the reliance on radioactive material in commercial and research industries; better secure nuclear and radioactive material; develop capabilities to interdict material outside of regulatory control; and maintain a robust response capability for nuclear and radiological incidents at home and abroad.

The FY 2023 budget request will allow the Office of Defense Nuclear Nonproliferation to better confront current and anticipated proliferation challenges including the growing nuclear programs and strategic competition with Russia and China, the impacts of Russia's full-scale invasion of Ukraine, risks related to the North Korean and Iranian nuclear programs, and disruptive technologies that lower the barrier to proliferation. Through these efforts DNN aims to restore American leadership in nonproliferation solutions and cutting-edge technology required to address future threats.

The *Material Management and Minimization (M3)* program FY 2023 budget request is \$451 million, an increase of \$108 million, or 31.5 percent, over the FY 2022 enacted level. M3 programs reduce and, when possible, eliminate weapons-usable nuclear material around the world. The FY 2023 budget request supports the conversion or shutdown of research reactors and isotope production facilities that use HEU, the use of non-HEU-based Mo-99 production, the removal and disposal of weapons-usable nuclear material, and the removal of plutonium from the state of South Carolina. Additionally, to date, nearly 7,270 kilograms of weapons-usable nuclear material from 48 countries and Taiwan have been removed or confirmed disposed, while 108 civilian research reactors and isotope production facilities have stopped using weapons-grade material in their work.

The *Global Material Security* program FY 2023 budget request is \$504 million, a decrease of \$27.4 million, or 5.1 percent, below the FY 2022 enacted level. The FY 2023 request supports program efforts to prevent terrorists and other actors from obtaining nuclear and radioactive material for use in an improvised nuclear device by working with domestic and global partners. This includes improving the security of vulnerable materials and sites, promoting the adoption of alternative technologies that do not rely on radioactive sources, and increasing capacity to detect, disrupt and interdict illicit trafficking operations. Working through the RadSecure 100 Initiative,

NNSA will accelerate and expand permanent risk reduction, security enhancements, and response integration with local law enforcement in the top 100 major metropolitan areas of the United States. To date, NNSA has replaced approximately 130 cesium-137 based blood irradiators with alternative technologies. The program remains on track to replace nearly all the estimated 400 such devices in the United States by 2027 as mandated in the FY 2019 NDAA. In addition, NNSA is partnering with domestic advanced nuclear reactor vendors in 'security-by-design' activities to enhance the security of their systems for domestic and international use. Finally, NNSA continues to build additional partnerships with bilateral and multilateral partners focused on counter nuclear smuggling. To date, NNSA partners with 84 countries in this area and continues to expand cooperation with existing and new partners to expand global counter nuclear smuggling capabilities.

The *Nonproliferation and Arms Control (NPAC)* program FY 2023 budget request is \$208 million, an increase of \$23 million, or 12.4 percent, above the FY 2022 enacted level. The increased funding request supports two increasingly important activities: (1) policy and technology development activities for peaceful uses of nuclear energy along with support for the International Atomic Energy Agency (IAEA), and (2) policy and technology development for potential arms control agreements that extend to new types of strategic weapons as well as tactical nuclear weapons.

By focusing on ensuring the peaceful use of nuclear energy, NPAC programs strengthen nonproliferation regimes through the development and implementation of effective technologies and policies. This is especially important as nuclear energy programs expand internationally in response to clean energy implementation to address climate change. New nuclear safeguards and monitoring and verification technologies are needed to secure materials and to detect proliferation activities early. NPAC works to mature technologies and transfer them to the International Atomic Energy Agency (IAEA) and partner countries to implement. The US also supplies IAEA with U.S. subject matter experts, training, and equipment advice and procurement aid. In FY 2022 and FY 2023 NPAC is helping establish the nonproliferation enrichment testing and training platform. This platform will be turned over to the IAEA for commissioning and operation in FY 2024. On the policy side, NPAC supports the development and implementation of Section 123 agreements and the careful regulation of nuclear technology exports utilizing Part 810 Authorizations.

Approximately \$30 million funds increasing nuclear weapons verification activities. This will improve U.S. technical policy and readiness for future arms control agreements and associated verification technology. New investment in the Arms Control Advancement Initiative will strengthen NNSA's capacity to address future nuclear warhead monitoring and verification requirements through advanced technology development, robust modeling and measurements, and sustained expert engagement to maintain a pipeline of experts to help advance arms control objectives over time.

The *Defense Nuclear Nonproliferation Research and Development (DNN R&D)* program FY 2023 budget request is \$720 million, a decrease of \$9 million, or 1.2 percent, below the FY 2022

enacted level. DNN R&D is the key component for the innovation of United States' technical capabilities to detect nuclear detonations; foreign nuclear weapons programs' activities; and the presence, movement, or diversion of special nuclear materials. The program also sustains and develops foundational nonproliferation technical competencies that ensure the technical agility needed to support a broad spectrum of U.S. nonproliferation missions and anticipate threats. Consistent with the growing nonproliferation challenges, this funding request for DNN R&D programs will expand activities that advance the development of next-generation nuclear arms control monitoring and verification technology and expertise symbiotic with the NPAC efforts.

The *Nonproliferation Construction* program FY 2023 budget request is \$72 million, a decrease of \$84 million, or 54 percent, below the FY 2022 enacted level. This decrease is due to the awarding of the long-lead procurement contracts for gloveboxes, emergency generators and HEPA filters under CD-3A Phase 2 in FY 2022 and the expected FY 2023 completion of design work for the Surplus Plutonium Disposition (SPD) project required for CD-2/3, *Approval of Performance Baseline and Start of Construction*. The FY 2023 budget request supports the implementation of the dilute and dispose strategy, by continuing design for the SPD project. The SPD project will add additional glovebox capacity at the SRS to accelerate plutonium dilution and aid in the removal of plutonium from South Carolina.

NNSA is requesting the establishment of a *Bioassurance Program* in FY 2023. The budget request is \$20 million. As the COVID-19 pandemic has shown, the United States needs better capabilities to anticipate, respond to, and mitigate threats to the bioeconomy. NNSA proposes to establish a national security bioassurance program to perform activities to anticipate and detect threats and scale response solutions to support the security of the future bioeconomy and monitor and thwart malpractice in this area. This funding supports foundational work at DOE/NNSA laboratories including the anticipation of destabilizing threats through modeling, identifying threat signatures and developing detection technologies, and rapidly developing and validating safeguards and threat mitigation approaches. NNSA will integrate its high-security work with the Department's Office of Science supported "open" science work and other government agencies, providing the full spectrum of capabilities essential for a bioassurance program informed by national security expertise drawn from parallel and analogous work on nuclear threats, risks, export controls and licensing, nonproliferation, detection, and verification.

Nuclear Counterterrorism and Incident Response

The FY 2023 request for the *Nuclear Counterterrorism and Incident Response (NCTIR)* program is \$439 million, an increase of \$68 million, or 18.4 percent, over the FY 2022 enacted amount. The NCTIR program supports two subprograms: *Counterterrorism and Counterproliferation (CTCP)* and *Emergency Operations (EO)*.

CTCP is responsible for countering nuclear terrorism and nuclear proliferation, responding to nuclear incidents and accidents worldwide, advancing nuclear forensic capabilities, and building domestic and international partner capacity concerning emergency preparedness and response. CTCP's unique scientific and operational capabilities make it an integral part of the U.S. Government's layered defense against nuclear terrorism and nuclear proliferation.

CTCP manages the NEST, NNSA's multi-mission emergency response capability comprised of on-call technical specialists who are trained and equipped to respond to nuclear incidents and accidents worldwide. NEST's missions include both national security and public health and safety disciplines.

NNSA, in conjunction with the Federal Bureau of Investigation (FBI), supports regional counter-WMD teams in 14 major U.S. cities as part of the "Capability Forward" initiative. CTCP provides technology, equipment, and training in support of these teams to enhance regional capabilities to defeat nuclear and radiological devices, accelerating life-saving responses to a WMD event.

The FY 2023 budget request addresses critical shortfalls in CTCP's capabilities to execute DOE's Primary Mission Essential Function (PMEF)-2, *Respond to Nuclear Incidents*. In coordination with interagency efforts to identify and address WMD response gaps, increased funding addresses staffing needs, ensures operational integration and full-spectrum training and exercises in accordance with interagency objectives, and supports technology development and infrastructure requirements.

Additional programmatic funding will also invest in new incident response expertise and technology; continue NEST equipment recapitalization efforts with planned procurement for replacement of diagnostic equipment and detection systems required for the public health and safety, counter-WMD, and nuclear weapon accident response mission areas; and bolster CTCP efforts to counter nuclear proliferation through applied analysis, concept development, predictive modeling, and testing.

CTCP also contributes to the interagency National Technical Nuclear Forensics mission, a central pillar of the U.S. strategy to deter hostile states from providing nuclear material to terrorists. CTCP's FY 2023 budget request includes \$43 million for this effort, including training and exercises for responders; procurement, maintenance, logistics, and technical integration of equipment; readiness to deploy pre- and post-detonation response and device assessment teams; and laboratory analysis of nuclear or radiological material.

EO provides both the structure and processes to ensure a comprehensive and integrated approach to all-hazards emergency management, thus improving readiness and effectiveness of the DOE Emergency Management System on a programmatic and performance level regardless of the nature of the emergency impacting the DOE/NNSA enterprise or its equities anywhere in the world. The FY 2023 budget request supports Continuity of Operations, Continuity of Government, and Enduring Constitutional Government programs to advance the National Continuity Policy and ensure the continued performance and delivery of essential services under any circumstances. The FY 2023 budget request also provides for 24/7/365 Consolidated Emergency Operations Center communications and coordination support to the DOE/NNSA Emergency Management Enterprise and Departmental Senior Leadership. The request also includes funding for investments in communications equipment and classified communications system improvements to support emergency operations and continuity infrastructure improvements.

Naval Reactors Appropriation

Advancing Naval Nuclear Propulsion

With over 40 percent of the Navy's major combatants being nuclear-powered, this technology remains critical to our national security posture. It provides the nation's submarines and aircraft carriers with unmatched mobility, flexibility, responsiveness, and endurance. The ability to maintain robust fleet capabilities on long-term missions is essential for the security of global trade and the security of our allies. The Office of Naval Reactors is the foundation of this national achievement in global security. Cutting edge advancements across all aspects of the Naval Nuclear Propulsion Program, from reactor plant development and design to the disposition of spent fuel, gives the U.S. Navy a decisive edge in naval warfare and enhances the security and reliability of the sea-leg of our nuclear triad.

The FY 2023 budget request for *Naval Reactors* is \$2.08 billion, an increase of \$163 million, or 8.5 percent, above the FY 2022 enacted level. The funding does not reflect the mandated transfer of \$92.75 million in FY 2022 to the Office of Nuclear Energy for operation of the Advanced Test Reactor. The budget request supports the continued safe and reliable operation of the nuclear-powered fleet, and it supports investment in technology development to deliver improvements in propulsion plant performance, manufacturability, and affordability – for current and future warships. Funding also supports requirements for the office's three major projects: COLUMBIA-class ballistic missile submarine reactor systems development; construction of the Naval Spent Fuel Handling Facility in Idaho; and the refueling and overhaul of the S8G Prototype land-based reactor in New York for continued sailor training and technology testing.

Consistent, sustained funding is vital for the support of these projects and will allow Naval Reactors to meet current and future force needs. Close coordination with the Navy led to the start of construction of the COLUMBIA-class lead ship in FY 2021. The S8G Refueling Overhaul is expected to reach completion in FY 2023. The Spent Fuel Handling Recapitalization project at the Naval Reactors Facility in Idaho is making significant progress with an estimated completion in FY 2026.

AUKUS

On September 15, 2021, Australia, the UK, and the U.S. announced the creation of an enhanced trilateral security partnership (AUKUS), focused on peace and security in the Indo-Pacific region. The three governments are currently six months into an 18-month consultation period to establish the most efficient path forward for the delivery of a nuclear-powered, conventional, submarine capability to Australia as expeditiously as possible. As part of the international working group developing nonproliferation and safeguards aspects of the AUKUS program, NNSA will provide technical advice to the interagency and our AUKUS partners on the full suite of requirements that underpin nuclear stewardship to implement strong safeguards measures and achieve the AUKUS objectives.

This cooperation is fully consistent with our obligations under the Nuclear Nonproliferation Treaty (NPT). The NPT does not prohibit naval nuclear propulsion. In our role in this trilateral

partnership, we intend to implement the strongest possible nonproliferation standards to maintain the strength and integrity of the nuclear nonproliferation regime. Australia is not seeking, and the U.S. and UK are not and will not assist in any acquisition of nuclear weapons. Additionally, Australia has committed not to enrich uranium or reprocess spent fuel in the context of AUKUS.

Federal Salaries and Expenses Appropriation

The FY 2023 budget request for *Federal Salaries and Expenses* (FSE) is \$496 million, an increase of \$32 million, or 7 percent, above the FY 2022 enacted level. The increase in this account will support an additional 132 Federal Full-time Equivalents (FTE) above the FY 2022 enacted level, bringing the total to 1,958. FSE increases will also support increased space and occupancy needs, travel costs, support service contractors, training, and other related expenses.

The NNSA Federal workforce is critical to the success of the Nation's nuclear security enterprise. NNSA's expanding mission requirements and pressing modernization and recapitalization needs require recruiting, training, and retaining a skilled Federal workforce with the appropriate capabilities to meet mission requirements and deliver on our objectives. This workforce represents some of the top minds on nuclear issues, consisting of a diverse team of scientists, engineers, project and program managers, foreign affairs specialists, and support staff that perform program and project management and conduct appropriate oversight of national security missions. NNSA's Federal workforce is distributed across the enterprise and can be found in eight states and Washington, DC.

NNSA currently faces two significant hurdles in achieving full staffing: retirement and private sector competition. As of FY 2021 17.3 percent of NNSA FTE Federal staff are eligible to retire, a number that is expected to rise to 35.4 percent by FY 2027. Additionally, in FY 2021 the annual FSE attrition rate was 10.7 percent, higher than the average attrition rate of 8.9 percent over the past 13 years. NNSA also faces competition from the private sector for top talent in technical fields.

Combating these trends requires an aggressive, external hiring strategy. NNSA has utilized a renewed focus on virtual recruitment events that support hiring across the nuclear security enterprise in support of all program areas. In October 2021, NNSA initiated a pilot program for expedited hiring within 15 business days, from the time the program office selected a candidate to the time Human Resources provided an entry on duty date. NNSA is applying lessons learned from this pilot program to continue progress on a streamlined hiring effort. Finally, NNSA has expanded the effort to enlarge fellowship program candidate pools and employ available alternative hiring authorities to compress the hiring timeline for qualified candidates and increase the overall hiring rate.

NNSA's recruitment and hiring efforts will support mission and growth requirements and will continue to support the Administration's goals of promoting racial and economic equity as a way to foster scientific breakthroughs, research and development excellence, and enhanced national security.

