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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2020
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED SIXTEENTH CONGRESS
FIRST SESSION
SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FISCAL YEAR 2020 PRIORITIES
FOR DEPARTMENT OF DEFENSE
NUCLEAR ACTIVITIES**

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FISCAL YEAR 2020 PRIORITIES FOR DEPARTMENT OF DEFENSE NUCLEAR ACTIVITIES

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Thursday, March 28, 2019.

The subcommittee met, pursuant to call, at 11:00 a.m., in Room 2118, Rayburn House Office Building, Hon. Jim Cooper (chairman of the subcommittee) presiding.

Mr. COOPER. The subcommittee will come to order. First, I would like to ask unanimous consent that opening statements be inserted for the record. Hearing no objection, that will be done.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 27.]

Mr. COOPER. And second, I would like to ask our unusual unanimous consent so that members of the full committee, like Mr. Lamborn, are also able to participate in the subcommittee questioning, after subcommittee members have had a chance to ask their questions.

Hearing no objection—is the gentlemen asking for a recorded vote?

[Laughter.]

The gentleman withdraws his questionable objection.

I would like to welcome the distinguished witnesses before us today. I apologize on behalf of the House of Representatives that this is getting such a late start, but you know that is business as usual here. So since there are no opening statements, why don't we go ahead and hear from the witnesses.

We are lucky to have such a distinguished panel today, and I appreciate all the witnesses coming, but why don't we start with Secretary Trachtenberg.

STATEMENT OF HON. DAVID J. TRACHTENBERG, DEPUTY UNDER SECRETARY OF DEFENSE FOR POLICY, DEPARTMENT OF DEFENSE

Mr. TRACHTENBERG. Chairman Cooper, distinguished members of the committee, thank you for the opportunity to testify on the President's fiscal year 2020 budget request for nuclear forces.

The 2018 National Defense Strategy recognizes today's increasingly complex global security environment, characterized by overt challenges to the free and open international order and the reemergence of strategic competition between nations.

For decades, the United States led the world in efforts to reduce the role and number of nuclear weapons. Unfortunately, Russia and China have chosen a different path and have increased the

role of nuclear weapons in their strategies, along with the size and sophistication of their nuclear forces.

For this reason, a robust and modern U.S. nuclear deterrent is necessary to ensure that the reemergence of strategic competition does not lead to conflict or escalate to large-scale war.

Russia continues to prioritize high levels of defense spending to upgrade its nuclear forces and pursue advanced weapons specifically designed to counter U.S. military capability. Russia's nuclear modernization program covers every leg of its strategic triad and includes modern intercontinental ballistic missiles, submarine launch ballistic missiles, and long-range strategic bombers.

Russia's minister of defense has stated that by 2020, 90 percent of the country's strategic nuclear forces will be armed with modern weaponry. In March 2018, Vladimir Putin announced that Russia is developing even more new nuclear weapons capabilities. In addition, Russia is modernizing and expanding an active stockpile of approximately 2,000 non-strategic nuclear weapons that can be deployed on ships, bombers, aircraft, and with ground forces.

China continues its expansive military modernization and remains focused on establishing regional dominance and expanding its ability to coerce U.S. allies and partners. Modernization of its nuclear missile forces include deploying advanced sea-based weapons, developing more modern road-mobile and silo-based missiles and testing hypersonic glide vehicles. The Chinese are also developing a new nuclear-capable strategic bomber.

And although we remain hopeful that negotiations with North Korea may produce a pathway to peace and denuclearization, North Korea's nuclear capabilities pose a potential threat to our allies and our homeland and add to an already complex strategic picture.

The 2018 Nuclear Posture Review reflects the Department of Defense's strategic priority to maintain a safe, secure, survivable, and effective nuclear deterrent. Nuclear forces are the ultimate foundation of our Nation's security. Our deterrent forces must be modernized to remain credible. Delay is not an option.

The highest U.S. nuclear policy and strategy priority is to deter potential adversaries from nuclear attack of any scale against the United States or its allies. However, deterring a nuclear attack is not the sole purpose of nuclear weapons. U.S. nuclear forces are also intended to deter non-nuclear strategic attacks, assure allies and partners, achieve U.S. objectives if deterrence fails, and hedge against an uncertain future.

Effective deterrence of nuclear attack and non-nuclear strategic attack requires ensuring that potential adversaries do not miscalculate regarding the consequences of nuclear first use, either regionally or against the United States. They must understand that the costs far outweigh any perceived benefits from non-nuclear aggression or limited nuclear escalation.

U.S. nuclear declaratory policy is consistent with longstanding precepts that the United States would employ nuclear weapons only in extreme circumstances to defend our vital interests and those of our allies. Our policy also maintains the longstanding approach of constructive ambiguity regarding U.S. nuclear employ-

ment that has helped deter potential adversaries from nuclear coercion or aggression.

A policy of no first use would undermine U.S. extended deterrence and damage the health of our alliances because it would call into question the assurance that the United States would come to defense of allies in extreme circumstances. A no first use policy might embolden adversaries who may perceive it as a weakened U.S. resolve to defend our allies and vital interests with every means at our disposal. It may also undermine U.S. non-proliferation objectives if allies felt the need to develop or possess their own nuclear weapons for deterrence.

The 2018 NPR [Nuclear Posture Review] reaffirmed the conclusions of previous Republican and Democratic administrations that the diverse capabilities of the nuclear triad provide the flexibility and resilience needed for deterrence in the most cost-effective manner. Each leg is essential, complementary, and critical to ensuring no adversary believes it can employ nuclear weapons for any reason under any circumstances.

Unfortunately, each leg of the triad is now operating far beyond its originally planned service life. Most of the Nation's nuclear delivery systems will reach their end of service life in the 2025 to 2035 timeframe and cannot be sustained further. If not recapitalized, these forces will age into obsolescence. Consequently, we must not delay the recapitalization of the triad initiated by the previous administration.

The fiscal year 2020 budget request funds all critical DOD [Department of Defense] modernization requirements. The request for nuclear forces is roughly \$25 billion, or roughly 3.5 percent of the overall DOD budget. This includes \$16.5 billion to sustain and operate our nuclear forces and \$8.4 billion for recapitalization programs. The Department's request to recapitalize the nuclear enterprise is about 1.2 percent of the total DOD budget request.

Mr. Chairman, I am prepared to discuss arms control at length, including the administration's position on both the INF [Intermediate-Range Nuclear Forces] Treaty and developments with respect to the New START [Strategic Arms Reduction] Treaty.

But in the interest of time, let me conclude by stating that nuclear deterrence is the bedrock of U.S. national security. Our nuclear deterrent underwrites all U.S. military operations and diplomacy across the globe. It is the backstop and foundation of our national defense.

A strong nuclear deterrent also contributes to U.S. non-proliferation goals by eliminating the incentive for allies to have their own nuclear weapons. I urge the committee to support the important nuclear programs and funding contained in the President's fiscal year 2020 budget request.

Thank you again for the opportunity to testify and I look forward to your questions.

[The prepared statement of Mr. Trachtenberg can be found in the Appendix on page 28.]

Mr. COOPER. Thank you very much, Secretary Trachtenberg. Now we will hear from General John Hyten.

**STATEMENT OF GEN JOHN E. HYTEN, USAF, COMMANDER,
UNITED STATES STRATEGIC COMMAND**

General HYTEN. Thank you very much, Chairman Cooper, Ranking Member Turner, distinguished committee members.

It is an honor to be here today alongside my fellow Department of Defense leaders. It is also a continuing privilege to represent the 162,000 Americans that accomplish the mission of my command, U.S. Strategic Command, each and every day.

I want to begin by thanking the committee for your enduring support to our national defense. The stability afforded through this year's on-time budget came at a critical time for us, and I cannot overstate the enormous impact that it had on modernization efforts and our overall force readiness.

I would also like to express my gratitude to the Armed Services Committee for broadening our strategic deterrence and space discussions over the last few years and bringing them to the forefront of our national dialogue. Protecting Americans from harm is the single most important job of our government.

The methods we use must be the result of a robust debate and analytic rigor. Experts on all sides of the issue should be able to answer the tough questions that steer us to the best possible security solutions for our Nation.

But the most important message I want to deliver today is that I am fully confident in my command's ability to preserve the peace and decisively respond in any conflict. We are ready, postured, and partnered for all the threats that exist today, and no one should doubt this.

Our forces, our capabilities, and the strategic deterrence they help provide underpin and enable all joint force operations. They are the ultimate guarantors of our national and allied security.

STRATCOM's [U.S. Strategic Command's] first priority mission, strategic deterrence, is not a passive mission; it is an active mission, it is dynamic. Our capabilities and posture must continue to evolve as the global threat changes. And the threat is changing, as Secretary Trachtenberg just described.

Today, we are challenged by multiple adversaries, with an expanding range of capabilities that we must adapt to overcome these new threats.

To effectively deter—and, if necessary, respond—we must out-think, outmaneuver, out-partner, and out-innovate our adversaries. Deterrence in the 21st century is an active mission that requires integration of all our capabilities across all domains.