Conclusion

NNSA's enduring responsibility is providing the United States with a nuclear weapons stockpile and naval nuclear propulsion systems that are the best in the world while simultaneously promoting nonproliferation and counterterrorism efforts to reduce overall nuclear risk. The President's FY 2023 budget, informed by the 2022 Nuclear Posture Review, supports our efforts to keep the nuclear deterrent and naval nuclear propulsion systems safe, secure, reliable, and militarily effective. Recognizing the increasingly volatile geopolitical environment, NNSA must also stay resolute in sustaining and evolving our nuclear security, non-proliferation, and counterterrorism efforts to help offset and stay ahead of nuclear risks.

NNSA has a unique responsibility to provide an effective nuclear deterrent in a timely manner to protect our Nation and our allies. The FY 2023 budget request funds the five life extension and modernization programs that support all three legs of the triad. In FY 2023 the requested budget also supports significant investments in new production facilities for uranium processing and plutonium pit manufacturing at the fastest responsible pace. The budget request contains close to equal funding for stockpile management and production modernization, a true indication of the intent to accelerate activities by working on weapon design and production in parallel with infrastructure revitalization. The science and engineering support for the weapons program stays strong to allow for the continued development of capabilities to design and certify the stockpile without testing and to stay ahead of threats.

The Defense Nuclear Nonproliferation budget request sustains our efforts to reduce nuclear risk by eliminating, minimizing, and securing nuclear and radiological materials. In addition, the DNN portfolio request recognizes the changing world by increasing support for policy and technology development aimed at the increased proliferation risks associated with the increase in nuclear energy around the world, preparing for an increasingly complex arms control and global stability environment, and by initiating a bioassurance program. Similarly, the increased budget request for the counterterrorism and counterproliferation program is responsive to the changing threat environment.

The Naval Reactors budget request recognizes the excellent stewardship provided over the years and continues to support the high priority needs to replace aging tools, build a new spent fuel handling facility, and support the COLUMBIA-class production schedule.

The challenges NNSA faces ahead are steep and we are mindful of the resources entrusted to it. For FY 2023, NNSA scrubbed prior year balances and used available funds to offset some of the increased budget needs. NNSA, in partnership with Congress and our colleagues in the Departments of Energy and Defense, is steadfast in our commitment to fulfill vital national security mission and deliver our goals. We greatly appreciate your support.

Jill Hruby
Under Secretary for Nuclear Security and
Administrator of the National Nuclear Security Administration
U.S. Department of Energy

Jill Hruby was sworn in as the Under Secretary for Nuclear Security of the U.S. Department of Energy (DOE) and Administrator of the National Nuclear Security Administration (NNSA) on July 26, 2021. She was confirmed by the Senate on July 22, 2021.

Administrator Hruby will lead NNSA in achieving our Nation's nuclear security missions by ensuring the Nuclear Security Enterprise is bringing cutting-edge science and creativity to sustain and fully understand our stockpile without testing; providing new technologies and procedures to lower cost and reduce the time to deliver all mission requirements; staying ahead of our adversaries; and developing advanced capabilities to enhance nuclear security, arms control, and Navy reactors.

With an extensive background in science and engineering spanning more than 30 years, Jill Hruby brings a wealth of national security experience to NNSA. Prior to her nomination as Administrator, Jill Hruby served as Director of Sandia National Laboratories from 2015-17.

Since her retirement from Sandia National Laboratories, Jill Hruby served as the inaugural Sam Nunn Distinguished Fellow at the Nuclear Threat Initiative from 2018-19. In addition, she has been a member of the Defense Science Board, the National Nuclear Security Administration Defense Programs Advisory Committee, and the National Academy of Science Committee for International Security and Arms Control. She has served on a variety of technical advisory committees and non-profit organization boards. She is a frequent participant in international dialogues; a spokesperson for women in engineering; and a mentor for emerging leaders.

Hruby earned her bachelor's degree from Purdue University and her master's degree from the University of California at Berkeley, both in mechanical engineering. She has authored numerous publications and reports, holds three patents, and received an R&D 100 Award. In 2016, she received the Suzanne Jenniches Upward Mobility Award from the Society of Women Engineers. In 2017, Business Insider named her the second most powerful female engineer. Jill has received the Department of Energy Secretary's Exceptional Service Award, the National Nuclear Security Administrator's Distinguished Service Gold Award, and the Office of the Secretary of Defense Medal for Exceptional Public Service.

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COMMITTEE

STATEMENT OF

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ASSISTANT SECRETARY OF DEFENSE
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BEFORE THE

HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES

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COMMITTEE

INTRODUCTION

Chairman Cooper, Ranking Member Lamborn, and distinguished Members of the Subcommittee, it is an honor and privilege to testify before you today on behalf of the diverse Department of Defense (DoD) workforce who underpin the United States' nuclear deterrent. These dedicated Americans are the backbone of our nuclear deterrence mission.

We are living in a decisive decade as articulated in the Biden Administration's National Defense Strategy: a decade marked by dramatic changes in geopolitics, a rapidly changing global balance of military capabilities, emerging technologies, and domains of conflict in which the logic of deterrence is not well defined. The Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)) is at the forefront of U.S. efforts to sustain and modernize the U.S. nuclear deterrent, while simultaneously providing chemical and biological defense capabilities and compliance with international NCB-related treaties and agreements. As the ASD(NCB), I also serve as a senior advisor and technical expert to the Secretary and Deputy Secretary of Defense and as the Staff Director for the Nuclear Weapons Council. I take these roles very seriously, particularly in light of today's security environment and the challenges facing our enterprise.

THREAT LANDSCAPE

While the U.S. nuclear deterrent is and will remain safe, secure, and effective, the strategic threat environment in which it must do so has dramatically worsened over the past decade. Russia is completing its longstanding plan to modernize its legacy nuclear forces and is aggressively pursuing new and advanced nuclear capabilities. Russia's irresponsible nuclear saber-rattling in relation to its invasion of Ukraine has further demonstrated the importance of its diverse nuclear capabilities in its overall security strategy. China is pursuing and fielding major quantitative and qualitative improvements to its nuclear capabilities that significantly change the strategic threat they pose to the United States and our allies and partners. These combined developments are resulting in long-lasting challenges that require the United States to focus and maintain long-term attention and resources on ensuring we have a modern and credible nuclear deterrent.

NUCLEAR MODERNIZATION FOR A DYNAMIC SECURITY ENVIRONMENT

In response to this security environment, the U.S. nuclear enterprise is shifting from maintenance and sustainment of legacy systems and embarking on a long-overdue modernization effort to ensure that U.S. nuclear capabilities remain safe, secure, and effective—as well as capable of addressing emerging threats. This modernization begins with production and infrastructure efforts within the National Nuclear Security Administration (NNSA) and is dependent upon our ability to safeguard the world-class science and engineering required to maintain the nuclear stockpile without nuclear explosive testing and improve the safety, security, reliability, and survivability of the deterrent. As NWC Chair, Dr. William LaPlante stated in his testimony to your counterpart subcommittee in the Senate several weeks ago that we must ensure that our nuclear weapons and delivery system modernization programs are aligned across both the Department of Defense and the Department of Energy. Today, four major nuclear delivery system modernization programs are simultaneously underway while five warhead programs will reach milestone decisions in the coming months. These milestones include:

- The W88 Alteration (ALT) 370 achieved its First Production Unit in July 2021 and is on track for a full-scale production decision this summer. The W88 ALT 370 extends the life of the W88 without increasing the warhead’s military capability.
- The B61-12 achieved first production in November 2021, further assuring allies of our extended deterrence commitment, and is on track for a full-scale production decision in the next month.
- The W80-4 cruise missile warhead, which will be mated to the modernized Long-Range Standoff (LRSO) weapon, is scheduled to shift into production engineering in the coming months.
- The W87-1, a warhead modification that is driving modernization of the full production enterprise, is on track to enter its engineering development phase in time to begin replacing the W78 on alert in 2030.
- Finally, the W93 just entered its feasibility study phase, and will ensure the U.S. submarine-based deterrent force remains robust for the long-term and furthering opportunities for both the U.S. and United Kingdom, through its separate but parallel program, to responsibly address challenges within legacy nuclear forces.

DoD's nuclear delivery system programs are steadily progressing. The COLUMBIA-class submarine program is on track to deliver the first hull in time for its first strategic patrol in FY 2031 and meet U.S. Strategic Command requirements. The COLUMBIA-class will be equipped with a modernized Trident II D5 strategic weapon system, which will ensure the effectiveness of the sea-based leg of the Triad through FY 2084. The Sentinel program—formerly known as the Ground Based Strategic Deterrent—is executing its aggressive schedule, and the Air Force is actively mitigating risks to achieving on-time delivery in the mid-2030s. Sentinel will close current ICBM capability gaps; provide increased accuracy, enhanced security, and improved reliability; and lower lifecycle costs. Sentinel will fulfill the requirements of the land-based leg of the Triad and remain adaptable to new threat environments.

The air-leg of the Triad is modernizing as well. The B-21 Raider is both a conventional and nuclear-capable bomber that will eventually replace the nuclear-capable B-2 and conventional B-1 bombers, supporting the Triad with a visible and flexible deterrent capability. The first test aircraft entered formal ground test in March 2022. The B-21 will carry the LRSO, a replacement for the nuclear-armed AGM-86B Air Launched Cruise Missile. LRSO is a joint effort involving DoD and DOE/NNSA, with the Air Force responsible for cruise missile development and integration and DOE/NNSA responsible for the W80-4 warhead. This program will maintain the viability of the B-52H fleet and ensure the U.S. continues to provide a visible, flexible, tailorable, and credible nuclear deterrent through the airborne leg of the Triad. The F-35 Dual Capable Aircraft (DCA) program remains on schedule and is an important aspect of our support to the North Atlantic Treaty Organization's (NATO) nuclear deterrent. The F-35A DCA ensures the continued capability and mission effectiveness of Allied forces. As the Vice-Chair of the NATO High Level Group, I support our Allies in matters concerning the safety, security, and survivability of NATO's nuclear deterrent. These and other efforts in support of our NATO Allies will continue to be of critical importance in the current and future security environment.

Underpinning the strategic Triad is the Nation's nuclear command, control, and communications system (NC3). DoD has embarked on a sweeping and long overdue modernization of NC3 to improve the efficiency and alignment of the 200+ individual systems that compose the overall NC3 architecture. This modernization is essential to continue to provide assured and resilient command and control to the President.

Ensuring U.S. nuclear forces remain safe and secure requires collaboration within the nuclear enterprise. Stakeholders are continuously collaborating on U.S. nuclear weapons surety policies and activities. Nuclear security threat capability assessments are being updated to reflect evolving adversary cyber, asymmetric, and conventional capabilities against nuclear command and control systems, physical security systems, and material supply chains. We continue to execute a robust DoD Force-On-Force Exercise Program that assesses adversary capabilities against legacy and future nuclear weapons security systems. These exercises evaluate the effectiveness of current security policies and system standards against assessed threats. If and when gaps are identified, we explore, test and implement innovative material and policy mitigations. These solutions are then shared across the nuclear enterprise to identify efficiencies and promote cross-agency collaboration. To that end, reviews such as the safety, security, and reliability failsafe review directed by the FY2022 National Defense Authorization Act (NDAA) are key to having continued assurance in the security and reliability of U.S. nuclear systems.

In a reflection of the kind of collaboration and integration nuclear modernization requires, the Department, led by the Under Secretary of Defense for Policy, conducted a review of U.S. nuclear posture over the past year. This collaborative effort resulted in continued support for modernization of the Triad and the resulting guidance emphasizes the need for strong cooperation between all partners in the nuclear enterprise. I applaud the success exhibited by this process and remain committed to leading the NCB organization through Nuclear Posture Review implementation efforts going forward.

NUCLEAR WEAPONS COUNCIL

As the Staff Director for the NWC, I am happy to report that the NWC is dedicated to enabling a modern, flexible, and balanced stockpile underpinned by a resilient and responsive production enterprise. The NWC recognizes that production issues are of great interest to this subcommittee and have garnered significant public attention. We are committed to working with our NNSA partners, through the NWC process, to mitigate production and infrastructure challenges. I want to thank our NNSA partners for their diligence and transparency. The NWC depends on the close relationship with NNSA to successfully satisfy its statutory responsibilities, which we have done since the inception of the Council. As modernization progresses, the NWC

will remain a focal point for both Departments to answer critical questions and make key decisions.

CONCLUSION

In conclusion, I cannot overstate the importance of ensuring the successful execution of key programs and the development and funding of plans to continue to ensure that the United States retains a safe, secure, and effective deterrent. On behalf of the NCB organization, I would like to thank this Committee for its longstanding, bipartisan support for our nuclear deterrent mission and for the dedicated professionals across the nuclear enterprise. Thank you for your time today, I look forward to your questions.

Deborah G. Rosenblum

Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)), and Performing the Duties of Assistant Secretary of Defense for Industrial Base Policy (ASD(IBP))

Ms. Deborah G. Rosenblum currently serves as the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)). In this capacity, she is the principal advisor to the Secretary, Deputy Secretary, and Under Secretary of Defense for Acquisition and Sustainment (A&S) on nuclear weapons, nuclear energy, and biological and chemical programs.

She is also currently performing the duties of the Assistant Secretary of Defense for Industrial Base Policy, serving as the principal advisor to the Secretary, Deputy Secretary, and Under Secretary of Defense for Acquisition and Sustainment (A&S) on industrial base policies. Her principal duty is the overall supervision of the Department of Defense's efforts to develop and maintain the defense industrial base of the United States to ensure a secure supply of materials critical to national security.

Prior to her position as Assistant Secretary of Defense, she was the Executive Vice President at the Nuclear Threat Initiative (NTI). As part of NTI's executive leadership team, she helped to oversee the organization's operations, development, and programs, managing an annual operating budget of \$15-20 million.

At NTI, Rosenblum led the successful development of Connecting Organizations for Regional Disease Surveillance (CORDS) as an independent, self-sustaining global network of regional disease surveillance groups. She served on the board of CORDS, where she promoted good governance in her role as finance chair. Rosenblum also helped manage NTI's work on security issues related to China and regularly travelled there to meet with government officials and non-governmental organizations. Additionally, she led NTI's Middle Eastern partnerships, with a focus on the Levant region, where she travelled frequently for programmatic work as well as speaking engagements on behalf of NTI. Rosenblum has served on the board of the Herbert Scoville Jr. Peace Fellowship since 2012. From 2017 to 2018, Rosenblum served as an N Square fellow focused on driving innovation in the nuclear field. Now, she currently serves as an advisor to the fellowship program.

Rosenblum spent seven years as vice president of The Cohen Group, an international consulting firm. She served in senior positions with the U.S. Department of Defense, in the areas of homeland defense, peacekeeping operations and support, nuclear forces, and counter-proliferation policy. Rosenblum represented the United States as a negotiator with the Democratic People's Republic of Korea on multi-year bilateral negotiations around its nuclear program. Rosenblum holds a master's degree from Columbia University's School of International and Public Affairs, and is a Phi Beta Kappa graduate with a bachelor's degree from Middlebury College. She is fluent in French.

**Statement of Dr. John Plumb
Assistant Secretary of Defense for Space Policy
before the
House Armed Services Committee Strategic Forces Subcommittee (HASC-SF)
on Fiscal Year 2023 Nuclear Forces
May 17, 2022**

Introduction

Chairman Cooper, Ranking Member Lamborn, members of the Strategic Forces Subcommittee: thank you for inviting me to testify before you on the Fiscal Year (FY) 2023 President's Budget request for U.S. nuclear weapon and warhead modernization and sustainment plans. I am honored to appear alongside Under Secretary Hruby, Assistant Secretary Rosenblum, Vice Admiral Wolfe, and Lieutenant General Dawkins.

Earlier this year the Department of Defense (DoD) completed its strategy reviews, including the 2022 Nuclear Posture Review (NPR), in close consultation with interagency partners, outside experts, allies, and partners. The 2022 NPR represents a comprehensive, balanced approach to U.S. nuclear strategy, policy, posture, and forces. Maintaining a safe, secure, and effective nuclear deterrent – and strong and credible extended deterrence commitments – remains the top priority for the Department. This top priority is further reinforced by Russia's invasion of and its nuclear weapons rhetoric regarding Ukraine, and by China's rapid nuclear weapons modernization and expansion.

Committed to that priority, the FY 2023 President's Budget includes \$34.4 billion dollars for the nuclear enterprise, including fully supporting the modernization of the nuclear Triad, modernization of our nuclear security infrastructure, and investment in our nuclear command, control, and communications (NC3) architecture. The United States is committed to that modernization, and committed to sustaining fielded systems through the transition to their replacements.

The request of \$34.4 billion is nearly \$7 billion more than the FY 2022 request. It includes funding the B-21 bomber and the Long-Range Standoff (LRSO) weapon for the air leg; the Ground-Based Strategic Deterrent (GBSD) for the ground leg, which is now called Sentinel; and the Columbia nuclear-powered ballistic missile submarine (SSBN) and the Trident II life-extension and life-extension 2 for the sea leg. At the same time, and after considering all viewpoints, DoD concluded in the NPR that the nuclear sea-launched cruise missile (SLCM-N) should be canceled and the B83-1 gravity bomb should be retired.

The NPR underscores the U.S. commitment to reducing the role of nuclear weapons and reestablishing U.S. leadership in arms control. The United States will continue to emphasize strategic stability, seek to avoid costly arms races, and facilitate risk reduction and arms control arrangements where possible. Our nuclear enterprise will continue to support U.S. nuclear nonproliferation, nuclear security, counter proliferation, and counterterrorism priorities.

U.S. nuclear forces remain the bedrock of our deterrence architecture. They are foundational to every defense priority established in the National Defense Strategy, and they remain indispensable to our national security. For the foreseeable future, nuclear weapons will continue to provide unique deterrence effects that no other element of U.S. military power can replace.

Nuclear Posture Review

As directed by Secretary Austin, the NPR was conducted in parallel with the 2022 Missile Defense Review (MDR), both of which are nested under the 2022 National Defense Strategy (NDS). The NPR process was inclusive, involving a large group of stakeholders, and adopted a deliberate and rigorous approach to ensure that senior leader decisions would be fully informed. My colleagues appearing before you today and their staffs, as well as other representatives from across DoD and interagency partners, were deeply involved in preparing the NPR. A classified version of the NPR was delivered to Congress alongside classified versions of the NDS and the MDR in late March. We look forward to delivering an unclassified version of the NPR, and discussing it in detail, at a later date.

The NPR was structured in three phases: first, we examined the security environment; second, we considered how the security environment shaped our assessment of the roles of nuclear weapons and our nuclear strategy; third, we considered the requirements and capabilities needed to achieve our strategy. Within this framework, the review also considered the role of arms control in shaping deterrence requirements; risk-mitigation strategies given uncertainties in the environment; the stability implications of emerging technologies; approaches to integrated deterrence; and opportunities to leverage technology innovation. As directed by the President, the NPR also included an examination of steps to reduce the role of nuclear weapons.

Ultimately, the NPR provides a clear-eyed assessment of the environment for nuclear deterrence and the security challenges we and our allies and partners face. The NPR strikes the right balance between: 1) the steps necessary to ensure a safe, secure, and effective nuclear deterrent and strong and credible extended deterrence; and 2) other necessary approaches to reduce the risk of nuclear war and the global salience of nuclear weapons.

The Security Environment

The United States faces heightened risk associated with strategic competition and military confrontation, resulting in a strong sense of urgency to sustain and strengthen nuclear deterrence and take steps to reduce the risks of nuclear war. The security environment is characterized by an increased reliance on nuclear weapons in the strategies and forces of our competitors. For the first time, the United States will need to deter two major nuclear powers—China and Russia—each possessing large, sophisticated global and theater nuclear forces. Adding to this heightened risk, North Korea continues to expand and diversify its own nuclear forces, increasing its ability to threaten the United States and our regional allies and partners.

Compounding these challenges is the uncertain prospect for new arms control agreements that traditionally have constrained the nuclear threats we face; the advance of non-nuclear capabilities

that can achieve strategic impact; and the possibility of new escalation risks in an increasingly complex operating environment.

China. The People's Republic of China (PRC) has embarked on an ambitious expansion, modernization, and diversification of its nuclear forces and established a nascent nuclear triad. As recently as 2020, DoD assessed that China would at least double the size of its nuclear stockpile, then estimated in the low-200s, within the decade. Since then, China has accelerated its efforts and may possess up to 700 deliverable nuclear warheads by 2027, and will likely have about 1,000 deliverable warheads by 2030. China has commenced building at least three solid-fueled intercontinental ballistic missile (ICBM) silo fields, which will cumulatively contain hundreds of new ICBM silos. While the end state resulting from China's nuclear expansion is uncertain, the current trajectory points to a large, diverse nuclear arsenal with a high degree of survivability, reliability, and effectiveness. China is also implementing a launch-on-warning posture for its nuclear forces for the first time. The combination of rapid growth in nuclear forces and the change in posture will provide China with new options to leverage nuclear weapons in peacetime, crisis, and war, and marks a departure from its traditional minimum deterrence posture.

To support its growth in nuclear capability, China is increasing its capacity to produce and separate plutonium by constructing fast reactors and reprocessing facilities. Although China has stated that this infrastructure is for civilian nuclear technology programs, the United States has strong concerns that this infrastructure will also support China's expanding nuclear weapons program.

In the near term, we must continue to factor China's nuclear expansion into our own strategy and forces, as well as any arms control and risk reduction approaches with Russia. We need to understand the dynamics of three party deterrence as part of both peacetime competition and crises where opportunistic aggression by either China or Russia is possible.

Russia. Russia continues to emphasize nuclear weapons in its military posture and strategy. It is modernizing and expanding its nuclear forces, and has irresponsibly brandished these capabilities in support of its revisionist security policy – most recently in its unjustified invasion of Ukraine. Russia's modern nuclear arsenal, which is expected to grow further, presents an enduring existential threat to the United States and our allies and partners.

For twenty years Russia has pursued a wide-ranging modernization program, replacing legacy strategic nuclear systems within the constraints of the START and subsequent New START treaties, and steadily expanding and diversifying nonstrategic nuclear systems that pose a direct threat to NATO and its neighbors. Russia is pursuing several novel nuclear-capable systems designed to hold the U.S. homeland and our allies and partners at risk. In addition to the approximately 1,550 deployed warheads on strategic systems covered by the

New START Treaty, Russia probably has up to 2,000 nonstrategic nuclear warheads, which are largely not covered by any arms control treaty.

Russia's nuclear saber-rattling is irresponsible and dangerous, and heightens the risk of escalation. As President Biden recently stated, "No one should be making idle comments about the use of nuclear weapons or the possibility of the need to use them." Russia has more than once joined the United States and other nuclear powers in declaring that a nuclear war cannot be won and must never be fought. Yet its current rhetoric and actions make clear that Russia believes such irresponsible rhetoric is acceptable behavior.

In contrast, the United States believes all nuclear-armed states have an obligation to act responsibly. We have chosen to act with restraint with respect to our peacetime nuclear activities, in the interest of avoiding actions that could unintentionally add to nuclear tensions or be misinterpreted. But our acts of restraint should not be misconstrued. Russia's attempts at nuclear intimidation will not work: our commitment to Article 5 and to the security of our NATO Allies remains ironclad. We have full confidence in the ability of our nuclear forces to perform their mission. The readiness of these forces remains unchanged, and we will continue to undertake routine and scheduled operational activities to maintain that readiness. This includes future planned tests of our systems, including ballistic missile test launches, which will be properly notified as required by the New START Treaty. We will also continue to work with our Allies to strengthen NATO's nuclear deterrence posture.

Non-Nuclear Strategic Capabilities. China and Russia are also working to augment their growing nuclear forces with a broader set of kinetic and non-kinetic capabilities, including cyber, space, information, and advanced conventional strike. Each seeks to integrate these multi-domain capabilities to support coercive strategies and enable military campaigns intended to present the Joint Force with operational dilemmas. China and Russia also likely possess capabilities relevant to chemical and biological warfare that could pose a threat to U.S., allied, and partner forces, as well as civilian populations.

The introduction and growing role of non-nuclear strategic capabilities will raise new challenges for deterrence and managing escalation risk. These capabilities could create complex and unpredictable pathways for conflict escalation that may be unfamiliar to us, especially in domains such as cyber and space, where there is a lack of collective experience, common understanding, and established norms of behavior.

Democratic People's Republic of Korea (DPRK). North Korea remains a persistent threat, and has continued developing nuclear weapons and associated delivery systems that pose a growing threat to the United States and its allies and partners. Since January this year, and in violation of numerous United Nations Security Council resolutions, the DPRK has conducted a number of missile tests, including tests of ICBMs, an intermediate-range ballistic missile, purported hypersonic glide vehicles, cruise missiles, and multiple types of solid-propellant short range ballistic missiles. DPRK leadership likely views expanding its nuclear and

missile forces as essential to ensure regime security and to enable coercive military threats and actions. The DPRK also possesses non-nuclear capabilities that could inflict catastrophic harm. As a result, the DPRK poses an increasing risk to the U.S. homeland and U.S. forces in theater, as well as to our regional allies and partners.

Iran. The United States is committed to the principle that Iran should not acquire a nuclear weapon. A diplomatic solution, not a military one, is the Department's preferred approach to achieving this goal. Although Iran does not today possess a nuclear weapon, its pursuit of nuclear activities that were previously constrained by the Joint Comprehensive Plan of Action (JCPOA) continues to be of deep concern. Under the JCPOA, Iran's enrichment of uranium was limited and all pathways to a nuclear bomb were blocked. But that is no longer the case. Iran is much closer to having enough fissile material for a nuclear bomb right now than it ever was when the JCPOA was in operation.

Iran also maintains a large and growing regional missile capability. Its proliferation of missiles and unmanned aerial systems poses a threat to U.S. forces, allies, and partners in the Middle East and beyond. Although Iran does not currently field missiles that can reach the U.S. homeland, it continues to pursue a space launch vehicle program, which could shorten the pathway to a long-range missile capability.

Roles of Nuclear Weapons, Nuclear Strategy, and Declaratory Policy

The roles of U.S. nuclear weapons are to deter strategic attack, assure allies and partners, and achieve U.S. objectives if deterrence fails. The United States reaffirms a nuclear strategy that relies on nuclear weapons to deter all forms of strategic attack. In implementing this strategy, we will continue to tailor our deterrence approach to specific adversaries by holding at risk those things that their leadership values most, and relying on nuclear weapons where they are most effective in influencing an adversary's decision calculus.

As part of the NPR process, the President determined the U.S. nuclear declaratory policy: "As long as nuclear weapons exist, the fundamental role of U.S. nuclear weapons is to deter nuclear attack on the United States, our allies, and partners. The United States would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or our allies and partners."

This declaratory policy maintains a very high bar for the employment of nuclear weapons while also retaining ambiguity regarding the specific circumstances of any such potential use. This policy also provides a strong signal of assurance to allies and partners, and complicates an adversary's calculus. It does not in any way increase our reliance on nuclear weapons.

In arriving at this declaratory policy, a broad range of options were considered, including "No First Use" and "Sole Purpose" formulations. The President concluded that adopting a "No First Use" or "Sole Purpose" policy would result in an unacceptable level of risk in light of the range of non-nuclear capabilities being developed and fielded by competitors that could inflict strategic-level damage to the United States and its allies and partners. Some allies and partners

are particularly vulnerable to attacks with non-nuclear means that could produce devastating effects. We retain the goal of moving toward a sole purpose declaration in the future and will work with allies and partners to identify concrete steps that would allow us to do so.

Nuclear Force Posture and the President's Budget

The Department is committed to ensuring that our nuclear deterrent is safe, secure, and effective and that our extended nuclear deterrence commitments remain strong and credible. Our nuclear forces are foundational to our national security, our defense strategy, and the interests of our allies and partners.

Secretary Austin has testified that current U.S. nuclear forces have been extended far beyond their original service lives, and the tipping point, where we must simultaneously overhaul these forces, is now here. It is vital to DoD that modernization of the ground-, sea-, and air-based legs of the Triad continue on schedule, and the FY 2023 President's Budget is faithful to this objective.

The FY 2023 President's Budget, which reflects and supports the 2022 NPR, invests \$34.4 billion in Nuclear Enterprise Modernization. This request reflects full funding for recapitalization of all three legs of the nuclear Triad, as well as modernization of U.S. nuclear command, control, and communications (NC3) systems.

Ground Leg. The request for LGM-35A Sentinel, formerly known as the Ground-Based Strategic Deterrent, is \$3.6 billion. Sentinel, currently in the Engineering and Manufacturing Development phase, features increased capability, enhanced security, improved reliability, and lowered lifecycle sustainment costs over the Minuteman III ICBM system it will replace. The first Sentinel flight test is expected in FY 2024.

Sea Leg. The request is \$6.3 billion for procurement and research, development, technology, and evaluation (RDT&E) for the COLUMBIA-class SSBN, which will replace OHIO-class SSBNs beginning in October 2030. COLUMBIA class SSBNs will provide continuous sea-based strategic deterrence into the 2080s, forming the most survivable leg of the Triad. An additional \$1.7 billion is requested for the Trident II (D5) submarine-launched ballistic missile (SLBM) D5LE and D5LE2 life-extension programs. D5LE, currently in production, will be deployed on both OHIO and COLUMBIA platforms. D5LE2, which will leverage the highly reliable solid rocket motor design and couple it with modern avionics electronics, guidance and structures, will replace D5LE starting in FY 2039.