For over two decades, China and Russia have studied our way of warfare. They understand and seek to counter our long-held advantages. They are actively exploring new methods to exploit perceived vulnerabilities, and they are directly challenging us in areas of long-held strength.

My focus this year is to advance operations and modernization of the foundation of our national strategic deterrent, our nuclear triad. Our ICBMs [intercontinental ballistic missiles], submarines, bombers, and the weapons they carry are unique and complementary. The triad complicates our adversaries' decision calculus and has been a proven deterrent for over 60 years.

I will also intensify implementation as my new responsibility as the Department's nuclear command and control and communications, NC3, enterprise lead, meanwhile supporting a seamless transition as the Department stands up a new space force organization, as well.

A strong, continuing deterrent is critical to our Nation's security. Nuclear war cannot be won, and therefore it must never be fought, and so to preserve the peace, we must be ready for war. Today, we are ready.

I look forward to an on-time budget for fiscal year 2020, so we can sustain the momentum invigorating this Department right now. So thank you for the opportunity to be here today. I look forward to your questions.

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

Mr. COOPER. Thank you very much, General, and now we will hear from Vice Admiral Johnny Wolfe.

**STATEMENT OF VADM JOHNNY R. WOLFE, JR., USN,
DIRECTOR, STRATEGIC SYSTEMS PROGRAMS**

Admiral WOLFE. Chairman Cooper, Ranking Member Turner, and distinguished members of the subcommittee, thank you for the opportunity to testify on the budget priorities for nuclear forces and for your continued support of the Navy's deterrent mission.

I am honored to be here today and I respectfully request my written statement be submitted for the record.

Nuclear deterrence is the number one priority mission of the Department of Defense. The Navy Strategic Systems Program's, or SSP's, fiscal year 2020 budget supports the continued sustainment of that deterrent as well as the modernization efforts directed in the 2018 Nuclear Posture Review.

Additionally, although not part of the strategic nuclear portfolio that I manage, the SSP budget request supports the hypersonic conventional prompt strike program, an effort that leverages SSP's unique and critical non-nuclear skill set that the workforce has refined over the last 60 years.

The men and women of SSP and their predecessors have provided unwavering and single mission-focused support to the sea-based leg of the triad for over six decades. Now with a bow wave of development activities on the horizon, the organization must be prepared not only to support to today's deterrent but to ensure it remains a credible and effective strategic weapon system into the future.

As the 14th director, it my highest honor to represent the men and women of SSP, comprising approximately 1,700 sailors; 1,000 Marines; 300 coastguardsmen; 1,200 civilians; and over 2,000 contractor personnel;

It is my most critical goal, as the director of SSP, to ensure that 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.

Again, thank you for the opportunity to testify today on behalf of those who make deterrence their life's work. I look forward to your questions.

[The prepared statement of Admiral Wolfe can be found in the Appendix on page 63.]

Mr. COOPER. Thank you, Admiral, and now we will hear from Lieutenant General Richard Clark.

STATEMENT OF LT GEN RICHARD M. CLARK, USAF, DEPUTY CHIEF OF STAFF, STRATEGIC DETERRENCE AND NUCLEAR INTEGRATION, HEADQUARTERS, U.S. AIR FORCE; ACCOMPANIED BY LT GEN ARNOLD W. BUNCH, JR., MILITARY DEPUTY, OFFICE OF THE ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

General CLARK. Good morning, Chairman Cooper, Ranking Member Turner, distinguished members of the committee, on behalf of my wingmen, Lieutenant General Arnie Bunch, and myself, thank you for the opportunity to discuss Air Force nuclear programs and policies.

The return of great power competition is increasing the significance of nuclear weapons in our ever-changing strategic environment. Our primary strategic adversaries are modernizing existing nuclear and conventional systems, while pursuing new disruptive technology such as hypersonics, artificial intelligence, and cyber capabilities.

And despite the efforts of multiple administrations to negotiate nuclear stockpile reductions and the role of nuclear weapons, neither of our competitors have followed our lead.

In light of this, the U.S. must maintain a credible nuclear deterrent to promote strategic stability, protect the Nation, our allies, and our partners. Since the 1960s, every administration has recognized the critical role of the nuclear triad. The synergy of its three complementary legs ensures that we can deter strategic attack, assure our partners and allies, achieve strategic objectives, and hedge against future uncertainties.

Modernization and recapitalization are paramount if we are to maintain a credible deterrent in the evolving strategic environment. ICBMs deny the adversary the ability to preemptively destroy the U.S. arsenal with a small-scale strike. Replacing the Minuteman III with the Ground-Based Strategic Deterrent will provide a responsive, safe, secure, and accurate weapons system capable of holding adversary targets at risk.

Nuclear capable bombers are the most flexible and visible leg of the triad. Modernizing the B-52 and fielding the B-21 ensures stand-off and penetrating capability far into the future.

Cruise missiles such as the Long Range Standoff weapon can penetrate advanced air defense systems, execute multi-access attacks, and saturate enemy defenses. This weapon effectively extends the range of our bomber force, greatly complicating enemy defense requirements and costs.

Nuclear command and control communications is the central nervous system of our nuclear deterrent. Like the triad, legacy NC3 systems are aging and require persistent resourcing to sustain and modernize. It must link the President and the national leaders to the force all day, every day, under all conditions, and without fail.

The U.S. requires the tools necessary to prevent the most existential threat to our survival as a Nation. The flexible capabilities and complementary nature of the nuclear triad ensures the credibility of the U.S. deterrent while complicating the adversary's decision calculus.

It is the backstop of U.S. national security. It is both necessary and affordable, and we must continue to support the critical role of the triad in defending our country and our way of life.

Thank you, and I look forward to your questions.

[The prepared statement of General Clark can be found in the Appendix on page 75.]

Mr. COOPER. Thank you very much, General Clark, and as you pointed out, we also are welcoming Lieutenant General Arnold Bunch, Jr., with us today. Appreciate your being at the witness table, as well.

As I was walking into the hearing earlier, one of the attendees in the audience said you have today in this hearing four of the most important people in the world. That might be a little bit of an exaggeration, but it is probably not far from the truth, because when it comes to determining the future of the planet, the degree to which you bear your heavy responsibilities, it makes a difference.

So thank you for joining us today.

I want to be as considerate as possible to my colleagues who have joined us instead of taking an immediate flight home, so I will be very short in my questioning, but I thought that in many ways the most important sentence in all the testimony was what Secretary Trachtenberg said.

Top of page 5, and he also said this orally, we must not delay the recapitalization of the triad and our nuclear command, control, and communications system initiated by the previous administration.

Now, on behalf of the previous administration, I would like to take that as a compliment that American nuclear policy has generally been characterized by continuity, regardless of partisanship, regardless of politics, regardless of anything, and that continuity is, in many ways, our greatest strength. So I am hoping that even in this contentious political environment that continuity can be preserved.

Now, we don't want to just mouth the old boilerplate, and we have a heavy obligation on all of us to teach new generations why the boilerplate was crafted to begin with and, on occasion, to improve the boilerplate, but continuity is a great strength. So I am hopeful that in this subcommittee's deliberations and in full committee deliberations we can bear those important principles in mind.

For some of my fellow subcommittee members who haven't had a chance to see the testimony, there is a lot of information in here, and the written testimony, which has of course been already accepted by unanimous consent for the record, but appreciate the brevity of some of the presenters' statements, but the details in the testimony are sometimes awesomely important.

So I appreciate the hard work that was put into crafting the testimony.

I would like to now turn to my ranking member, Mr. Turner. Thank you for joining us, looking forward to your questions.

Mr. TURNER. Thank you, Mr. Chairman, and thank you for your statement and dedication to this issue being bipartisan, because it has, as you and I have said in Congress, since your second time in coming to Congress.

Is that right? When the chair was re-elected back to Congress after taking a period where he was not here, we were in the same class, so we have the same perspective of time period and we have been here during Republican and Democrat administrations, Republican and Democrat gavels with the speakership.

And I join him in saying that this has been a bipartisan commitment to deterrence, because this is about keeping us safe and it has kept us safe for years. And I think as long as we continue to be committed to a nuclear policy that is focused on deterrence, that we will continue to deter our adversaries, or as we have heard from our presenters, the great power conflict.

I want to welcome General Bunch. You soon will be going to Wright-Patterson Air Force Base as the head of Air Force Materiel Command. I look forward to you returning to Wright-Patterson Air Force Base and your leadership there.

Mr. Trachtenberg, I want to start with you. I have got two areas of questions and I am going to ask your opinion and General Hyten. Two concepts that we are struggling with in this committee are the issues of low-yield nuclear weapons and no first use policy.

And I would like—there are concerns, obviously, that if the United States does not have and deploy low-yield nuclear weapons, that our adversaries would believe that if they had undertaken an attack with low-yield nuclear weapons against us, that we might not retaliate because of all of our weapons being of such a large size that we would be deterred because we would be seen as escalating to their escalate.

We have a policy in war of trying to limit collateral damage, so I have two parts to my question. One, does it affect the calculus of our adversaries in a negative way that could put us at risk?

And secondly, are there targets in which we might want to use a low-yield nuclear weapon for which a high-yield nuclear weapon would be completely inappropriate, understanding that obviously that it is the most destructive force to unleash by man and the collateral damage that would occur?

And then, General Hyten, if you would answer the same.

Mr. TRACHTENBERG. Well, Congressmen, thank you. I couldn't agree more with you in terms of the emphasis on deterrence being key. The whole objective behind our policy of course is to prevent conflict and certainly to prevent nuclear war. So what we are doing and what we are proposing is entirely designed to reduce the risk of conflict by enhancing our deterrent through creating uncertainty in the mind of any potential adversary, whether it be Russia or China or anyone else.

I happen to believe that the supplemental programs that we announced in the Nuclear Posture Review in 2018 to include a low-yield ballistic missile warhead is certainly designed to help ensure that no adversary believes that they would have, at any point, any kind of advantage that they believe might be exploitable in a way

where they felt that they could either initiate conflict or escalate conflict to the point where the United States might have to think twice about responding at all.

So indeed, the purpose of moving forward with those programs is ultimately designed to improve our deterrent and to enhance stability.

General HYTEN. So, Congressman Turner, I think the most important element of deterrence is not our view, but it is what the adversary is thinking. We always have to try to put ourselves in the position of our adversaries and we have to listen very closely to what they say and watch very closely what they do.

And when we see statements, as well as when we see them operate in the ways that you described where they have stated they believe that employment of a low-yield nuclear weapon would not be responded to by NATO [North Atlantic Treaty Organization] or the United States, that causes a concern, and so the most important role of the low-yield nuclear weapon is to make sure that the adversary doesn't think that would happen. So the first role of that weapon is a deterrent weapon to make sure they don't cross that line.

And in order for that to happen, we have to be able to use that weapon in an appropriate way. We can't talk about what those would be here, but the second part of your question was, are there targets that we would employ them against? And I will just say for the record that, yes, there is, but we would have to discuss specifics in a classified session.

Mr. TURNER. Thank you. So secondly would be the no first use policy. I was just at the congressional dialogue at the Library of Congress that included author Michael—I am going to slaughter this I am sure—Beschloss? Thank you. It is Beschloss? Ah, I have it right. Author of *Presidents at War*. And he actually said something and I thought we should probably look at it at this committee.

He said that in the Korean conflict that there was a period of time which North Korea and China perceived that we might use nuclear weapons in that conflict and that because of their concern that it affected the outcome and the behavior of North Korea and China. And that at some point in the conflict they learned that we had decided not to—thank God, because obviously that would be an inappropriate use—but they had learned that we had dismissed that nuclear weapons would not be used and it affected the conflict negatively for us. Our adversaries became more involved.

So my concern with no first use is again, back to as you were saying General Hyten, what is in the minds of our adversaries. Mr. Trachtenberg, General Hyten, could you tell us as Michael has, what effect that might have on our adversaries? Thank you.

Mr. TRACHTENBERG. I would agree with you, Congressman Turner, and I would also agree with General Hyten in terms of what matters most is what is in the mind of our adversary. Further, I would agree with Chairman Cooper when he spoke about the continuity in U.S. nuclear policy.

One of the continuities in our policy has been that the United States has not adopted a no first use policy, regardless of administrations, because among other reasons we extend our nuclear secu-

rity guarantees, the so-called nuclear umbrella or the extended deterrent, to allies.

We do that in order to assure our allies that the United States is willing and able to defend their security under the most stressing of conditions, that we will be able to do that. As I said in my prepared statement, the concern I have with a no first use policy is that it may cause others to believe that we are backing away from some of our assurances to allies and partners and may reduce the level of uncertainty in the minds of potential adversaries and cause concern in the minds of some of our allies. And so for those reasons, I think a no first use policy would be destabilizing rather than stabilizing.

Mr. TURNER. General, you need to turn your microphone on.

General HYTEN. I think Chairman Dunford said it well on Tuesday, when he said that anything that simplifies an enemy's decision-making calculus would be a mistake. And that is exactly what this would do. That would create an environment where an adversary could think that crossing the line would be okay and that the United States would not respond to whatever the situation was.

I think the current policy is exactly right. It has been that way through multiple administrations. I think it is important to continue that policy. It improves our strategic deterrent. It improves the support that we give to our allies.

When I travel overseas, the extended deterrent message I bring from the United States is hugely powerful to our allies that have chosen not to build their own nuclear weapons and to trust that the United States nuclear umbrella will cover them.

Mr. TURNER. Thank you, Mr. Chairman.

Mr. COOPER. Thank the gentleman.

Now we will hear from Ms. Davis.

Mrs. DAVIS. Thank you, Mr. Chairman.

And thank you to all of you for your dedicated service and the way in which you have conducted yourself over the years. We greatly appreciate it.

I wanted to follow up on that discussion, because maybe I am here as a little bit of a doubter, and probably represent a good number of people who are really quite sophisticated enough to enter into this discussion and see that from their vantage point, as well. So I would be—you know, continue to be unconvinced of the value of low-yield nuclear weapons as part of our arsenal.

I would like to ask you,—and you have certainly addressed this, Mr. Trachtenberg and General Hyten, particularly—but can you tell us on a personal level, how did you arrive at that position?

And if you have someone who, you know, looks at you in the eye and says, okay, so what is next? How does that what is next—how is that addressed by our current stockpile? You know, it calls into question use after that. And what is next?

Mr. TRACHTENBERG. Well, if I might, Congresswoman, first of all, let me say, I appreciate the opportunity to engage in this discussion. It is very important, and I understand there are differing views among people who have followed this issue for many years.

I do have to come back, however, to the view—it is my personal view that when we are talking about such serious matters of nuclear deterrence, it really is very critical for us to try to assess as

best we can how an adversary or how a potential adversary views the issue.

We have tried to look at, for example, Russian military doctrine, statements, military deployments, capabilities, investments, exercises. And I have to say that what we have seen—what I have seen certainly in recent years has given me significant pause and concern in terms of how I think the Russian Federation actually views these issues of deterrence.

And therefore, I look at the issue of, say, a low-yield ballistic missile warhead as something that I believe would be useful in trying to at least close a gap in capabilities that I think Russia may be looking at as affording them some kind of advantage that they could use to either engage in nuclear coercion or some type of aggression.

And so I am looking at it from the standpoint of how I think the other side may be approaching this and what we might be able to do in order to best make them think twice about the course that they may be on as a result.

Mrs. DAVIS. What comes next, and maybe for all of you too, what?

General HYTEN. So ma'am, when I looked at it—I looked at it just from a threat perspective. As a commander of—the nuclear commander for our country, I have to look at the threat and then I have to make sure that my command is best postured to respond to that threat as I could.

And as we looked at it in the Nuclear Posture Review, we saw a threat that was out there that we didn't have all the capabilities that we thought we needed to respond to that. We already have some low-yield nuclear weapons in our arsenal. They are in the air leg of the triad. They are not in the submarine leg and they are not in the ICBM leg. We felt like we needed a small number of immediate response capabilities to do that.

But it is also interesting to note that our low-yield nuclear weapons will all be inside of the New START agreements. Almost all the Russian nuclear weapons are outside the New START agreement, building under platforms that aren't accountable.

Actually, when we remove the weapons, the big weapons from the submarine and put small weapons in, we are going to have still the same number of weapons, they will just be a smaller yield. But we think that smaller yield actually gives us a better chance to deter our primary adversary.

And I think what comes next is that this puts us in a very good place that we can deter for the coming—if this was the Cold War, we would be going back and we would build all the things that the Russians are building now, nuclear-powered torpedoes, nuclear-armed torpedoes—

Mrs. DAVIS. If we had them in the past and more capabilities that you are speaking of, would we have used them? At what time?

General HYTEN. If they worked, we wouldn't have used them. The whole goal of these weapons is to not use them. That is a dichotomy that is hard for many of our fellow countrymen to understand. But the key is, by being ready, by being obviously ready and communicating that to the adversary, they will not cross the line

and we will not have to use them. If we are not ready someday, that is when I get concerned that somebody will cross that line.

Mrs. DAVIS. I think my time is up. So I can't go to the rest of you, but thank you very much for being here.

Mr. COOPER. Thank the gentlelady.

Mr. Bishop.

Mr. BISHOP. Yes, thank you.

And I thank our witnesses here, it is—you are basically all saying the same thing, I guess. One of our tasks is to tell the 427 members who aren't here exactly what you guys are saying.

I do have a couple of questions, General Clark, if I could start with you, almost a parochial one. Has the Air Force ever considered directing the two GBSD [Ground-Based Strategic Deterrent] prime contractors to utilize both suppliers of the solid rocket motors for the program development and production? And if so, would there be a benefit or a programmatic challenge of doing that approach?

General CLARK. Sir, thank you for the question. And that is under consideration right now. I would have to defer, however, to my wingman, General Bunch, who is our acquisition expert and he is involved heavily in this process. So, General Bunch?

Mr. BISHOP. I thought we were the only ones that deflect. But go ahead, General Bunch, please.

General CLARK. Yes, sir, I am learning.

General BUNCH. So sir, we are in those discussions right now.