Air Leg. The request is \$5.0 billion to fund the procurement and development of the B-21 Raider bomber, a penetrating aircraft incorporating proven, mature technologies that represents a key component to the joint portfolio of conventional and nuclear deep-strike capabilities. The request is \$1.0 billion for development of the LRSO weapon, which will replace the 1980s-era AGM-86B Air Launched Cruise Missile (ALCM). LRSO weapons will be capable of penetrating and surviving advanced Integrated Air Defense Systems from significant stand-off ranges to hold strategic targets at risk in support of the

Air Force's nuclear deterrence operations core mission. The Department will also continue with F-35A Dual-Capable Aircraft certification, which is scheduled to take place in FY 2024.

The FY23 President's Budget reflects the President's decision to cancel the SLCM-N program. In the NPR, DoD concluded that current capabilities and others that will be fielded in the near- to mid-future provide sufficient means to deter the threat of adversary limited nuclear use in a regional conflict. These capabilities include the W76-2 low-yield SLBM warhead, currently available ALCMs, the future LRSSO weapon, and upgraded fifth-generation F-35A dual-capable aircraft armed with U.S. nuclear gravity bombs. Additional factors include the estimated cost of the SLCM-N program in light of other modernization priorities, the time to develop and field the system, the operational and readiness constraints such a system would place on our attack submarines and their crews, and the limited arms control leverage that SLCM-N likely would have provided in future negotiations. For these reasons, and after evaluating recommendations from civilian and military leaders, the President, with the recommendation of Secretary Austin, directed the cancellation of the SLCM-N program.

The budget also reflects the President's decision to retire the B83-1 nuclear gravity bomb. In the near term, DoD will rely on other existing capabilities to hold at risk adversary hard and deeply buried targets. The Department, in collaboration with its interagency partners, will identify and assess options for an enduring capability to address this class of targets.

Allies and Partners

Our alliances and partnerships are vital to our national security, serving as force multipliers for our military. These relationships and the security architecture they underpin are one of our nation's greatest strengths, and constitute a strategic advantage our adversaries can never hope to match. Effective assurance of allies and partners is built on a shared view of the security environment and regional deterrence challenges; a commitment to risk- and burden-sharing; modern and effective nuclear forces; robust consultation processes; and allies' confidence that the United States has the will and capability to meet its mutual defense commitments. As long as allies and partners face strategic threats, extended nuclear deterrence will remain a pillar of our regional security architectures.

Nuclear deterrence has been at the core of the NATO Alliance since its inception, and the allies have repeatedly reaffirmed that as long as nuclear weapons exist, NATO will remain a nuclear Alliance. A strong, cohesive NATO Alliance with a clear nuclear mission remains essential to deter aggression and promote peace and stability in the Euro-Atlantic Region – a stance that is even more important given Russia's aggression against Ukraine and Russian nuclear weapons rhetoric directed toward NATO member nations. We greatly value our relationships on strategic matters with both the United Kingdom (UK) and France. As separate centers of decision-making, the contributions of the UK and France to NATO's nuclear posture remain critical to the Alliance's overall deterrence and defense posture.

Our extended deterrence relationships with both Japan and the Republic of Korea are instrumental to deterring threats in East Asia, including those emanating from the DPRK. We

will continue to hold extended deterrence dialogues with the Republic of Korea, Japan, and Australia, and invigorate these vital alliances in support of U.S. national security. We look forward to taking steps to enhance and strengthen these extended deterrence relationships as we confront growing regional threats.

Arms Control

The United States does not rely on deterrence alone to reduce the risks of nuclear war. Arms control and other forms of risk reduction are essential complements to deterrence. The Department recognizes the need for a comprehensive and balanced approach that places renewed value on arms control and non-proliferation, in order to strengthen stability, head off costly arms races, and reduce the salience of nuclear weapons globally.

Although current conditions for arms control are challenging given China's nuclear expansion and Russia's aggression in Ukraine, we will continue to prepare for engagement and pursue arms control where it is in our national security interest. As conditions permit, the United States will continue to prioritize realistic, pragmatic arms control and risk-reduction measures with Russia and China, as one step towards reducing the role of nuclear weapons globally and in our national security strategy. The U.S. objective is to define practical, agreed steps to advance the goals of greater transparency and predictability, enhanced stability, reduced risk of war or escalation during war, reduced global salience of nuclear weapons and, ultimately, a world without nuclear weapons.

Russia will remain a focus of U.S. efforts given the size, diversity, and continuing modernization of its nuclear arsenal. Although the U.S.-Russia Strategic Stability Dialogue is currently suspended due to Russia's continued aggression in Ukraine, we will be prepared to re-engage if and when conditions allow. Any future discussions will need to account for China's nuclear expansion in order to ensure our ability to manage the challenges posed by two major nuclear powers. Our goals in engaging with China are to ensure "guardrails" in addressing strategic risks and to lay the foundation for long-term arms control discussions.

Nuclear Security Enterprise

Fielding a safe, secure, and effective nuclear deterrent well into the future requires a weapon production enterprise that is resilient, responsive, and capable of responding in a timely way to new geopolitical, technical, operational, or programmatic risks. We will achieve this goal through the ongoing partnership of DoD and the Department of Energy/National Nuclear Security Administration (DOE/NNSA), including through the Nuclear Weapons Council, improved coordination, a strengthened approach to managing risk in the nuclear enterprise, production-based resilience, more robust exploitation of science and technology advances, and workforce initiatives. DoD will continue to advocate for investments in DOE/NNSA that will sustain a safe, secure, reliable, and effective nuclear stockpile that can be certified without nuclear explosive testing and will be responsive to the threats we face.

Conclusion

The National Defense Strategy sets as our core challenge the need to sustain robust deterrence across the board. Our nuclear forces, NC3, and our nuclear production infrastructure are essential to meet this challenge. In the current security environment, and given the dangers we face, we will remain focused on sustaining and modernizing these capabilities. Managing such a complex set of programs will require a disciplined approach.

The security environment also demands that we consider other, complementary steps to reduce the risks of nuclear war, to include: adopting a pragmatic approach to arms control; developing integrated approaches to tailored deterrence; managing escalation risk and increasingly complex cross-domain deterrence dynamics; and reducing our reliance on nuclear weapons in ways that enhance our security.

Our nuclear forces remain the bedrock of U.S. deterrence architecture. They are foundational to every priority established in the National Defense Strategy, and they remain indispensable to U.S. national security – as well as the security of our allies and partners. It is my honor to work with my colleagues on this panel and with the Congress on these critical issues.

Thank you, and I look forward to your questions.

Dr. John F. Plumb
Assistant Secretary of Defense for Space Policy

Dr. John F. Plumb was confirmed in March 2022 as the first Assistant Secretary of Defense for Space Policy. In this role he is responsible for the overall supervision of policy for the Department of Defense for space warfighting. His policy portfolio encompasses the Department's strategic capabilities for integrated deterrence: space, nuclear weapons, cyber, missile defense, electromagnetic warfare, and countering weapons of mass destruction. He also serves as the Principal Cyber Advisor to the Secretary of Defense.

Dr. Plumb has served in various national security roles both in and out of uniform for nearly three decades. As an active duty US Navy submarine officer, he served on a fast attack Los Angeles-class submarine and as an instructor at the Navy's nuclear power school. He then transitioned to the Navy reserves, commanding eight different reserve units over 20 years. As a civilian he held previous roles in the Senate, the Pentagon, and on the National Security Council staff at the White House. Prior to his confirmation he spent several years working for Federally Funded Research and Development Centers, first as a Senior Engineer at the Rand Corporation, and then as Principal Director, Chief of Government Relations for the Aerospace Corporation.

He holds a B.S. in Physics from the University of Notre Dame, and an M.S. in Physics and Ph.D. in Aerospace Engineering from the University of Colorado. His academic awards include the University of Notre Dame Student Leadership Award and an American Association for the Advancement of Science (AAAS) Congressional Science & Technology Fellowship sponsored by the Institute of Navigation. His personal military decorations include the Legion of Merit, the Meritorious Service Medal, and the Navy Commendation Medal. His civil service awards include the Office of the Secretary of Defense Exceptional Public Service Award, the Department of State Superior Honor Award, and the Secretary of Energy Achievement Award.

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THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

STATEMENT
OF
VICE ADMIRAL JOHNNY WOLFE, USN
DIRECTOR, STRATEGIC SYSTEMS PROGRAMS
BEFORE THE
SUBCOMMITTEE ON STRATEGIC FORCES
OF THE
HOUSE ARMED SERVICES COMMITTEE
ON
FY 2023 BUDGET REQUEST FOR NUCLEAR FORCES AND
ATOMIC ENERGY DEFENSE ACTIVITIES
17 MAY 2022

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STRATEGIC FORCES SUBCOMMITTEE

Introduction

Chairman Cooper, Ranking Member Lamborn, and distinguished Members of the subcommittee, thank you for this opportunity to discuss the sustainment and recapitalization of the sea-based leg of the nuclear triad. It is an honor to represent the Navy's Strategic Systems Programs (SSP) and the contributions the Navy provides to our national and global security through Sea Based Strategic Deterrence.

As ADM Richard, Commander, US Strategic Command, testified before this committee just last month, "Every operational plan in the DoD, and every other capability we have rests on the assumption that strategic deterrence, and in particular nuclear deterrence, will hold. If strategic or nuclear deterrence fails, integrated deterrence and no other plan or capability in the DoD will work as designed. The Nation's nuclear forces underpin integrated deterrence and enable the U.S., our Allies and partners to prevent, and if necessary, confront aggression around the globe using all instruments of national power." Nuclear weapons remain the most powerful and destructive weapons known to humanity. As long as nuclear weapons exist, we have a special charge to be responsible custodians of our nuclear capabilities and work with a sense of urgency to create a security environment that would allow for their elimination. SSP takes this charge very seriously.

SSP's core mission comprises two fundamental lines of effort: the safety and security of our Nation's strategic assets entrusted to the Navy; and the design, development, production, and sustainment of the Navy's Strategic Weapons System (SWS). We strive to maintain a culture of excellence, underpinned by rigorous self-assessment, to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission. We focus unremittingly on our tremendous responsibility for the custody and accountability of our Nation's nuclear assets. The men and women of SSP, our Sailors, our Marines, our Navy Masters at Arms, our Coast Guardsmen, and our industry partners remain dedicated to supporting the strategic deterrence mission, to responding to the emerging needs of our warfighter, and to protecting and safeguarding our Nation's assets with which we are entrusted. We certainly could not do this without the support from this Committee.

The Nation's nuclear triad consists of intercontinental ballistic missiles, heavy bombers, and ballistic missile submarines (SSBNs) equipped with submarine-launched ballistic missiles (SLBM). These platforms and their associated weapons systems are essential to the very foundation of our Nation's security and survival. The Navy must defend the Homeland with an assured nuclear deterrent from beneath the sea to deter all forms of strategic attack. While the U.S. nuclear arsenal remains safe, secure and effective, most U.S. nuclear deterrent systems – including the SSBN fleet – are operating beyond their original design life, increasing concerns about mission effectiveness, reliability and availability. Replacement programs are ongoing, but there is little or no margin between the end of useful life of existing programs and the fielding of their replacements.

The U.S. Navy provides the most survivable leg of the nuclear triad with the interdependent *Ohio*-Class SSBNs and the TRIDENT II D5 SWS. The SSBN fleet is responsible for more than 70 percent of the Nation's operationally deployed nuclear warheads that are subject to the New START Treaty. As the Navy carefully manages the approach to end of life of *Ohio*-Class SSBNs, addressing the viability of the SWS throughout the life of the *Columbia*-Class SSBNs remains a top priority. *Columbia*-Class SSBNs will ensure the effectiveness and availability of the nation's Sea Based Strategic Deterrent through the 2080s. The currently deployed TRIDENT II D5 Life Extension (D5LE) missiles will support initial load-outs on *Columbia*, but modernization of the D5LE SWS, via D5LE2, is required to support later *Columbia*-Class missile inventory and seamlessly sustain USSTRATCOM requirements. D5LE2 will ensure the SWS will be flexible and adaptable in order to maintain demonstrated performance and survivability despite the dynamic threat environment.

As the fourteenth Director, it is my highest honor to serve as the program manager, technical authority, safety and security lead, regulatory lead, and U.S. Project Officer under the Polaris Sales Agreement (PSA) for the Naval Nuclear Weapons Program. Most importantly, I am honored to represent the men and women of SSP, comprising approximately 1,500 Sailors, 1,000 Marines, 300 Coast Guardsmen, 1,400 civilians, and thousands of contractor personnel. It is my

most critical goal to ensure they are poised to execute the mission with the same level of success, passion, and rigor both today *and* tomorrow as they have since our program's inception in 1955.

SWS Sustainment on *Ohio*-Class SSBN and Procurement for *Columbia*-Class SSBN

The fragile relationship between sustainment of our legacy systems and the development and production of their replacements is an ever-present factor in the calculus of effectively deterring adversaries. The Navy's highest priority acquisition program is the *Columbia*-Class submarine. The *Ohio*-Class SSBNs will begin decommissioning in the late 2020s, and the *Columbia*-Class must be ready to begin patrols no later than early FY31. Recapitalizing our SSBNs is a significant investment that only happens every other generation, making it critically important that we do it right and on time. Delays to the Navy's SSBN modernization plan are not an option. The continued assurance of our sea-based strategic deterrent requires not only a next class of ballistic missile submarines, but equally critical, a credible SWS – to include not just the weapon system itself, but the infrastructure and the people as well. The Navy is taking the necessary steps to ensure that the next generation deterrent is designed, built, delivered, and tested on time and provides flexibility and adaptability in a dynamic threat environment.

To lower development costs and leverage the proven reliability of the TRIDENT II D5 SWS, the *Columbia*-Class SSBN will enter service with the same functionality and performance of the currently deployed TRIDENT II D5 SWS, including the life extended TRIDENT II D5 missile, which resides on today's *Ohio*-Class submarines. Maintaining a common SWS during the transition between existing and successor submarine platforms allows the Navy to leverage a mature material and knowledge enterprise, thus reducing programmatic costs and risks. Life extended missiles will be shared with both the *Ohio* and *Columbia*-Class submarines in the U.S. and, under the auspices of the PSA, with the United Kingdom (UK) *Vanguard*-Class and *Dreadnought*-Class submarines into the 2040s.

TRIDENT II D5 Life Extension and Life Extension 2

The TRIDENT II D5 SWS capability has been deployed on the *Ohio*-Class ballistic missile submarines for nearly three decades and is planned to be deployed more than 55 years. This demand to maintain demonstrated high performance while extending the service life past initial

design requirements required a missile life extension effort in order to support the *Ohio*-Class submarine service life and, in concert with the Shipboard Modernization Program for shipboard systems, to serve as the initial SWS for the *Columbia*-Class SSBN. The D5LE will ensure an effective and credible SWS on both the *Ohio*-Class and *Columbia*-Class SSBNs into the 2040s.