We are weighing out the cost, and the schedule, and the performance, technical risks associated to the programs if it were to go to and direct, that we had to use each of the solid rocket motor producers. We are also weighing that against the risk to the industrial base. We are having those ongoing dialogues within the Department of Defense.

And then once we look at that equation and where those risks are, as the acquisition part of this team, we have to go back to the requirer part of this team, General Hyten, and explain what those risks are both from a performance, and a schedule, and cost and how that plays out on a timeline, so that we can determine if we can meet his requirements. So that debate and discussion is ongoing right now.

Mr. BISHOP. You are still in the process.

General BUNCH. Yes, sir, we are.

Mr. BISHOP. When you get done with that, I would like to actually know the response of that one also.

General BUNCH. Yes, sir, we will.

Mr. BISHOP. General Hyten, either you or the Secretary, let me ask the same thing. CBO [Congressional Budget Office], bless their hearts, have put a 30-year score on GBSD, or our nuclear policy, and it has been described as eye bleeding. Any time there is a 30-year score, whoever is doing that uses an eight ball and a Ouija board, but what I would like to ask you is obviously I have questions on the methodology of CBO.

But they have both tried to conduct the modernization and operations in the same number. So if I could have you kind of divest those, tell me, what would the operation number simply be—or I

am sorry, the modernization number simply be? And perhaps even as a percentage of our overall defense budget?

General HYTEN. So I will start, Secretary, if that is okay? So the specific numbers are in my prepared statement, and we will get to the exact numbers if you would like for the record.

[The information referred to can be found in the Appendix on page 89.]

General HYTEN. But broadly speaking, at the height of the build-out of our nuclear capabilities, it would add up to about—our numbers say 6.4 percent—the CBO said 7 percent of the entire defense budget, which means 93-plus percent of defense budget would be available for other things.

And this is the most important item in our defense budget, I think that is a reasonable thing. Now are you talking about operations—

Mr. BISHOP. Wait, I think you just said the next question which is—if it is 6 percent or 7 percent, is that worth the cost?

General HYTEN. I think former Secretary Mattis said it right, America can afford survival and this is about our Nation's survival. We have to look at it that way and go down that path. Now, inside that roughly 6 percent that we get to at the height of it a little over 3 percent would be in modernization and a little under 3 percent would be operations sustainment. And I have the specific numbers in my prepared statement.

Mr. BISHOP. We will get them from there. I thank you. And let's suppose just for a second that we do something really silly around here, and we postpone funding of this—we push it to the right. Can you tell me quickly what would be either mid- or long-term financial or programmatic significance of any kind of delay in that funding?

General HYTEN. As Chairman Cooper pointed out, and so did Secretary Trachtenberg, this modernization program started in the last administration, but it started late. We should have started a decade ago. My biggest long-term concern as STRATCOM—I am not concerned about anything today actually. I am ready to respond to any threat anywhere.

But I am concerned 10 years from now unless all of these stay on track, that a future STRATCOM commander will sit in front of you and say I am concerned about the readiness of my force, because the submarines will deliver just in time; when *Ohio* goes off, *Columbia* comes on; when GBSD comes on, Minuteman goes off.

Mr. BISHOP. So 2035 would be out of the question, if we keep pushing to the right.

General HYTEN. 2030 is the date where we have to have these come online, and everything right now delivers just in time.

Mr. BISHOP. Can I ask just one last favor? GBSD is a terrible name, it has no beauty—it sounds like one of those medical diseases you try and eliminate; Minuteman, that is cute. Come up with a better name. And the other problem I have is, is simply if we are going to argue first use, we already used it, we have done that historically. Get over it. Let's get on with that issue.

General HYTEN. So I concur with the name. It is just horrible. And I—

Mr. BISHOP. I keep getting—

General HYTEN [continuing]. And I would encourage my Air Force to come up with a name for that program.

Mr. BISHOP. Get that before the numbers.

General HYTEN. Yes, sir.

Mr. BISHOP. Thank you.

Mr. COOPER. Thank the gentleman. The next questioner will be Mr. Brooks—he is gone. Mr. Rogers.

Mr. ROGERS. Thank you, Mr. Chairman. General Hyten, in the past, outside advocates have argued that LRSO [Long Range Standoff weapon] is destabilizing. What is your thought?

General HYTEN. Well, we have had nuclear-powered cruise missiles, or nuclear cruise missiles for a long time—not nuclear-powered cruise missiles, but nuclear-tipped cruise missiles for a long time. We have also had conventional cruise missiles for a long time. We have had them for years, decades. It has never been destabilizing before. I don't know how it is destabilizing now.

It is interesting to note that the Russians employed cruise missiles in Syria. Somehow we weren't concerned that they were deploying nuclear weapons into Syria and we didn't respond like they were deploying nuclear weapons into Syria.

Cruise missiles have been dual-use capabilities for a long, long time and nothing changes in 2019 that wasn't the same in the last century. It is the same structure. I don't believe they are destabilizing.

Mr. ROGERS. Excellent. General Clark, in the beginning of the GBSD program, my buddy's favorite name, did the Air Force do an assessment on the service life extending of the Minuteman III versus a GBSD? And which is the most cost-efficient way?

General CLARK. Yes, sir, thank you for that question. We did do an analysis of alternatives on GBSD and considering the continued sustainment of Minuteman III was one of those alternatives that was analyzed, and it is less cost effective to try to extend the life of Minuteman III. We have several of the components that are becoming obsolete—the propulsion system, the guidance system, even the ability to provide the solid rocket motor fuel—we only have one more opportunity to do that for these weapons. After that we have to—we will have to buy a new weapon.

And as General Hyten stated, if we continue to push this decision down the road, these systems that are part of the overall system start to come off, the missile comes offline, and then it costs us even more money to recapitalize and modernize.

So our best alternative as General Hyten stated is to recapitalize now. We will sustain Minuteman III until GBSD comes online, but we are right at the point of being able to make that happen now, sir.

Mr. ROGERS. When is it supposed to come online?

General CLARK. It—we start coming online in the early 2030s and by the mid 2030s we are complete, and I will—

Mr. ROGERS. We are going to pass the date of the end of service life before those are online—

General BUNCH. Congressman Rogers, can I add just one item into that? I am sorry, sir, I didn't mean to interrupt you, I apologize. It is a great question. Our IOC [initial operating capability] right now for GBSD is 2029. That is when we have reached the ini-

tial operational capability and our full operational capability is 2036.

So we are tracking, exactly as General Hyten said, we need these by 2030, we are right on the timeline. That is why it is so critical that we continue to execute these programs the way we are.

Then one other item I would add to what my wingman said here is, even if we did the SLEP [service life extension program] on the Minuteman III, there are requirements that General Hyten has that we do not believe we would be able to meet. So it is not just about the cost, it is about the ability to meet the warfighter requirement that were also weighed in to that decision when we did the analysis of alternatives.

Mr. ROGERS. Admiral Wolfe, can you talk about the—what the Navy is doing with the PEO [program executive office] *Columbia* class to better integrate the work you were doing in SSP with the overall program? What is your assessment of the pace of the *Columbia* replacement?

Admiral WOLFE. Yes, sir. So *Columbia*, although not in my direct portfolio, we stay very, very close on the development on the *Columbia*-class submarine. That is still on plan. As a matter of fact, if you look at what CNO [Chief of Naval Operations] has just published in his design for superior 2.0,[†] it actually—he challenges that program to pull the *Columbia* left and get it out sooner, per General Hyten's point of, you know, we are line on line right now.

So that program is moving forward. Obviously, I know Secretary Geurts has briefed you on—they have stood up a separate program executive officer specifically for *Columbia* because this is the Navy's number one acquisition program. And so, that is for the submarine.

From our perspective, what we are doing on the weapons system, we are on track for both modernizing the *Ohio* weapons system, which will then go on the *Columbia*, so we will not have two populations. So all of those efforts are on track right now, sir.

Mr. ROGERS. Excellent. Thank you all for being here and thank you for your service to our country. I yield back, Mr. Chairman.

Mr. COOPER. I thank the gentleman. Ms. Horn.

Ms. HORN. Thank you, gentlemen, for being here today. And I want to echo Mr. Cooper's comments and everyone's comments about the importance of making sure that we are creating consistency and prioritizing. So I want to continue along that line of questioning, and I hope you can help me understand a few things.

Given that we don't have unlimited funds to do all that we need to do—and I am sure we could continue to invest in more things and making our choices—can you help me understand a little bit more on the—I know we have been talking along the lines of the current low-yield weapons and the modernization and transitioning to the new ones, that distinction of if there any pathway to draw down one or transition to—between the two. And that—General Hyten and Mr. Trachtenberg.

General HYTEN. Ma'am, one of the good things about the low-yield nuclear weapon, its nomenclature is the W76-2. It is actually

[†] Referring to the document "A Design for Maintaining Maritime Superiority, Version 2.0" released December 17, 2018.

just a modification of the W76-1 that has been going through a production line in the Department of Energy for the last few years. And as they are approaching the end of that, the only thing we had to do to build the W76-2, the low-yield nuclear weapon, was make what—you know, they are nuclear weapons, so there is nothing minor about a nuclear weapon.