As the Navy carefully manages the approach to end of life of our *Ohio*-Class SSBNs, we must address the viability of the SWS throughout the life of the *Columbia*-Class SSBNs. A minimum of twelve *Columbia*-Class SSBNs will replace today's 14 *Ohio* SSBNs and beginning in FY30, D5LE missiles will support initial load-outs on *Columbia* (Hulls 1-8). Production of additional D5LE missiles is not practical due to obsolete parts and the lack of a robust industrial base. The TRIDENT II D5 Life Extension 2 (D5LE2) program is required to modernize the SWS to support *Columbia*-Class missile inventory starting in FY39 (targeting Initial Fleet Introduction – or, IFI – on *Columbia* Hull 9). It will be incorporated on all follow on Hulls as well as Hulls 1-8 during their Extended Refit Period from FY39-49 to continue to meet USSTRATCOM requirements. D5LE2 will ensure the weapon system maintains demonstrated performance and remains survivable while facing a dynamic threat environment driven by two near peer competitors until *Columbia* end of life.

D5LE2 is a hybrid of pull-through cost-effective technology (e.g., solid rocket motors, ignitors) and redesigned and updated components (e.g., avionics, guidance, system architecture). D5LE2 is structured to maintain today's unmatched reliability and demonstrated performance, while unlocking untapped system potential to efficiently respond to emerging needs and to maintain a credible Sea Based Strategic Deterrent.

As directed in the 2018 Nuclear Posture review, SSP executed system architecture studies in FY20-22 to evaluate solutions to problems associated with emerging threats, supportability, and adaptability required to address challenges in a dynamic threat environment. Additionally, activities focused on missile and guidance technology to determine the effective composition of redesign, remanufacture, and pull-through of highly reliable components. This ensures longer-lead, unique SLBM subsystems are mature for a Preliminary Design Review in FY28, Critical Design Review in FY32, first flight off a pad in FY33, Low Rate Initial Production in FY34 and flight testing off a manned platform in FY36. FY23 activities continue the refinement of systems

studies and critical Missile and Guidance Technology work while beginning focused subsystem redesign and industrial base development activities for the D5LE2 program.

Unlike SLBM programs of the past, D5LE2 does not have the benefit of a healthy industrial base that comes from maintaining production and continuous development. These efforts will be critical to reconstituting the SLBM industrial base to restart production on critical components whose production lines were shut down over the last decade and to build a workforce to design and develop subsystems to meet unique nuclear weapons surety requirements. The Administration recognizes the need for D5LE2 and will prioritize near-term investments to ensure that D5LE2 is effective in the expected threat environment and delivers on time. In short, full support of D5LE2 today is vital to achieving 2039 IFI and to embarking on a path that maintains an SLBM deterrent capability through the service life of the *Columbia* Class SSBN.

Warhead and Reentry Body Activities

The Navy is also working in partnership with the Department of Energy's (DOE) National Nuclear Security Administration (NNSA) to refurbish our existing reentry systems and develop new reentry systems in response to USSTRATCOM requirements. As the threat environment the nuclear enterprise faces continues to evolve, it is critical that the Navy designs, develops, and deploys programs that meet the needs of the Warfighter. The TRIDENT II D5 missile is capable of carrying two types of warhead families today, the W76 and the W88. The W93/Mk7 warhead will be designed for use on both the D5LE and D5LE2 missiles and, through the Polaris Sales Agreement and Mutual Defense Agreement, will support the United Kingdom's sovereign Replacement Warhead program. In 2019, NNSA completed the W76-1 Life Extension Program (W76-1/Mk4A), marking the U.S. stockpile's first full-scale warhead refurbishment program. The Navy continues to work on modernizing integrated aeroshells that house these warheads through the Mk4B program with the inclusion of a Shape Stable Nose Tip, which reduces reentry variability and improves performance margins.

The W88/Mk5 warhead continues to undergo its refurbishment program (ALT370) on a revised timeline based on capacitor component issues that did not meet reliability requirements. The Navy and NNSA coordinated on tightly coupled schedules for the fleet, the nuclear enterprise

weapons complex, and production of affected non-nuclear components to execute an 18-month delay to the original schedule that was approved by the Nuclear Weapons Council (NWC). This program reached the First Production Unit milestone on schedule in 2021 and achieved Initial Operational Capability in January 2022. I am confident that our teams will continue to work together to manage and deliver this program, as we have historically addressed refurbishment challenges with a mission-focused attitude and rigor. The Navy will continue to prioritize meeting our Warfighters' requirements and minimizing disruption to the operational fleet to ensure that the sea-based leg of the triad continues to fulfill its deterrence mission. However, the setback this program faced is indicative of the pervasive and overwhelming risk carried within the nuclear enterprise as refurbishment programs face capacity, historical funding, and schedule challenges.

In 2021, the Navy entered Phase 1 of the joint DoD-DOE Nuclear Weapons Lifecycle Process with NNSA for the W93/Mk7. This effort will address evolving ballistic missile warhead modernization requirements; improve operational effectiveness for USSTRATCOM; and mitigate technical, operational, and programmatic risk in the sea-based leg of the nuclear triad while simultaneously reinvigorating the atrophied industrial base and modernizing a Cold War era stockpile. W93/Mk7 will provide flexibility and adaptability to meet future warfighter needs. With the near simultaneous age out of the deployed stockpile in the 2040s, the W93/Mk7 will help address production concerns in the weapons complex and ensure an uninterrupted at-sea deterrent for the sea-based leg of the nuclear triad. In FY22, the W93/Mk7 program received NWC authorization to proceed into Phase 2, Feasibility Study and Design Options, which will further refine and mature the design of the W93/Mk7 program in a manner that provides an affordable, credible, safe, and secure weapon to the Warfighter. Even with the addition of the W93/Mk7 to the stockpile, we will not increase the deployed stockpile. The Navy will work in close coordination with DoD, NNSA, the NWC, and the Congress as this effort matures, but we cannot continue to life extend our leftover Cold War era weapons and systems and successfully carry out our national strategy.

Industrial Base and Infrastructure

To borrow again from ADM Richard's remarks, "maintaining and strengthening deterrence for the long term requires a modern infrastructure and industrial base able to develop credible capabilities necessary for a more challenging security environment." The nation requires a fully modernized nuclear force and supporting infrastructure to execute our national strategy. Our modernization needs cannot succeed without investing in the research and development (R&D), critical skills, and facilities needed to produce, sustain, and certify our nuclear systems. Ensuring robust defense and aerospace industrial base capabilities—such as radiation-hardened electronics, strategic inertial instrumentation, and solid rocket motors—remains an important priority in conjunction with R&D investment. SSP has placed particular emphasis on the solid rocket motor industry and its sub-tier suppliers and appreciates the support of the Congress to allow for the continuous production of these vital components. Essential to the nuclear deterrent is a national aeroshell production capability. The Navy has not delivered an integrated aeroshell since the 1980s and needs to reinvigorate a production capability that only resides in a small cadre of highly skilled experts in an exceptionally niche industry. Aeroshell investment supports the Navy but will also be cost-effectively leveraged by our colleagues in the Air Force – and also our strategic partners in the United Kingdom as they pursue their independent reentry program endeavors. Finally, R&D investment is critical to today's nuclear modernization needs to ensure that we advance necessary technology ahead of design needs and to train our workforce during the early years of development. If the nation does not continue to address these concerns, no amount of money will be able to adequately mitigate the risks associated with key stockpile and infrastructure losses.

From an infrastructure perspective, our program is entering unprecedented times. Existing facilities are reaching their 30-year recapitalization windows while we simultaneously face weapons systems modernization periods in order to meet future requirements. Investing in facility sustainment and modernization is required for cradle-to-grave operations. Appropriate Military Construction and Facility Sustainment, Restoration, and Modernization resourcing is critical to the Navy maintaining a credible deterrence posture to include providing more than 70 percent of the Nation's operationally deployed nuclear warheads. We will make smart investments to address through-put constraints and build in surge capacity to address requirements presented by new and emerging threats. The Navy relies on a limited footprint to

process missiles and outfit the SSBNs. Maintaining and sustaining facilities is critical to meeting USSTRATCOM and Fleet mission requirements. Our nation, and the Navy, will continue to prioritize and resource the sustainment and modernization of its nuclear infrastructure enterprise to provide an effective and flexible deterrent now and into the future.

As the Navy executes the modernization and replacement of the SSBN and associated SLBM leg of the nuclear triad, DoD and NNSA's infrastructure must be prepared to respond in tandem to the evolving needs of the Nation. Of most importance, we must have an effective, resilient, and responsive plutonium pit production capability. This capability can address age-related risks, support planned refurbishments, as well as prepare for future uncertainty. Additionally, tritium, lithium, and uranium, and high explosives and energetics, among other strategic materials, are vital to ensuring the Navy can continue to meet its strategic deterrent requirements. Efforts to sustain and modernize deterrent forces must continue. Our strategic forces underpin every military operation around the world, and we cannot afford to delay given the increasing threats facing our nation.

Workforce

History reminds us that the swift, successful creation and execution of the Fleet Ballistic Missile program in the 1950s was truly a result of national commitment, congressional support, and a cadre of hand-selected scientists, engineers, and inspirational leaders. Though process will always underpin our efforts, our dedicated predecessors—civilians, military, and industry partners alike—responded to the national need with focused determination and drove this program with a vision. People are as fundamental to our nuclear deterrent as the SWS itself. Today, SSP and its industry partners are focused on inspiring, growing, and retaining a generation of workforce that did not live through the darkest days of the Cold War. Connecting a new workforce to this fundamental global security mission remains an important task shared among the entire nuclear enterprise. A capable, credible, and affordable strategic deterrent for our Nation for the next 60 years requires not only technical, policy, management, and financial acumen—it requires passion and a commitment to making this our life's work.

SSP has made significant strides in recent years to honor our past, innovate our present, and ensure our future workforce is connected to the fundamental global security mission. In order to create the ideal workforce and workplace, SSP developed the SSP Human Capital Operating Plan (HCOP) in FY19. The HCOP is a five-year plan aligning human capital initiatives to SSP's strategic goals. SSP is now in the fourth year of the HCOP execution and is realizing valuable change from these efforts. The five goals and associated successes are outlined below.

Goal 1 – Recruitment and Retention: create and implement effective strategies to recruit and retain highly qualified candidates and employees, internal and external, sufficient to ensure that SSP fulfills its mission requirements. Accomplishments toward this end include: developing a comprehensive Talent Pipeline Strategy; Standardizing SSP-enterprise Exit & Stay Interview processes; Established Human Resources (HR) Data Analytics position and integrated efforts across HR functions;

Goal 2 – Talent Development and Sustainment: support, develop, and strengthen the workforce to continually evolve and successfully execute the mission. Accomplishments toward this end include: developing Science & Technology Subject Matter Expert career tracks; conducting a staffing study to assess current and future competencies and capacities; implementing robust mentorship programs; Established Career Development Counseling Program; and Developing an SSP Academy.

Goal 3 – Leadership Development: strengthen enterprise leadership at all levels through robust leadership development programs and clear assignment and execution of authority, accountability, and responsibility. Accomplishments toward this end include: Implementing robust coaching programs for leaders and developmental employees; delivering supervisory training for hybrid work environments; continuously promoting internal leadership programs; and Developing an HR Management for Supervisors course

Goal 4 – Culture: clearly define and communicate SSP culture and values. Reinforce and assess the organizational culture as necessary for continuous improvement at every level. Accomplishments toward this end include: Developing an improved employee recognition and awards process; delivering on-going health and wellness activities; establishing a 'We Heard

You’ campaign to communicate SSP’s responses to feedback; defining SSP Culture and Values (Director’s Intent) and developing SSP Culture Videos.

Goal 5 – Diversity and Inclusion: create and implement effective strategies to cultivate a diverse and inclusive work environment that promotes employee engagement and the exchange of different ideas, philosophies, and perspectives. Accomplishments toward this end include: Conducting barrier analysis; establishing Diversity and Inclusion Council; increasing use of Individuals with Disabilities Recruitment Program; and connecting a Leadership Learning Series with Special Emphasis Program.

Polaris Sales Agreement: Support to the UK

Development of the future SWS not only addresses known U.S. risks, it also supports the UK’s critical need to recapitalize its deterrent and, given the UK deterrent’s contribution and commitment to NATO, this recapitalization is essential to our NATO partners’ overall defense posture. A critical component of the *Columbia*-Class Program is the procurement of a Common Missile Compartment (CMC) with the UK under the auspices of the Polaris Sales Agreement. Our partnership with the UK supports production of the CMC in both U.S. and UK build yards. Ensuring that the *Columbia*-Class program remains on schedule supports not only our Nation’s operational requirements, but also the ability of the UK, one of our most important allies, to maintain its Continuous-at-Sea Deterrent. Similar to the U.S. Navy, the Royal Navy is recapitalizing its four aging *Vanguard* Class ballistic missile submarines with the *Dreadnought* Class SSBN. The CMC will support today’s TRIDENT II D5 SWS, which the U.S. Navy sells to the Royal Navy for deployment aboard its *Vanguard*-Class SSBNs, and that will be deployed as the initial loadout on both *Columbia* and the UK *Dreadnought*-Class SSBNs. For decades, U.S. policy has recognized that the independent UK nuclear deterrent adds to joint efforts to deter aggression and attack against NATO and thereby positively contributes to global stability. Under the 1958 Mutual Defense Agreement and the 1963 Polaris Sales Agreement, the United States Navy has provided decades of support and material, consistent with international law, to the UK deterrent program. Without this assistance, the cost and schedule risk to maintain the UK’s independent deterrent would rise significantly, thus creating additional challenges for the UK in sustaining its nuclear contribution to NATO alongside the United States.

Conclusion

Our Nation's sea-based strategic deterrent has been a critical component of our national security since the 1950s and must continue to assure our allies and partners and to deter potential adversaries well into the future. SSP ensures a safe, secure, effective, flexible, and tailorable strategic deterrent, with a steadfast focus on the proper stewardship, custody, and accountability of the nuclear assets entrusted to the Navy. Sustaining and modernizing the sea-based strategic deterrent capability is a vital national security requirement. I am privileged to represent this unique organization as we work to serve the best interests of our great Nation. I thank the committee for the opportunity to speak with you about the sea-based leg of the nuclear triad and the vital role it plays in our national and global security.

Vice Admiral Johnny R. Wolfe, Jr.
Director, Strategic Systems Programs

Vice Adm. Johnny Wolfe is a native of Somerset, Texas. He graduated from the U.S. Merchant Marine Academy, Kings Point, New York, in 1988 with a Bachelor of Science in Marine Systems Engineering. He earned a Master of Science in Applied Physics from the Naval Postgraduate School in 1994, where he was also selected for transfer to the engineering duty officer community.

At sea and on deployment, he served as the assistant weapons officer on USS Lewis and Clark (SSBN 644) from 1988 to 1992, and was part of a forward-based team that led the rebuilding of courthouses and prisons in Iraq in 2007. In 1994 he was assigned as the lead systems engineer on a Ballistic Missile Defense Office (BMDO) joint skunkworks project ran by the U.S. Air Force at Kirtland Air Force Base, New Mexico.

From 1995 to 1996, he was assigned to Strategic Systems Programs (SSP) as the liaison to the Deputy Assistant Secretary of the Navy Command Control Communications Computers & Intelligence (C4I). From 1996 to 2000, he served as the assistant section head for fire control and guidance at SSP. In July 2000, Wolfe was assigned to the Program Management Office, Strategic Systems Programs (PMOSSP), Sunnyvale, California, where he served as the technical division head. During this tour, he was assigned additional temporary duties as a technical investigator for the Columbia Accident Investigation Board where he served as a lead for foam loss testing and orbit impact analysis. From 2003 to 2014, Wolfe was assigned back to SSP Headquarters. While at SSP he served in many positions, including the deputy chief engineer, branch head for Fire Control and Guidance Branch, the nuclear weapons security coordinator and SSGN coordinator, and branch head for Missile Branch.

In 2012, Wolfe assumed duties as the technical director and deputy director reporting program manager for Strategic Systems Programs. Wolfe was promoted to Rear Admiral October 1, 2014, and assigned as the program executive for Aegis Ballistic Missile Defense, Missile Defense Agency.

Wolfe was promoted to Vice Admiral on May 4, 2018 and assumed the duties as director, Strategic Systems Programs.

Wolfe's awards include the Defense Superior Service Medal, Legion of Merit, Bronze Star, Meritorious Service Medal with gold star, Joint Services Commendation Medal, Navy Commendation Medal with gold star, Navy Achievement Medal with three gold stars, Air Force Achievement Medal and various other service awards.

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SUBCOMMITTEE

STATEMENT
OF
LIEUTENANT GENERAL JAMES C. DAWKINS, JR., USAF
DEPUTY CHIEF OF STAFF FOR STRATEGIC DETERRENCE & NUCLEAR INTEGRATION
BEFORE THE
SUBCOMMITTEE ON STRATEGIC FORCES
OF THE
HOUSE ARMED SERVICES COMMITTEE
ON
FY23 NUCLEAR FORCES
MAY 17, 2022

INTRODUCTION

Thank you for the opportunity to testify before the committee on the current status and future prospects of the Air Force's nuclear programs and policies. I would also like to highlight and thank our critical industry and government partners who work to seamlessly integrate monumental modernization and maintenance efforts across the U.S. nuclear enterprise. Finally, a special thank you to the Airmen who work tirelessly day in and day out to ensure the U.S. retains the safe, secure, reliable, and credible nuclear deterrent our Nation demands. Their ceaseless and often unheralded efforts to operate, maintain, and protect our systems ensures the credibility of the U.S. nuclear deterrent. I am proud to testify that due to their efforts, our Nation's bomber, Intercontinental Ballistic Missile (ICBM), and airborne Nuclear Command, Control, and Communications (NC3) forces maintained high standards for nuclear readiness despite the continued impacts of the COVID-19 pandemic. Their unwavering professionalism continues to ensure the foundation of our national security remains strong, but we must provide them the right tools and capabilities to face the pacing challenges posed by Russia and China.

After decades of underwriting global stability and security, the Department of the Air Force (DAF) is at an inflection point for providing a credible strategic deterrence capability in an evolving nuclear-armed, adversarial strategic environment. The DAF's core missions of protecting Americans and American interests, assuring our allies and partners, and deterring our adversaries have not changed in the past decade; however, the domains, technology, and threats have. Failure to adapt to a changing world is not an option; every operational plan and capability in the Department of Defense (DoD) rests on the foundation of strategic nuclear deterrence. The stakes could not be higher.

As I testified last year, the DAF continues to achieve many key nuclear goals including significant milestones in the LGM-35A Sentinel weapon system, Long Range Standoff missile (LRSO), B-21 Raider, the B61-12, and our NC3 programs. Sentinel is the next generation Intercontinental Ballistic Missile (ICBM) that brings critical safety, security, and reliability features to replace the aged Minuteman III (MM III) system and a majority of its infrastructure. MM III is over forty years past its design life and will not be viable against future threats. Sentinel continues to be a model acquisition program and has achieved great success in the Engineering and Manufacturing Development (EMD) phase. Sentinel's acquisition ensures we maintain pace with our competitors and continue to deter the evolving threats posed by Russia, the People's Republic of China (PRC), the Democratic People's Republic of Korea (DPRK), and Iran. The Air Force also achieved great successes with the LRSO program, to include a test flight in March, which will replace the Air Launched Cruise Missile (ALCM) fielded in 1982. The LRSO's capabilities are critical to deterrence, as they will complicate the adversary's defense calculus by improving survivability and standoff range, while serving as the primary hedge for the ground and sea legs of the triad. Finally, the B-21 Raider program remains on schedule and on budget, with the first six aircraft in production.

It is vital that these recapitalization programs remain on schedule for the DAF to continue performing its critical deterrence mission. Time is not a recoverable asset and we need to make the most of every moment. Our strategic competitors and pacing challenges present the most technologically advanced military capabilities the U.S. has ever faced. Yet, we are equipping our Airmen with systems that are decades past their lifespans and were developed for a strategic environment that is very different than today's. The emerging security environment demands we modernize.

THE THREAT

America's post-Cold War military experience of freely operating in uncontested domains is over. For the first time in our Nation's history, we are facing two nuclear-armed, strategic competitors: Russia and the PRC. Over the past 30 years, while the U.S. focused on counterterrorism in the Middle-East, our strategic competitors took advantage of America's inattention to grow their conventional and nuclear capabilities and update their tactics to integrate nuclear warfare options into the broader spectrum of conflict. Russia and the PRC have built formidable and advanced defensive systems, are bolstering offensive and defensive capabilities in space and are rapidly developing the next generation of technologies in autonomously operated weapons, precision missiles, artificial intelligence and hypersonic flight.

Russia's willingness to attack Ukraine shattered the relatively peaceful decades enjoyed in Europe. Our NATO and European allies and partners faced the stark reality that Russia will expand their influence through force and their direct and indirect threats to use nuclear weapons is alarming. Assurance to our European allies and partners is as critical now as it was during the Cold War. Russia continues to modernize both its nuclear and conventional forces and is leading the world in the development and deployment of hypersonic weapons. Russia has not only modernized every leg of its triad, but is expanding its nuclear stockpile to include novel strategic systems. Russia has multiple types of non-strategic nuclear weapons (NSNW) deployed or in research and development, including, short- and close-range ballistic missiles, cruise missiles, and anti-ship missiles. Several of Russia's novel strategic systems—the Poseidon nuclear-powered, strategic-range torpedo; and the Burevestnik nuclear-powered, strategic-range cruise missile—and its NSNW are not subject to New START Treaty's limits or verification regime.

The PRC represents the largest long-term threat to the U.S. as it rapidly increases its offensive and defensive warfighting capabilities to specifically defeat our power projection in the Pacific. China is growing their nuclear arsenal to at least a thousand warheads by 2030, modernizing and expanding its delivery systems, and building a survivable nuclear triad. In addition to the land- and sea-based capabilities, the PRC announced its new nuclear-capable strategic stealth bomber, which analysts assess will be operational by the end of this decade. The increases in capability, combined with improvements in the readiness of its nuclear and C2 forces and its advancement of the airborne leg of its triad, will significantly increase the responsiveness, survivability, and lethality of the PRC's nuclear deterrent. The PRC's nuclear breakout is deeply concerning. These capabilities will embolden Chinese leaders to leverage their nuclear forces to achieve Chinese political objectives, such as coercing other states—including U.S. allies—or threatening U.S. assets and interests across Asia and the Pacific. Additionally, China continues to develop other advanced weapons, to include their hypersonic glide vehicle that showcased global range. The PRC is not constrained by any arms control agreements and none are expected to be negotiated anytime in the near future.

Meanwhile, DPRK and Iran are also pursuing destabilizing capabilities and technologies. DPRK continues its ballistic and hypersonic missile development and testing, threatening regional stability in the Pacific. It is also working to add rail-mobile and sea-launched missile capabilities that complicate our ability to find, fix, track, and target their missiles. Iran's posturing and refusal to negotiate on international nuclear agreements shows their willingness to continue pursuing nuclear weapon and ballistic missile technology.

Competitor or ally, all nuclear-armed countries are working on or have already invested heavily in modernization, expansion, and development of their nuclear forces. The U.S. must continue to

shepherd its resources and focus on its nuclear forces to ensure we do not fall behind or allow our deterrent force to be overshadowed by the emerging capabilities of strategic competitors. Furthermore, modernized capabilities from competitors could encourage allies to look elsewhere for strategic assurance.

STRATEGY & THE NUCLEAR TRIAD

Bolstered by the strength of our U.S. Navy and the Department of Energy's (DOE) National Nuclear Security Administration (NNSA) partners, the triad and the NC3 enterprise has served as cornerstone of U.S. defense strategy for decades. The triad, two-thirds of which the DAF operates, brings together the capabilities of the bomber, ICBM, and the Navy's submarine-launched ballistic missile (SLBM) forces. With foreign nuclear threats growing, the importance of the triad is more important today than ever. Each leg provides unique and complementary attributes, complicates adversary planning, and ensures no country could launch a strategic attack that eliminates our nuclear forces or our Nation's ability to respond. The triad's diversity enables risk mitigation if a particular leg of the triad is degraded or unavailable due to unforeseen technological issues, operational vulnerabilities, or technological breakthrough by a competitor. The certainty of our weapons ensures no adversary would dare risk the catastrophic consequences of a nuclear strike against our homeland.

The triad is also a key part of our allies' defense strategy through U.S. extended deterrence commitments. Our allies and partners watch what we say and do as much as our strategic competitors do. The U.S. does not only deter potential adversaries from aggression against the homeland; extended deterrence assures our allies and discourages nuclear proliferation by increasing allies' and competitors' confidence about the integrity of U.S. security commitments. The North Atlantic Treaty Organization (NATO) alliance has provided for the common security of our European allies since 1949 and Air Force and NATO dual-capable aircraft are integral to NATO's overall deterrence and defense posture. In the Indo-Pacific, U.S. nuclear capabilities play a vital role in maintaining peace, stability, and non-proliferation goals.

REQUIREMENTS, MODERNIZATION, AND RECAPITALIZATION

U.S. nuclear deterrence and extended deterrence relies on the Air Force's execution of daily deterrent operations and other states' perceptions of our capability. The credibility of our nuclear deterrent is degraded if our weapons and delivery systems are unreliable or inaccurate, or if training is inadequate. Furthermore, U.S. investments in conventional, space, and cyberspace capabilities can all be negated if an adversary perceives a nuclear advantage over the U.S. and escalates a conflict in an effort to gain that perceived advantage.

Schedule and programmatic uncertainties increase operational risks. For far too long, we have deferred our Nation's nuclear modernization and cannot do so any longer. As a result, the DAF is simultaneously recapitalizing its bomber fleet, ICBM force, air-launched missiles, and NC3 systems. These modernizations are already late to need and have little to zero schedule margin. It is not a choice between replacing these platforms and keeping them. It has become a choice between replacing them or losing them entirely. This once in a lifetime recapitalization of critical next generation capabilities must remain a top priority as we concurrently look to divest those aging and legacy systems that are not effective against the pacing challenges.

The DAF continues to maintain a strong, mutually supportive partnership with the NNSA to ensure our modernization and recapitalization programs remain on time and on budget. It is critical that each

of these programs deliver on schedule to reduce the risk of capability gaps near the end of this decade and into the next. To that end, the NDAA passed by Congress this past December enhances our nuclear deterrent by reiterating bipartisan support for our nuclear forces as the cornerstone of our national defense, and emphasizing the importance of the LGM-35A Sentinel weapon system. The Fiscal Year (FY) 2023 President's Budget request also greatly supports the modernization of the Air Force's Global Strike capability by ensuring continued investment in our major recapitalization programs, including the B-21, Sentinel, LRSO, and the MH-139 helicopter, while also continuing critical sustainment efforts for our current nuclear forces and support components.

GROUND LEG - INTERCONTINENTAL BALLISTIC MISSILES

The ICBM force is the most responsive leg of the triad, staying on day-to-day alert 24/7/365. ICBMs deter strategic attack on the homeland while greatly complicating the targeting calculus of any potential adversary. Through the combination of accuracy and rapid response, an adversary must consider our ICBM force in any decision involving their use of nuclear weapons. Additionally, the quantity and dispersion of the ICBM force make it a nearly insurmountable targeting problem. Without ICBMs, an adversary could calculate a more favorable outcome for an attack against the U.S. homeland. For example, without ICBMs, a conventional-only attack on our limited number of submarine and bomber bases could significantly degrade the U.S. nuclear capability.

Minuteman III: The MM III remains an indispensable part of the nuclear triad. However, the Air Force can no longer cost-effectively sustain it and emerging threats will reduce its future effectiveness. The Air Force deployed the first MM III missile in 1970 into launch facilities built in the 1960s. The MM III weapon system is now more than forty years beyond its designed service life and requires at least twenty significant modernization and sustainment programs to keep it viable until replaced by Sentinel beginning in FY29. The Air Force continues to work across multiple lines of effort to ensure the legacy ICBM force remains safe, secure, and effective during the concurrent operations supporting the transition to Sentinel and until its retirement.

Nuclear weapons must be as good on their last day as they are on their first—anything less is unacceptable; however, the MM III sustainment efforts cannot change the reality that this legacy platform will not be able to close capability gaps or evolve to meet future strategic requirements. The MM III's design and technology are over 56 years old. The ability to upgrade and adapt to change is prohibitively costly and significantly design constrained. The high costs and design constraints are compounded by the system's on-going asset attrition and obsolescence, with many vendors, technologies, and parts no longer in existence. These sustainment and attrition issues drive difficult trade-offs between operational maintenance requirements, which are also limited by legacy design architecture constraints, and the associated development and procurement costs. These compounding problems create exponential and prohibitive costs. This reality is reflected in several comprehensive reports and studies that have been conducted by the DAF, DoD, Congress, and academia over the past eight years that have all concluded that MM III life extension is not the most viable or even cost-effective solution.