But in the realm of the work that is done at the nuclear weapons lab, it is a fairly minor adjustment to that weapon to make it a low-yield nuclear weapon. That work has begun this year; that work is underway right now.

That budget is a very small amount of the overall budget to get to that. And then the employment on the submarines is actually a straightforward process. As we build out the submarine, as we go through—we can talk about how we do that in a classified world—but as we go through that, we will just take this weapon, put it into the missile—and we still have to load the missile, just like you always do. So there is really no cost delta there. In the overall scheme, it is a very small number.

Mr. TRACHTENBERG. Congresswoman, I would agree with you, in terms of the necessity of prioritization. And obviously, this is something that the Department looks at very carefully. But I would echo General Hyten's comments, as well, in terms of looking at the low-yield ballistic missile warhead, the program, as relatively inexpensive vis-a-vis other programs.

We have asked in the fiscal year 2020 budget for about \$19.6 million to pursue that program. We do think it is a reasonable investment to make for the ultimate objective of enhancing our deterrent against what is the most destructive potential possibility that we can think of.

Ms. HORN. Thank you. And following on with that, that line of prioritization, with our current challenges, this is clearly an incredibly critical area, but with our current challenges in the—in the rest of our strategic space, missile defense, new technology development space, and the growing numbers of adversaries and the attention and the money and the development that they are putting into this, I would just like to hear from both of you, and then if there is time, anyone else, about what you see as the right balance between investments in those critical areas so that we don't lose our strategic advantage there and here in the nuclear arena, please?

Mr. TRACHTENBERG. Certainly, Congresswoman. I do think that we have certainly intended to strike the right balance in our investments going forward, and I think the budget request that has been submitted to Congress reflects our prioritization based on our assessment of what the right balance is.

We have, of course, focused on readiness, but also on modernization in this budget. You are exactly right to note that adversaries and potential adversaries have been moving forward with advanced technologies quite at a rapid pace. We all know that technology advances quite substantially, very rapidly.

We believe the investment priorities we have set out, at least in terms of our recapitalization of the nuclear force, some of the supplemental capabilities that we have been speaking about that were reflected in the Nuclear Posture Review, as well as in the missile defense review and some of our missile defense priorities, reflect

not only an appreciation but an understanding that we need to invest more in terms of the advanced technologies, not only for ourselves, but also to counter the investments that potential adversaries are making on those technologies, as well.

Ms. HORN. I think my time has expired, so I will defer to the chair.

Mr. COOPER. The gentlelady's time has expired. The gentlelady from Wyoming.

Ms. CHENEY. Thank you very much, Mr. Chairman, and thank you to all of our witnesses for being here today. General Hyten, thank you very much for hosting me at STRATCOM recently. It was a very useful and informative day spent there, so I appreciate very much your taking the time to do that.

I wanted to ask you first, General Hyten, about pit production, and if you could talk a little bit about sort of where we stand and specifically what is driving the requirement for the 80 pits per year that we are seeing now.

General HYTEN. So thank you. It was good to have you at Offutt. Thank you very much for coming and spending time at STRATCOM. We have had a little water there since you were there, but STRATCOM is doing fine. The base has got some serious damage, but STRATCOM is a pretty amazing command. We are doing just fine.

When you look at pit production, I think it is important to realize the United States really hasn't been producing plutonium pits for quite a while. We have been using old plutonium pits to refurbish and build. Even the new weapons are using old plutonium pits.

What I am concerned about, from a STRATCOM perspective, as we look in the out-years and we get into future, we could be dealing with 100-year-old plutonium pits sometime. And we don't really know what a 100-year-old plutonium pit looks like. Now, plutonium has a very long half-life.

But I have looked at the plutonium pits. I have looked at that structure. And I am concerned about building new weapons that will have 100-year-old plutonium pits. I think that is just a risk that the United States should not take.

We need to reinvigorate that process. And so we have gone through a detailed analysis with the Department of Energy and the Department of Defense, but STRATCOM has been in the middle of it, to look at exactly what we need and we have some very specific numbers. The minimum requirement is by 2030 we need a plutonium pit production capacity up to 80 across the enterprise. The first step to getting that is 2026 we need 30 a year, by 2026.

Those first 30 will happen at Los Alamos. We have a plan with the Department of Energy that we support that will get to 80 at both Los Alamos and Savannah River in South Carolina to get to what we need for the future, but that will put us on a sustainable path through this century to make sure we have the right infrastructure for our future nuclear stockpile.

Ms. CHENEY. And I am hopeful that—it is too bad we weren't able to get NNSA [National Nuclear Security Administration] here today to talk to us about this. We will follow up with them. When you look at what we are doing right now to get to the 30 by 2026,

what is your sense of the progress we are making? Are you comfortable that it is sufficient? What is your feel about that?

General HYTEN. So I am comfortable that all energy is being put on that. I still worry about that because it is going from zero to 30. And 30 doesn't sound like a big number probably to many of the committee, but going from zero to 30 is a huge step because plutonium is a very difficult material to work with. And so we watch that very closely and I have a stockpile assessment team that I send to Los Alamos, I have my staff go to Los Alamos.

Because I have to certify the nuclear stockpile every year, I probably spend a lot more time down deep in the technical weeds than most combatant commanders do, but that is one of the most important things I do is certify the nuclear stockpile and I have to understand where that is.

So Administrator Lisa Gordon-Hagerty and I have a very, very close relationship, and we are working hand-in-hand to make sure that we can deliver that capability the Nation needs. But it is going to take a lot of work to get there.

Ms. CHENEY. Thank you. And then turning to our space sensor layer, Missile Defense Agency [MDA]—we have talked in this committee and certainly we have provided an increase of \$73 million last year for that. But now this has appeared as the top issue on the unfunded priorities list for MDA.

Could you give us a little bit of enlightenment in terms of what is happening there and what exactly the Department is doing in response to the hypersonic and ballistic defense space spending?

General HYTEN. So, Congresswoman, in my letter to Congress this week I also noticed that I am watching closely the space layer of our missile defense capabilities, as well.

I watch it from a STRATCOM perspective though, because the thing that enables our deterrence is the fact that we can see any threat from wherever and we can characterize it, attribute it, and then respond to it if we have to. That enables our deterrent. We need that in the space sensor layer, and we appreciate very much the \$73 million that Congress appropriated last year.

That is now transitioning into the Space Development Agency. Dr. Mike Griffin has that responsibility. We are pushing hard to make sure there is \$15 million in the budget this year for sensor technology. There is a DARPA [Defense Advanced Research Projects Agency] program that is looking at that.

Dr. Griffin has got to integrate all those things together. We certainly were hoping for increased funding this year, but the Department has to make difficult decisions as we go through. But Dr. Griffin has got his job this year putting all those pieces together and having a good plan for this Congress next year.

Ms. CHENEY. Thank you, General. My time has expired.

Mr. COOPER. The gentleman from Colorado.

Mr. LAMBORN. Thank you, Mr. Chairman, and thank you for all the witnesses for being here and for your service to our country. Admiral Wolfe, regarding our hypersonic weapons programs, I have got several questions. I hope these haven't already been asked. I was out of the room at another committee hearing, but I am back now, so I would like to pursue this line of reasoning a little bit.

Some of my colleagues on the other side of the aisle have worried about the potential for a miscalculation. They worry that the Russians or Chinese won't be able to tell the difference between a sub-launched hypersonic and a sub-launched nuclear weapon. So you as someone who has worked on both types of systems, can you help clarify key observable differences that would help put our minds at ease?

Admiral WOLFE. Yes, sir, thanks for the question. So at the unclassified level what I will tell you is that there is no doubt when a weapon initially comes out of a submarine launched—a submarine, they look very much the same when they come out.

But what I will tell you is because of the difference in a hypersonic and a ballistic missile, that quickly for anybody that can see it can quickly tell that they are not the same. That is the first issue.

If you look at the size of the boosters that we are talking about, the signature is much different. When you look at the flight profile, they quickly diverge between the two. That is the first key issue from a technology perspective.

Second is, if you look at where we believe a conventional hypersonic would actually be deployed, it would be in a much different area than where our SSBNs [ballistic missile submarines] deploy, so that would be an indicator.

And, thirdly, which is also key to that, is there is no plan to put a conventional weapon onto one of our strategically loaded SSBNs. So again, you will have separation from those two.

Mr. LAMBORN. Okay, thank you. And, Admiral Wolfe and Mr. Trachtenberg, what are the operational advantages of a land-based versus a sub-based hypersonic weapon?

Mr. TRACHTENBERG. The operational advantages of a land-based device, a sub-based hypersonic weapon—I think in terms of the operational details I will defer to Admiral Wolfe on that. But obviously much depends on the basic mode of the weapon itself and where the weapon is based. So depending upon where we would look to base a hypersonic weapon against a particular threat, I think that would factor into the operational characteristics—

Mr. LAMBORN. So geography.

Mr. TRACHTENBERG. That would be one factor, yes, sir.

Mr. LAMBORN. Okay.

Admiral WOLFE. Yes, sir, I would agree. And of course, it is all about access and it is all about the target set that you need to go after. I will tell you, there are advantages to both, which is why as part of what we are doing with our memorandum of agreement in the Department of Defense, we are commonly developing this technology between us, the Army, the Air Force, and even the Missile Defense Agency for just the basic technology. So I think, again, it gives you a portfolio of options with that weapon.

Mr. LAMBORN. Okay, thank you. And lastly, Admiral Wolfe, we just had a closed briefing with you on hypersonic weapons but the organization and budgetary lines are still unclear. How much are we—how much is the DOD asking for hypersonic weapon development in this year's budget? And how much of that are you responsible for? And what are the specific milestones you want to reach, for what you can say in this setting?

Admiral WOLFE. Yes, sir. So from a DOD perspective, I don't have the overall DOD number, so I would ask that we take that for the record and get back—

Mr. LAMBORN. Okay.

Admiral WOLFE [continuing]. To you with the DOD line.

[The information referred to can be found in the Appendix on page 89.]

Admiral WOLFE From a Navy perspective, my budget request in 2020 is for \$593 million, and what that does is it continues the effort that we started in fiscal year 2019 for both getting to additional flight testing of the actual hypersonic body itself to continue to prove the technology.

It continues the development effort for the booster, which the services will use for that weapon. And then it also continues the integration onto the platforms—the studies for which platforms it will be deployed in the Navy, and to then start that integration into those platforms.

Mr. LAMBORN. And do you have any particular milestones that you would like to reach or is that still to be determined?

Admiral WOLFE. So obviously getting to key flight test is critical, and that is about all I can say in this forum, sir. In a classified forum, we could talk about what—what we are planning and when we are planning on doing it. Yes, sir.

Mr. LAMBORN. Certainly. Okay, thank you. And once again thank you all five of you for your service. Mr. Chairman, I yield back.

Mr. COOPER. Thank the gentleman. I think all members of the committee have had a chance to ask a question. If anyone has a pressing question they would like to follow up on, I would be happy to yield to you. Otherwise, I will conclude the hearing with an opportunity—Ms. Davis?

Mrs. DAVIS. Thank you, Mr. Chairman. Just very briefly, could you just clarify for me that the Pentagon had proposed funding in the 2020 budget for the low-yield SLBM [submarine-launched ballistic missile]. Is that in the OCO [overseas contingency operations] budget?

Admiral WOLFE. Ma'am, I would have to go check. I don't believe it is in the OCO budget. If I look at my line, it is rolled up into other efforts that we are doing for RDT&E [research, development, test, and evaluation]. But I would have to take that for the record to actually verify that. That is for the low yield. There are other parts of my budget which are in the OCO line, yes, ma'am.

Mrs. DAVIS. Mr. Trachtenberg, where is it?

Mr. TRACHTENBERG. No, I believe that is correct. I believe that is correct, Congresswoman. But I would want to confirm that for the record.

[The information referred to was not available at the time of printing.]

Mrs. DAVIS. Correct that it is not in the OCO budget?

Mr. TRACHTENBERG. That is my understanding. But I would like to confirm that.

Mrs. DAVIS. Okay, apparently somebody saw it there.

General HYTEN. And then the actual weapon itself is in the Department of Energy budget.

Mrs. DAVIS. Okay, okay. All right, because obviously there are concerns about its use, where the OCO budget is used for. Okay, thank you very much.

Mr. COOPER. I thank the subcommittee members for their questions. I think the only major topic that hasn't been touched on is the space force. And I would like to give General Hyten a few minutes here to summarize his ideas for the space force.

General HYTEN. Thank you, Chairman. I appreciate the opportunity. I think there is a couple things I would like to share with the committee. I think first and foremost, I appreciate this committee taking on space as a warfighting challenge a couple years ago.

And I very much appreciate the President weighing in and talking about space as a warfighting domain. It is a place now that we conduct military operations. It is a place that our adversaries are building capabilities and deploying capabilities to threaten us in space, and we have to deal with it seriously.

I think the most important thing we can do in the near term is stand up a new unified command moving space out from under my command, out from under U.S. Strategic Command, and creating a new U.S. Space Command focused 100 percent of the time on the space problem.

Because I have been in the space business my whole life, and I love the space business. But I am the STRATCOM commander. And space at best will never be higher than my third priority. It has to be nuclear first, nuclear command and control second. Space will never be higher than my third priority.

I get to spend so little time on space because I have to focus on nuclear. We need a commander focused on space all the time. And that commander was nominated this week, General Jay Raymond. And I hope the Senate takes up that nomination quickly.

The second piece is the space force. The President said we need a structure inside the Pentagon focused on space all the time. And I support that structure.

I have to admit, I had some concerns when we were talking about a separate service, separate and distinct from the Air Force. But when the President made the decision and said it has got to be under the Air Force, I am all in.

I think the Vice President said it exactly right. He said, so creating the space force within the Air Force is the best way to minimize duplication of effort and eliminate bureaucratic inefficiencies. That is what the President and the Vice President told us to do.

Now, I understand in meeting with many of you over the last 24 hours that there are some concerns about that. But I just want you to know from my perspective, if you see any bureaucratic inefficiencies in there, if you see any duplication of effort, I would support just taking that stuff out. We need a streamlined focus.

The problem we are trying to solve there is there are so many people in the Pentagon that are in charge of space. We need one person in charge of space that will then organize, train, and equip forces for the new U.S. Space Command. That is the structure that has to be out there.

I think the President's vision is right, and it is also very similar to where this committee was starting as long as 2 years ago. I

think somewhere we can come to agreement on what that is and create that structure that will allow us to deal with the space problems we need in the future. So thank you very much for letting me talk about that.

Mr. COOPER. The gentleman from Ohio.

Mr. TURNER. I just want to thank the chairman for asking that question. That was a great answer, General Hyten. I greatly appreciate it. I think that really is going to help our debate here.

And obviously, we look to your expertise because—you know, it is real application of what is happening. So, thank you for that answer. And, Mr. Chairman, thank you for asking that question.

Mr. COOPER. I thank the gentleman. If we could get your answer on a YouTube video and require all of our colleagues in the other body to watch that, I wouldn't even mind if it was set to music or something like that, anything to induce them to watch it.

Mr. TURNER. Just think——

Mr. COOPER. It would be helpful.

Mr. TURNER. Can we put an emoji in the background of you dancing?

Mr. COOPER. No, no, no. Perhaps John Lewis, he has a very good dance. But there are few more important topics than this for this Congress, so I appreciate your weighing in. I would like to thank all of the witnesses for their excellent testimony.

The subcommittee is adjourned.

[Whereupon, at 12:05 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 28, 2019

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 28, 2019

Statement of Hon. Jim Cooper
Chairman, Subcommittee on Strategic Forces
Hearing on
Fiscal Year 2020 Priorities for Department of Defense Nuclear Activities
March 28, 2019

Good morning. The purpose of today's hearing is to hear testimony on the Fiscal Year 2020 Budget Request for the Department of Defense's nuclear forces. The most important job of government is to defend the nation, and the #1 priority of our defense department is to maintain our nuclear deterrence capability.

Here today to testify are Deputy Under Secretary Trachtenberg, General Hyten, Vice Admiral Wolfe, and Lieutenant General Clark. Thank you for coming today to provide your views on these vital issues.

As the witness' testimonies note, both China and Russia have recently undertaken significant modernization of their nuclear forces, while the United States has been very slow to respond. Thankfully, as your testimonies also note, our forces remain dominant. However, in order to maintain that position, the Department must modernize our submarine, bomber, and missile delivery systems, a hugely expensive recapitalization. Fortunately, our warheads have been properly maintained and their lives are being extended under various life-extension programs.

Our last nuclear modernization effort, under President Reagan, went hand in hand with a robust diplomatic effort to limit Soviet nuclear arsenals with arms control. By the end of next year, the New START will expire unless it is renewed. Unlike with the INF Treaty, the Russians are complying with New START. New START not only limits Russian nuclear capability but also gives the United States significant insight into the Russian strategic nuclear forces. I look forward to hearing your views on extending the New START Treaty, an extension that could give the United States five more years of predictability and transparency—as well as keeping a lid on Russia's strategic nuclear forces capable of reaching the United States.

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

HASC-SF Hearing on President's Fiscal Year 2020 Budget Request for Nuclear Forces

Mr. David J. Trachtenberg

Deputy Under Secretary of Defense for Policy

March 28, 2019

Chairman Cooper, Ranking Member Turner, and distinguished Members of the Committee, thank you for the opportunity to testify on the President's Fiscal Year 2020 Budget Request for nuclear forces and our nuclear posture.

Today, the United States faces an extraordinarily complex and dangerous global security environment, in which the central challenge to our prosperity and security is the reemergence of long-term strategic competition with China and Russia, which seek to overturn the long-standing rules-based international order and change territorial borders.

This is acknowledged in the 2018 *National Defense Strategy*, which also notes that rogue regimes such as North Korea and Iran are destabilizing regions through their pursuit of nuclear weapons or sponsorship of terrorism.