LGM-35A Sentinel Weapon System: The DAF fully committed to replacing the entire MM III system with the LGM-35A Sentinel weapon system. Sentinel addresses ICBM capability and attribute gaps for accuracy, probability-to-penetrate, range and payload, targeting flexibility, nuclear safety, and physical and cyber security. Additionally, the development of a newer, more capable ICBM weapon system provides an opportunity to reduce the total cost of ownership by increasing system reliability and adopting specific design features focused on increasing maintainability. In

addition, the implementation of a modular open system architecture, coupled with the Air Force's ownership of the technical baseline, greatly enhances the weapon system's ability to adapt to future emerging threats and sustainment modifications. For the past seven years, Sentinel has met every major milestone and is currently in the EMD phase, which includes weapon system design, qualification, test, evaluation, and nuclear certification. In FY23 the DAF is investing \$4.1 billion dollars into the Sentinel program, which allows further maturation of critical weapon system technologies and software and continued development of Vandenberg SFB test capabilities and infrastructure. Sentinel takes our ICBM force into the modern era, addresses the challenges of sustaining and securing this strategic capability, and allows us the opportunity to evolve tactics, techniques, procedures, and operator culture.

As a critical national security priority, continued, consistent, and predictable funding remains essential to ensure the on-time delivery of the Sentinel weapon system. Sentinel's unique use of digital engineering, modularity, and modular open system architecture, along with government ownership of data rights, allow it to remain viable against emerging threats and more easily integrate future NC3 systems. Increases in safety, security, reliability, and cyber resiliency have been incorporated since the start. New C2 systems maximize modularity, which streamlines future upgrades, increases maintainability, and boosts flexibility while maintaining responsiveness, and potentially reducing manpower requirement by 35%. Sentinel also allows a two-thirds reduction in the number of security and maintenance convoys, further bolstering security, reliability, and cost-savings. Sentinel's modular design improves maintainability by reducing component replacement requirements through line-replaceable and upgradable hardware. New flight systems significantly increase reliability and reduce guidance system failure by up to 60%. The incorporation of enhanced diagnostics such as fault detection, isolation, and prediction enables performance prediction, big data analytics, logistics data collection, and supply chain integration to lower life cycle costs. The fielding and stewardship of Sentinel provides a critical national security capability in a responsible, balanced way that enhances fiduciary efficiency.

The Sentinel program will begin fielding in 2027 to meet full operational capability (FOC) in 2036. The system will utilize the W87 and Mk21 until the W87-1 and Mk21A are fielded. It is critical for Sentinel to remain on this timeline in order to successfully transition from the MM III while continuing to meet ICBM on-alert requirements of the United States Strategic Command.

AIR LEG – BOMBERS AND ASSOCIATED NUCLEAR WEAPONS

Consisting of nuclear capable bombers and their associated standoff and gravity weapons, the air leg is a clear and visible signal of U.S. intent and resolve during a crisis and provides a flexible and tailored response through a variety of deployment and employment options. Today, these include the B-52 with ALCM and the B-2 with their load-out of B61. In the very near future, we will add the B-21 and the LRSO to the inventory, as well as the B61-12, which completed the first production unit of its Life Extension Program in November of 2021. Our bomber force is capable of employing the full range of combat power across the entire spectrum of conflict, giving Combatant Commanders the flexibility and necessary reach to strike, if deterrence fails. To accomplish this, the air leg requires both stand-off (i.e. LRSO) and stand-in (e.g. B-21 bombers with gravity weapons) capabilities—these are not interchangeable.

As the most flexible and visible leg of our triad, our bombers provide two critical features for our nuclear force: signaling capability and recallable forces. The generation of bomber forces from their day-to-day operations to nuclear operations takes time and is deliberately visible to enemies and allies

alike. This generation can communicate our intent and potentially prevent a conflict before it starts by allowing time to off-ramp before nuclear use. Bomber forces also enable global reach through their deployment around the world. This can provide critical signaling to enemies and allies in peacetime and allow for prompt response if deployed. While the nuclear mission of the bomber force is critical, the capabilities bombers bring to conventional operational plans are no less important. This is especially true given the USAF is not only our Nation's only bomber force, but also our Allies' only bomber force.

The B-2 bomber serves our country well and will do so until it is replaced by the B-21. The B-2 remains the only penetrating bomber able to hold any target in the world at risk, but requires communications upgrades and integration of the nuclear B61-12 gravity weapon in order to remain relevant to the fight. The B-2's replacement, the B-21, will carry this legacy of long-range strike forward; it is currently executing in the EMD phase and the Air Force is closely monitoring the production of the first six aircraft.

Investments in the B-21 and modernization of the B-52 ensures the U.S. maintains the capability to deter aggression, assure allies, and project combat power across the full spectrum of conflict. The B-52 is executing the most comprehensive modernization in its history, to include commercial engine replacement and modernization of its radios and radars, all of which remain on track. These modernization programs ensure the B-52 remains relevant through the 2050s. With a future two-bomber fleet of B-21s and modernized B-52s, the ability to reach any potential target, anytime, anywhere in the world remains intact.

The current stand-off missile, the ALCM, is operating 30 years past its design life and has significant capability gaps that will only worsen through the next decade. As we face the modern defensive capabilities of our strategic competitors, the need for a stand-off capability makes LRSO essential. The LRSO provides the most survivable and sustainable weapon for our bomber force; holding high value targets at risk in a rapidly evolving threat environment. The bomber force's capability of launching multiple LRSO weapons at once complicates adversary defenses by creating a high number of targets that air defenses must find, fix, track, target and engage simultaneously from multiple vectors of attack, thereby increasing deterrence. When they come online, the combination of the stealth B-21 and LRSO can engage targets deep in an adversary's territory that cannot be effectively addressed by ballistic missile systems, denying an adversary any geographic sanctuary. LRSO's unique characteristics augment the capabilities of nuclear gravity bombs, providing more flexible response options and increasing the effectiveness of our bombers and nuclear deterrent.

The LRSO program represents the first simultaneous integrated nuclear program that the DoD and NNSA have executed since the 1980s. The LRSO program is on track to meet its planned initial operating capability (IOC) and has been moving smoothly forward since the EMD contract was awarded in July 2021. Its successful test flight this past March was an incredible step forward. The Air Force plans to invest \$981M in FY23 for the continued design and development of the LRSO. As the nuclear hedge for unforeseen issues in the Sentinel and COLUMBIA SSBN programs, it is more critical than ever that the LRSO program remains funded and on schedule.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS (NC3)

The DAF operates and maintains approximately seventy-five percent of all NC3 capabilities, which is a critical system-of-systems that ensures the President and senior leaders have the ability to detect nuclear attacks, decide on a response, and direct nuclear forces. Today, many NC3 systems

are a legacy of the Cold War and the DAF continues to invest heavily in order to modernize, sustain, and protect interconnected NC3 elements as new threats emerge in multiple warfighting domains, particularly those threats in the cyber and space domains. To address these threats, we must continue to adapt our NC3 architecture and capabilities. We are working closely with the Department of Defense to ensure that NC3 is integrated into the Joint All Domain Command and Control (JADC2) by linking it with the DAF's Advanced Battle Management System (ABMS). The Joint Force must leverage capabilities, such as next-generation sensors and decision support provided by our ABMS investments to acquire, and if necessary, prosecute targets. The DAF has ensured that, where practical, Next Generation NC3 capabilities will utilize ABMS solutions to adapt a modern NC3 architecture.

Weapon system modernization is underway across the entire set of NC3 capabilities. In FY23, the USAF plans to invest approximately \$689M in NC3 programs, including the Family of Beyond Line-of-Sight-Terminal Force Element Terminal (FAB-T FET), Global Aircrew Strategic Network Terminal (GASNT) Increment 1, and several other programs to ensure the reliable force direction of the Air Force's nuclear forces. The President's Fiscal Year (FY) 2023 budget request for the Space Force initiates a necessary transformation, beginning with fielding a resilient missile warning and tracking architecture to detect and maintain custody of emergent hypersonic and maneuverable missile technologies, while making survivability under attack a key attribute of the design. The Department is heavily investing in FY23, requesting \$1.029 billion for this mission area.

Additionally, we continue to invest in the Survivable Air Operations Center (SAOC) as the aging E-4B National Air Operations Center (NAOC) replacement. The SAOC ensures national leadership a highly survivable NC3 platform in the event ground command and control, and associated centers are at risk or cease to function during national emergencies. The Air Force is finalizing the SAOC program acquisition strategy, targeting approval in mid- to late-FY22 and remain on target to deliver aircraft for this critical NC3 mission in the 2030s. The DAF will continue to provide reliable and resilient NC3 capabilities across a broad range of frequencies, from missile warning to force direction

INFRASTRUCTURE & WEAPONS GENERATION FACILITIES (WGFs)

The modernization of the bomber and ICBM weapons systems remains critical to the nuclear enterprise; however, the modernization of the supporting infrastructure is also required for the continued success of the mission. Like the rest of the enterprise, these facilities are relics of the Cold War and their sustainment needs have reached the point where this aging infrastructure is impacting the ability of our Airmen to support the Air Force's nuclear mission. The DAF is already working to rectify this by recapitalizing the decades-old Weapon Storage Areas (WSAs) as Weapons Generation Facilities (WGFs). The WGF will consolidate weapon maintenance, storage, and training functions required to support the ICBM and bomber missions into a single, modernized, secure facility. WGFs support rapid generation of nuclear aircraft and routine maintenance operations for the ground-based and air legs of the triad, improving weapons generation, maintenance, and storage operations, thus resulting in a more secure facility and efficient processes. These facilities will be the backbone for the generation of Air Force combat power and bolstering deterrence. The Air Force is designing all WGFs fundamentally alike in their respective mission areas (bomber/ICBM), providing semi-hardened facilities to support generation, maintenance, and storage functions for nuclear weapons.

The Air Force has made significant progress on evaluating requirements to account for modern weapon designs, driving costs down to ensure WGF affordability. The first WGF is under construction at F.E. Warren Air Force Base (AFB) in support of the ICBM mission and is estimated

to be completed next year and a 2025 IOC. The lessons learned from the F.E. Warren WGF is driving the design review for the WGF anticipated at Malmstrom AFB in support of the ICBMs; the DAF anticipates a construction award for the Malmstrom WGF in FY23. To support the bomber and LRSO force, the DAF will use FY22 enacted appropriations for the construction of the WGF at Barksdale AFB—which will combine existing facilities with new construction—and will submit a future budget request to begin planning for a WGF at Ellsworth AFB, as discussed with the Senate Appropriations Committee during the FY22 MILCON Budget hearing. Finally, the DAF is planning on WGFs at Minot AFB and Whiteman AFB to support both the ICBM and bomber mission and are expected in the 2030s.

DIGITAL ACQUISITION STRATEGY

While we are proud of these programs' progress, the DAF recognizes the need to Accelerate Change. Specifically, we are pivoting toward digital engineering, agile software development, and open digital architectures when developing each future program in order to reduce cost and cut the time between concept and solution. We have the capability to transform weapon system acquisition: computing power has increased by 10,000 times since 2000 and there has been exponential growth in the ability to collect, store, and analyze data to identify trends, i.e. "Big Data". The DAF is also paving the way for the novel concept of owning the technical baseline and creating an architectural framework to share with the warfighter. Another revolutionary concept we are pursuing is the computerization and virtualization of development and production, assembly, and even sustainment of systems. This unique use of technology will cut real-world testing times by validating digital models and make future upgrades and modifications faster and easier by bringing lessons learned and feedback from Airmen into the digital sphere. Aircraft, weapons, and other critical systems will prove their capability and worth in a digital reality before physical prototyping is even begun.

CONCLUSION

The DAF is actively working to adapt to new domains, new competitors, changing technologies, and an emerging security environment. To ensure and protect the American way of life, we must honor our commitments to our allies, while unequivocally and consistently communicating our resolve to our strategic competitors and pacing challenges; we must deter across every domain, every day. Our strategic deterrent enables all elements of our national power; we must continue to innovate, develop, acquire, field, and sustain our nuclear systems to abolish any doubt in our capabilities by either friend or foe.

The U.S. nuclear triad remains the primary military means by which the DoD provides deterrence against existential threats to our way of life, our homeland, and our allies. Failing to prioritize our modernization and recapitalization efforts for nuclear and conventional systems would result in retaining systems that are no longer capable of deterring our peer competitors and would amount to ceding power and influence to forces that could threaten the United States and its allies, friends, and interests. The only way to deter our strategic competitors, assure our allies, and defend our interests is to field an unquestionably credible force so that no potential adversary will dare to risk the fight. We can maintain deterrence by investing, modernizing, and recapitalizing smartly and quickly. The nuclear enterprise is on the correct path but we must remain diligent by providing stable requirements and consistent funding. The DAF is committed to providing stable requirements and continued funding for its current, and future, nuclear programs and capabilities across the enterprise. However, we cannot do this alone, and we ask for the continued support of Congress to provide the required authorizations and appropriations across both the DoD and NNSA enterprises to ensure deterrence of war on behalf of the Nation, its interests, and its allies.

Lieutenant General James C. Dawkins Jr.

Lt. Gen. James Dawkins Jr. is Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, the Pentagon, Arlington, Virginia. The general is responsible to the Secretary and Chief of Staff of the Air Force for focus on Nuclear Deterrence Operations. He provides direction, guidance, integration and advocacy regarding the nuclear deterrence mission of the U.S. Air Force and engages with joint and interagency partners for nuclear enterprise solutions.

Lt. Gen. Dawkins was commissioned in 1989. He has held a variety of operational and staff assignments, including command of Eighth Air Force at Barksdale Air Force Base, Louisiana; the 5th Bomb Wing at Minot AFB, North Dakota; the 509th Operations Group at Whiteman AFB, Missouri; and the 338th Combat Training Squadron, an intelligence, surveillance and reconnaissance training squadron at Offutt AFB, Nebraska. His staff assignments include positions at the Joint Staff, U.S. Strategic Command, Headquarters International Security Assistance Force Joint Command, the Department of Energy and the National Security Council.

Prior to his current assignment, he served as Director, Global Power Programs, Office of the Assistant Secretary of Acquisition, Technology & Logistics, at the Pentagon.

Lt. Gen. Dawkins Jr. is a command pilot with more than 3,000 flying hours in fighter, reconnaissance and bomber aircraft.

EDUCATION

1988 Bachelor of Business, Baylor University, Waco, Texas
 1994 U.S. Air Force Weapons School, Nellis Air Force Base, Nev.
 1995 Defense Language Institute, Presidio of Monterey, Calif.
 1995 Squadron Officer School, Maxwell AFB, Ala.
 2000 Master of Aeronautical Science, Embry-Riddle Aeronautical University, Daytona Beach, Fla.
 2004 Army Command and General Staff College, Fort Leavenworth, Kan.
 2005 School of Advanced Air and Space Studies, Maxwell AFB, Ala.
 2009 Air War College, Maxwell AFB, Ala.