And, while we are hopeful for a peaceful denuclearization of the Korean Peninsula, North Korea continues to pose a threat to the U.S. Homeland, as well as our allies, and Iran seeks to establish itself as the dominant regional power in the Middle East, restrict our access, support proxies, and sow violence throughout the region.

For decades, the United States led the world in efforts to reduce the role and number of nuclear weapons. Successive treaties enabled reductions in accountable strategic U.S. nuclear warheads, first to 6,000, and ultimately to 1,550. Thousands of shorter-range nuclear weapons not covered by any treaty were almost entirely eliminated from the U.S. nuclear arsenal. Overall, the U.S. nuclear weapons stockpile has drawn down by more than 85 percent from its Cold War high.

Unfortunately, Russia and China have chosen a different path and have increased the role of nuclear weapons in their strategies and actively increased the size and sophistication of their nuclear forces.

For this reason, a robust and modern U.S. nuclear deterrent helps ensure the United States competes from a position of strength and can deter nuclear attack and prevent large-scale conventional warfare between nuclear-armed states for the foreseeable future.

The Nuclear Threat

The 2018 *Nuclear Posture Review* (NPR) reflects DoD's strategic priority to maintain a safe, secure, survivable and effective nuclear deterrent. The NPR examined the challenges posed by Russia, China, North Korea and Iran in order to recommend a nuclear force posture adequate to deter aggression by these and other countries.

Russia

Russia continues to prioritize high levels of defense spending to upgrade its nuclear forces and pursue advanced weapons specifically designed to counter U.S. military capabilities. Russia's nuclear modernization program covers every leg of its strategic triad and includes advanced modern road-mobile and silo-based intercontinental ballistic missiles (ICBMs), new submarine-launched ballistic missiles (SLBMs), and long-range strategic bombers. According to Russia's TASS News Agency, Russian Minister of Defense Sergei Shoigu announced on February 21, 2017 that 90 percent of the country's strategic nuclear forces will be armed with modern weaponry by 2020.

In March 2018, only a month after the United States and Russia reached the limits on strategic systems established under the New START Treaty, President Vladimir Putin announced that Russia is actively testing five new nuclear weapons capabilities, which include: 1) an intercontinental-range, nuclear armed hypersonic glide vehicle; 2) a maneuverable, nuclear-armed air-launched ballistic missile; 3) a long-range, nuclear-powered cruise missile; 4) a nuclear-powered, nuclear-armed underwater unmanned vehicle; and 5) a new heavy intercontinental range ballistic missile, called the SARMAT. President Putin, during this same speech, also announced that Russia developed new laser weapons systems "that have been supplied to the troops since last year."

This past February (2019), President Putin declared that Russia had successfully tested nuclear-propulsion engines that would allow the nuclear-tipped cruise missiles and underwater drones to travel for unlimited distances and evade traditional defenses. Some of these weapons would not be subject to the New START Treaty's central limits and verification regime as they exist today.

On top of all of this, Russia is modernizing and expanding an active stockpile of approximately 2,000 nonstrategic nuclear weapons—often referred to as tactical nuclear weapons—that can be deployed on ships, bombers, and tactical aircraft, and with ground forces. None of these are limited by any arms control treaty. In contrast, the United States forward deploys to Europe small number of just one type of nonstrategic nuclear weapon—the B61 nuclear gravity bomb—which is delivered by a dual-capable tactical aircraft. Both the B61 and its delivery aircraft are being modernized, but not increased in number.

Russia's military doctrine emphasizes the coercive nature and military value of nuclear weapons. During its military operation against Crimea, Russia raised the alert level of its nuclear forces and issued veiled nuclear threats to ensure the West did not intervene. Russia has repeatedly brandished its nuclear sword towards our NATO Allies in recent years. This past July, Russian President Putin issued an edict that "in conditions of a military conflict, demonstration of readiness and determination to use force by employment of a nonstrategic nuclear weapon is an efficient deterrence factor." And, more recently, in his annual state-of-the-nation address on February 20, 2019, Putin said that, if Washington deployed intermediate-range missiles in Europe, Moscow would not only target the countries hosting the U.S. weapons but the United States itself.

China

China continues its expansive military modernization and remains centrally focused on establishing regional dominance and expanding its ability to coerce U.S. allies and partners.. Consistent with a military strategy that stresses “optimization of its nuclear force structure,” China is modernizing and rapidly expanding its already considerable nuclear forces, with little to no transparency regarding the scope and scale of its nuclear modernization program. China is the only P-5 country that has not announced publicly the size of its nuclear arsenal, and has rebuffed multiple U.S. attempts to engage in a meaningful bilateral dialogue on nuclear posture and risk reduction issues.

China is developing a new generation of mobile missiles, with warheads consisting of multiple independently targetable reentry vehicles (MIRVs) and penetration aids. In particular, China has developed a new road-mobile strategic ICBM and its most advanced ballistic missile submarine armed with new submarine-launched ballistic missiles (SLBM).

China has also announced development of a new nuclear-capable strategic bomber, indicating China’s intent to develop a nuclear triad and has deployed a nuclear-capable precision guided DF-26 intermediate-range ballistic missile capable of attacking land and naval targets. China also tested a hypersonic glide vehicle in 2014.

China’s nuclear forces include a mix of strategic-range systems capable of striking the homeland as well as theater-range forces capable of threatening allies, U.S. bases, and forces in the region. As China’s capabilities both diversify and improve, there is risk China may perceive that these weapons provide it with coercive options in a crisis or conflict. China’s modernization is alone troubling, but the lack of transparency combined with growing Chinese assertiveness in the region is one of the most serious risks to regional stability in the Indo-Pacific.

North Korea

North Korea’s nuclear capabilities pose a potential threat to our allies and the U.S. homeland and add to an already complex strategic picture. North Korea has conducted six increasingly sophisticated nuclear tests and three ICBM flight tests that demonstrate its ability to strike the U.S. homeland. Although we remain hopeful that negotiations may produce a pathway to peace and denuclearization, we must also remain vigilant and maintain a strong deterrence posture.

Policy

The 2018 Nuclear Posture Review reflects the Department of Defense’s strategic priority to maintain a safe, secure, survivable and effective nuclear deterrent. Nuclear forces are the ultimate foundation of our nation’s security. Our deterrent forces must be modernized to remain credible—delay is not an option.

The highest U.S. nuclear policy and strategy priority are to deter potential adversaries from nuclear attack of any scale against the United States or its allies and partners. However, deterring nuclear attack is not the sole purpose of nuclear weapons. Given the diverse threats and profound uncertainties of the current and future threat environment, U.S. nuclear forces play the following critical roles in U.S. national security strategy:

- Deterrence of nuclear and non-nuclear attack;

- Assurance of allies and partners;
- Achievement of U.S. objectives if deterrence fails; and
- Capacity to hedge against an uncertain future.

Effective U.S. deterrence of nuclear attack and non-nuclear strategic attack requires ensuring that potential adversaries do not miscalculate regarding the consequences of nuclear first use, either regionally or against the United States itself. They must understand that the costs far outweigh any perceived benefits from non-nuclear aggression or limited nuclear escalation.

Declaratory Policy

U.S. nuclear declaratory policy is consistent with longstanding precepts that “the United States would employ nuclear weapons only in extreme circumstance to defend the vital interests of the United States, allies and partners.” The 2018 Nuclear Posture Review (NPR) clarifies that the “extreme circumstances” that may lead the United States to consider nuclear use, include, but are not limited to: significant non-nuclear strategic attacks on U.S., allied, or partner civilian population or infrastructure; and significant non-nuclear strategic attacks on U.S. or allied nuclear forces, their command and control, or warning and attack assessment capabilities. This clarification is intended to reduce the possibility of adversary miscalculation.

The 2018 NPR further states: “The United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations.”

No-First Use

The United States has a long-standing policy of constructive ambiguity regarding U.S. nuclear employment that has deterred potential adversaries from nuclear coercion or aggression since the advent of the nuclear age. A policy of “no-first-use” would undermine U.S. extended deterrence and damage the health of our alliances because it would call into question the assurance that the United States would come to the defense of allies in extreme circumstances. “No-first-use” is highly unlikely to be believed by our adversaries but, even if it were, it is more likely embolden them to test what they might perceive as weakened U.S. resolve to defend our allies and vital interests with every means at our disposal than it is to promote peace. Finally, a no-first use policy could undermine U.S. nonproliferation objectives if allies and partners felt the need to develop or possess their own nuclear weapons to deter potential adversaries.

Posture

The policies set forth in the 2018 NPR reaffirmed the conclusions of previous Republican and Democratic administrations that the diverse capabilities of the nuclear triad provide the flexibility and resilience needed for deterrence in the most cost-effective manner. Each triad leg is essential, complementary, and critical to ensuring no adversary believes it can successfully employ nuclear weapons for any reason, under any circumstances.