ASSIGNMENTS

November 1988–March 1989, Student, Officer Training School, Lackland Air Force Base, Texas
 April 1989–April 1990, Student, Undergraduate Pilot Training, Columbus AFB, Miss.
 May 1990–July 1990, Lead in Fighter Training, 433rd Fighter Training Squadron, Holloman AFB, N.M.
 August 1990–December 1990, Student, F-111 training, 389th Fighter Squadron, Mountain Home AFB, Idaho
 January 1991–January 1995, Instructor Pilot, F-111, Chief of Squadron Weapons and Tactics, 522nd and 428th Fighter Squadron, Cannon AFB, N.M.
 February 1995–January 1996, German Language Training, Defense Language Institute, Presidio of Monterey, Calif.
 February 1996–June 1996, Student, F-16 training, 308th Fighter Squadron, Luke AFB, Ariz.
 July 1996–February 1999, Flight Commander, F-16, 22nd Fighter Squadron, Spangdahlem Air Base, Germany
 March 1999–March 2002, Instructor Pilot, B-2, Chief of Wing Weapons and Tactics, 393rd Bomb Squadron, Whiteman AFB, Mo.
 April 2002–June 2003, Operations Officer, Deputy Directorate Global Operations (J-3), Joint Chiefs of Staff, Washington, D.C.
 July 2003–June 2004, Student, Army Command and General Staff College, Fort Leavenworth, Kan.
 July 2004–June 2005, Student, School of Advanced Air and Space Studies, Maxwell AFB, Ala.
 July 2005–May 2006, Director of Operations, 13th Bomb Squadron, Whiteman AFB, Mo.
 October 2006–January 2008, Commander, 338th Combat Training Squadron, Offutt AFB, Neb.
 January 2008–July 2008, Deputy Director, Global Innovation and Strategy Center, U.S. Strategic Command, Omaha, Neb.

July 2008–May 2009, Student, Air War College, Maxwell AFB, Ala.
 June 2009–May 2010, Commander, 509th Operations Group, Whiteman AFB, Mo.
 June 2010–January 2011, Director, International Security Assistance Force Joint Command Joint Operations Center, Kabul, Afghanistan
 February 2011–May 2011, Vice Commander, 509th Bomb Wing, Whiteman AFB, Mo.
 May 2011–January 2013, Commander, 5th Bomb Wing, Minot AFB, N.D.
 January 2013–September 2014, Principal Assistant Deputy Administrator for Military Application, National Nuclear Security Administration, Department of Energy, Washington, D.C.
 September 2014–July 2016, Director, Strategic Capabilities Policy, National Security Council, Washington, D.C.
 July 2016–August 2018, Deputy Director for Nuclear, Homeland Defense and Current Operations, (J-33) Joint Staff, the Pentagon, Arlington, Va.
 August 2018–June 2020, Commander, Eighth Air Force and Joint-Global Strike Operations Center, Barksdale AFB, La.
 June 2020–September 2020, Director, Global Power Programs, Office of the Assistant Secretary Acquisition, Technology & Logistics, the Pentagon, Arlington, Va.
 October 2020–present, Deputy Chief of Staff, Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, the Pentagon, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS

April 2002–June 2003, Operations Officer, Deputy Directorate Global Operations (J-3), Joint Chiefs of Staff, Washington, D.C., as a major
 January 2008–July 2008, Deputy Director, Global Innovation and Strategy Center, U.S. Strategic Command, Omaha, Neb., as a lieutenant colonel
 June 2010–January 2011, Director, International Security Assistance Force Joint Command Joint Operations Center, Kabul, Afghanistan, as a colonel
 January 2013–September 2014, Principal Assistant Deputy Administrator for Military Application, National Nuclear Security Administration, Department of Energy, Washington, D.C., as a brigadier general
 September 2014–July 2016, Director, Strategic Capabilities Policy, National Security Council, Washington, D.C., as a brigadier general
 July 2016–August 2018, Deputy Director for Nuclear, Homeland Defense and Current Operations (J-33), Joint Chiefs of Staff, the Pentagon, Arlington, Va., as a brigadier general
 August 2018–June 2020, Commander, Joint-Global Strike Operations Center, Barksdale AFB, La., as a major general

FLIGHT INFORMATION

Rating: command pilot
 Flight hours: 3,007 (combat: 267)
 Aircraft flown: F-111, F-16CJ, RC-135, B-2, B-52, B-1

MAJOR AWARDS AND DECORATIONS

Air Force Distinguished Service Medal
 Defense Superior Service Medal with two oak leaf clusters
 Legion of Merit with oak leaf cluster
 Defense Meritorious Service Medal with oak leaf cluster
 Air Force Meritorious Service Medal with three oak leaf clusters
 Air Medal with two oak leaf clusters
 Air Force Commendation Medal with oak leaf cluster
 Joint Service Achievement Medal
 Afghanistan Campaign Medal
 Humanitarian Service Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant March 17, 1989
 First Lieutenant March 17, 1991
 Captain March 17, 1993
 Major July 1, 2000
 Lieutenant Colonel April 1, 2005

Colonel Oct. 1, 2008
Brigadier General Feb. 7, 2014
Major General Aug. 2, 2017
Lieutenant General Oct. 1, 2020

(Current as of October 2020)

**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

MAY 17, 2022

RESPONSE TO QUESTION SUBMITTED BY MR. GARAMENDI

General DAWKINS. The Air Force defers to their colleagues at the National Nuclear Security Administration in regard to this question. [See page 11.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MAY 17, 2022

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. Both you and the Nuclear Weapons Council have said that producing 80 pits per year by 2030 is unachievable, even with increased funding for Savannah River. What impact will the delay have? What is a realistic goal for when we will be able to produce 80 pits per year?

Ms. HRUBY. Based on the latest conceptual designs and the cost and schedule ranges developed by subject matter experts, producing 30 war reserve (WR) pits per year (ppy) at LANL in 2026 is achievable; however, DOE/NNSA determined that the additional required 50 WR ppy production rate at SRS will not be achieved in 2030. Based on current planning, the pits produced at Los Alamos National Laboratory (LANL) are key to supporting the W87-1 Modification Program. The first war reserve pit for the W87-1 is scheduled for production in fiscal year (FY) 2023, seven years before the warhead's first production unit (FPU) in FY 2030. If delays to the LANL pit production rate occur, DOE/NNSA, in coordination with the Department of Defense (DOD), will explore risk mitigation options, including potential pit reuse.

DOE/NNSA is currently maturing the design for the Savannah River Plutonium Processing Facility (SRPPF) and is on track to complete design in early 2024. Implementation options to reduce schedule risk are being developed as the design matures with the goal to achieve 80 WR ppy as close to 2030 as technically and economically feasible.

Mr. COOPER. We are aware of the immense amount of work that NNSA is undertaking with a small, specialized workforce to sustain our legacy weapons and infrastructure, while also recapitalizing the nuclear enterprise. We already have concerns about NNSA's ability to deliver new and modified warheads on-time and on-budget. What would be the consequence of adding additional work related to expanded sustainment and/or life extension of the B83 or the development of a new or modified warhead for a SLCM-N? Would adding these activities create additional schedule risk for the rest of the program of record?

Ms. HRUBY. Such detailed workload analyses require definition of scope and timing due to the highly integrated nature of the nuclear security enterprise complex. The Sea Launch Cruise Missile-Nuclear (SLCM-N) program would have shared the W80-4 warhead with the Long Range Standoff Weapon (LRSO). SLCM-N was not included in the President's FY 2023 Budget, but would have resulted in additional scope to the W80-4 program, increasing schedule risk for the warhead and thus LRSO. The FY 2023 Budget does not include funding for activities to extend the B83-1 system's life. NNSA submitted a classified report to Congress titled, "Current Status and Surveillance Findings for the B83-1 System," which included an assessment of potential schedule effects of a B83 extension to other weapons programs across the nuclear security enterprise.

Mr. COOPER. NNSA is undertaking a strategic review of the Office of Defense Nuclear Nonproliferation's mission, organization, scope of efforts, and integration with other parts of NNSA, among other things. What motivated this review? What are the parameters and scope of the review? What do you hope it will accomplish?

Ms. HRUBY. NNSA has requested an independent strategic review of its Office of Defense Nuclear Nonproliferation (DNN) programs. NNSA works to continually evolve its approach to meet current and future threats, and this strategic review will further inform ongoing efforts in this dynamic global environment. The goal of the review is to identify significant national and global threats and opportunities facing DNN over the next 5-15 years and to inform NNSA on where it should consider investing more resources, how it can best leverage its resident expertise at U.S. National Laboratories, and how it can maximize its impact through collaboration with other NNSA, interagency, and international partners to advance NNSA's overarching global security mission.

Mr. COOPER. NNSA and the Nuclear Weapons Council have said that producing 80 pits per year by 2030 is unachievable, even with increased funding for Savannah River. How has DOD adjusted its plans to account for this reality? In what year must NNSA be able to produce 80 pits per year in order to meet DOD requirements?

Dr. PLUMB. The Nuclear Weapons Council is currently assessing actions to produce as close to 80 pits per year as possible by 2030, with initial recommendations

to be made by early fall of this year. Although the statutory requirement remains that, consistent with the needs of the Secretary of Defense, the Secretary of Energy, during 2030, will produce not less than 80 war reserve plutonium pits, DOD is working through the Nuclear Weapons Council to mitigate the impact of any delays to programs of record.

Mr. COOPER. How is the administration thinking about arms control and strategic stability following Russia's invasion of Ukraine? What is the administration's plan for nuclear arms control after New START?

Dr. PLUMB. Strategic stability dialogues, transparency measures, and arms control are all important for reducing the risk of nuclear use. Deterrence alone is insufficient. Although the current security environment—exacerbated by Russia's further invasion of Ukraine—poses a substantial obstacle, we will pursue further dialogue, transparency, and arms control with Russia if and when conditions allow. Both Russia and the United States have expressed support for extending nuclear arms control beyond New START.

Mr. COOPER. When should we expect an unclassified version of the Nuclear Posture Review?

Dr. PLUMB. The Department of Defense expects to release the unclassified Nuclear Posture Review after the release of the unclassified National Security Strategy.

Mr. COOPER. In the late 2020s and 2030s, the Air Force will face a difficult task of transitioning silo fields from Minuteman III to Sentinel, while operating both missiles simultaneously for several years. What steps has the Air Force taken to prepare for this transition? Are you confident that the appropriate personnel, resources, and oversight arrangements will be in place?

General DAWKINS. Yes, I am confident that the appropriate personnel, resources, and oversight arrangements will be in place.

The Minuteman system is programmed to remain operational for the next 14 years (through FY36). It will continue conducting mission assessments, condition-based maintenance, and testing until the system is fully transitioned to Sentinel.

The Sentinel weapon system (missile) will replace Minuteman missiles in a one-for-one fashion at a rate of 1 sortie (missile) per week for 9 years.

During the transition from Minuteman to Sentinel, the enterprise will maintain 400 missiles on alert with no degradation to the triad.

Until the last Minuteman missile is removed from alert, it will remain a safe, secure, reliable, and credible element of the land leg of the nuclear triad.

QUESTIONS SUBMITTED BY MR. CARBAJAL

Mr. CARBAJAL. The work NNSA does around the world through the Global Material Security program and its nonproliferation programs is critical to making the world a safer place.

Can you explain opportunities for nonproliferation and nuclear security efforts with countries that are not traditional international partners? How do you work with countries to minimize the risk of nuclear material from being smuggled to non-state or rogue actors? What programs within the nuclear proliferation portfolio would benefit from additional resources and funding above the budget request?

Ms. HRUBY. Over the past two decades, NNSA's Office of Global Material Security (GMS) has built relationships and partnered with over 100 countries, representing every region of the world. However, there are some countries, for example, Egypt, India, and South Africa, who have been hesitant to have direct, bilateral relationships with the United States on nuclear security. In these cases, GMS has been able to work with international organizations, such as the International Atomic Energy Agency (IAEA), to form multilateral partnerships with countries, or to work through laboratory-to-laboratory partnerships. In addition, GMS has worked with the full range of international organizations, such as the International Criminal Police Organization (INTERPOL), United Nations Office on Drugs and Crime, and the World Customs Organization (WCO), which take their cue to engage as the international law enforcement and customs communities from United Nations Security Council Resolution 1540, which obliges all states to prevent the illicit trafficking of all WMD-related materials. In areas of concern where GMS cannot work directly; for example, in Afghanistan, Iran, Russia, and Belarus, GMS works in surrounding countries to bolster capabilities to increase material security and detect smuggling. Overall, GMS explores multiple avenues to connect with partners and increase international material security.

GMS' Office of Nuclear Smuggling Detection and Deterrence (NSDD) works to build the capacity of partner countries to detect, disrupt, and investigate smuggling

of nuclear and radioactive materials that could be used in acts of terrorism. NSDD provides partners with tailored radiation detection systems based on assessments of high-risk smuggling pathways and operational environments. More specifically, NSDD provides detection systems at (1) high-priority points of entry, including land border crossings, rail crossings, airports, and seaports, (2) along frontier areas in between official crossing points, and (3) within the interior of states, including through cooperation with law enforcement and security services. These deployments create a layered defense and increase the probability of detecting smuggling activity. To facilitate long-term system operability, NSDD works with partners to develop their capabilities for the long-term use and the sustainability of deployed systems.

NSDD works with over 80 countries around the world, and typical partners include international law enforcement, intelligence, and border security organizations. NSDD is conducting outreach to more countries in the Middle East, Africa, South and Southeast Asia to address additional high risk smuggling pathways. NSDD coordinates closely with other U.S. Government agencies (e.g., Departments of Homeland Security, State, Defense, Commerce, and Justice) to maximize the impact of U.S. Government resources, and collaborates with international organizations such as INTERPOL, IAEA, the Border Monitoring Working Group, the WCO, and the Global Initiative to Combat Nuclear Terrorism, to promote consistency in global efforts to counter nuclear smuggling.

NNSA supports the President's FY 2023 Defense Nuclear Nonproliferation budget request of \$2.34B. This request provides the level of support needed to advance NNSA's nuclear security, arms control, and nonproliferation programs.

Mr. CARBAJAL. The GAO published a report in August 2021 regarding the Defense Nuclear Enterprise entitled "DOD Can Improve Processes for Monitoring Long-Standing Issues." The report recommended the Department provide guidance that the Nuclear Deterrent Working Group members periodically assess the process and outcome metrics and milestones for the remaining 2014 nuclear enterprise review recommendations. DOD concurred with this recommendation stating the DOD will draft updated guidance for the Nuclear Deterrent Working Group members. Has this guidance been written and transmitted?

Ms. ROSENBLUM. Yes, the Department of Defense has drafted updated guidance that is currently under review and awaiting Secretary of Defense's approval.

Mr. CARBAJAL. The GAO published a report in August 2021 regarding the Defense Nuclear Enterprise entitled "DOD Can Improve Processes for Monitoring Long-Standing Issues." The report recommended the Department provide guidance that the Nuclear Deterrent Working Group members periodically assess the process and outcome metrics and milestones for the remaining 2014 nuclear enterprise review recommendations. DOD concurred with this recommendation stating the DOD will draft updated guidance for the Nuclear Deterrent Working Group members. Has this guidance been written and transmitted?

Dr. PLUMB. This effort is well underway but has not been finalized.