Unfortunately, each leg of the triad is now operating far beyond its originally-planned service life. Over the past 25 years, the United States made only modest investments in basic nuclear

sustainment, life-extension, and operations. Most of the nation's nuclear delivery systems, built in the 1980s and prior, will reach their end-of-service life in the 2025-2035 timeframe and cannot be sustained further. If not recapitalized, these forces will age into obsolescence. Our choice is not between replacing our Cold War systems or keeping them, but between replacing them or losing them altogether. Similarly, the DOE/NNSA infrastructure has long been underfunded and overdue for the upgrades necessary to create a modern, efficient nuclear complex to meet the nation's national security missions. DoD relies on the continued investment in recapitalization of DOE/NNSA's laboratories, production and test facilities.

Consequently, we must not delay the recapitalization of the triad and our nuclear command, control, and communications (NC3) system initiated by the previous Administration. The Fiscal Year (FY) 2020 Budget Request funds all critical Department of Defense (DoD) modernization requirements, helping to ensure that modern replacements will be available before the Nation's legacy systems reach the end of their extended service lives. The FY 2020 Budget Request for nuclear forces is \$24.9 billion or roughly 3.5 percent of the DoD budget. This includes \$8.4 billion for recapitalization programs (including the B-21, ground-based strategic deterrent (GBSD) ICBM, the long-range standoff (LRSO) cruise missile, and the Columbia-class nuclear ballistic missile submarine (SSBN)) and \$16.5 billion to sustain and operate our nuclear forces.

DoD's FY 2020 request to recapitalize the nuclear enterprise is about 1.2 percent of the total DoD budget request. Over the long term, nuclear force modernization will cost approximately \$320 billion over 23 years. Recent estimates, such as those from the 2018 Nuclear Posture Review, project that the total cost to sustain and modernize U.S. nuclear forces will account for about 6.4 percent of the Defense budget at its highest level of funding in 2029, returning to about 3 percent for sustainment upon completion of modernization. The January 2019 Congressional Budget Office report supports DoD's estimates concluding that the estimated cost of nuclear forces "is projected to rise from about 5% in 2019 to about 7% in 2028."

Finally, in support of modernizing these strategic systems, the bipartisan National Defense Strategy Commission concluded in its 2018 *Providing for the Common Defense* report that "Given the criticality of effective U.S. nuclear deterrence to the assurance of allies, and, most importantly, the safety of the American people, there is no doubt that these programs are both necessary and affordable."

Supplemental Capabilities

The 2018 Nuclear Posture Review concluded that the United States must supplement its existing stockpile with two modest capabilities to ensure Russia, China, and others do not perceive a gap in our regional deterrence posture. This is intended to discourage adversaries from limited nuclear attacks—strengthening deterrence and helping prevent conflict in the first place. By modifying a small number of existing SLBM warheads to provide a low-yield option and restoring a modern nuclear sea-launched cruise missile to the force, the U.S. will have credible response options to nuclear attacks of any magnitude. The low-yield SLBM warhead and nuclear-armed sea-launched cruise missile (SLCM) are measured responses to close troubling gaps in regional deterrence that have emerged in recent years. In addition, redeploying a SLCM addresses the enormous disparity in nonstrategic nuclear forces, without attempting to match Russia system for system. Both systems complement existing capabilities in the triad by providing assured, tailored options in the face of increasingly advanced air and missile defenses.

In addition, the unique attributes of a nuclear SLCM may incentivize Russia to accept constraints on its nonstrategic nuclear capabilities.

Moreover, the supplemental capabilities do not require nuclear testing or developing new nuclear weapons. They do not violate any arms control treaties or other international obligations, and they do not lower the threshold for nuclear use. They are intended to raise Russia's threshold (or likelihood) for employing nuclear weapons by convincing Russia that it would gain no advantage in using low-yield nuclear weapons.

NATO, Japan and Republic of Korea Engagements

The United States continues to extend nuclear deterrence commitments to assure allies in Europe and the Asia-Pacific region. Based on our long-shared common values and interests, this commitment helps address allied concerns with regional threats, such as Russia's nuclear and non-nuclear capabilities and aggressive rhetoric; China's assertiveness; and North Korea's nuclear and non-nuclear threats.

The United States exhibits its commitment to extended deterrence in two ways: first, it maintains the capabilities necessary to deter and, if necessary, to respond decisively across the spectrum of potential nuclear and non-nuclear scenarios that could affect our allies and partners; and second it sustains regular allied dialogues to facilitate understanding of each other's threat perceptions and to determine how best to demonstrate our collective capabilities and resolve.

Within NATO, we continue to participate in the Nuclear Planning Group and the High-Level Group, which our Assistant Secretary for Strategy, Plans and Capabilities chairs. As NATO Allies reiterated in Brussels last July, as long as nuclear weapons exist, NATO will remain a nuclear alliance. The Alliance's deterrence posture continues to depend upon both U.S. strategic nuclear forces and forward deployed nuclear gravity bombs with U.S. and allied dual-capable aircraft.

In the Indo-Pacific region, the United States maintains formal extended deterrence dialogues with Japan—the U.S.-Japan Extended Deterrence Dialogue (EDD)—and with the Republic of Korea (ROK) (e.g. U.S. ROK Deterrence Strategy Committee (DSC)). Through regular bilateral meetings, allied site-visits to locations of U.S. strategic capabilities, and table-top exercises, both the EDD and DSC have helped us to develop a common Alliance understanding of deterrence principles, and to test application of those principles to scenarios we may face in the Indo-Pacific region. These dialogues contribute to alliance cohesion and effectiveness and help affirm to our allies that they should not doubt our extended deterrence commitments or our ability and willingness to fulfill them.

Intermediate-range Nuclear Forces (INF) Treaty Developments

On February 2, 2019, after years of Russian cheating on its Intermediate-Range Nuclear Forces (INF) Treaty obligations, and after exhausting every reasonable diplomatic, economic, and military effort to persuade Russia to comply with its treaty obligations, the United States suspended its obligations under the INF Treaty and gave notice of the U.S. intent to withdraw from the Treaty. As NATO Secretary General Jens Stoltenberg asserted, "Russia is in material breach of the INF Treaty and must use the next six months to return to full and verifiable

compliance or bear sole responsibility for its demise.” Allies fully support the U.S. decision to suspend its obligations under INF and the U.S. intent to withdraw from the Treaty.

To be clear, what prompted the U.S. suspension was not a technical violation or an interpretive difference, but Russia’s development, testing, and fielding of a ground-launched cruise missile system specifically banned by the INF Treaty. For those concerned that our suspension will cause Russia to develop these systems further, I can only say Russia’s legal obligations under the INF Treaty proved no barrier to its pursuit and fielding of a banned system in the first place. To assert that Russia is reacting to our suspension is to ignore the reality of Russia’s conduct under the INF Treaty.

As the President stated in February 2019, the United States is moving forward with developing ground-launched missile capabilities. This is a direct consequence of Russia’s violation of the INF Treaty. Now that our Treaty obligations are suspended, we are beginning work that if pursued to completion would be inconsistent with the Treaty. The United States is developing systems that are conventional in nature, and this work is designed to be reversible should Russia return to compliance by verifiably destroying its INF Treaty-violating missiles, launchers, and associated equipment. This development will include flight tests, although we do not anticipate progressing to this stage before the United States’ withdrawal from the Treaty takes effect on August 2. What sort of system we ultimately develop will be driven by our assessment of military requirements and in consultation with Congress and with our allies and partners.

The New START Treaty

As stated in the 2018 Nuclear Posture Review, the United States is committed to arms control efforts that advance U.S., allied, and partner security; are verifiable and enforceable; and include partners that comply responsibly with their obligations. As both the 2018 NPR and the 2018 NATO Brussels Summit Communique noted, we must take account of the prevailing international security environment. In the arms control context, this means Russia and, increasingly, China.

While Russia is in compliance with New START, I will not recount here Russia’s many violations of its treaty obligations and other political commitments. It is instructive, however, that, only a month after the United States and Russia reached the central limits on strategic nuclear systems prescribed by the New START Treaty, President Putin—with great fanfare—announced Russia was developing new long-range nuclear delivery systems, some of which would not be limited by the New START Treaty. This is troubling given that Russia is also modernizing its growing and increasingly capable arsenal of shorter-range, nonstrategic nuclear weapons, which are also not covered by New START. Members of this Committee will remember that Russia’s nonstrategic arsenal was of great concern when the New START Treaty was ratified, and it remains a concern today.

That said, the Department supports pursuing a prudent arms control agenda, which could include extending the New START Treaty, provided the outcomes improve the security of the United States and our allies and partners, and effectively help manage strategic competition among states.

Conclusion

Mr. Chairman, let me conclude by stating that nuclear deterrence is the bedrock of U.S. national security. The U.S. nuclear deterrent must dissuade any adversary from mistakenly believing it can benefit from using nuclear weapons—even in a limited way—against the United States or its allies and partners.

Our nuclear deterrent underwrites all U.S. military operations and diplomacy across the globe—it is the backstop and foundation of our national defense. A strong nuclear deterrent also contributes to U.S. nonproliferation goals by eliminating the incentive for allies to have their own nuclear weapons.

In an increasingly complex and threatening security environment, we must make the investments needed to address the on-going atrophying of our nuclear capabilities and ensure we have the capabilities, now and in the future, to deter and defend against attacks on our homeland, U.S. forces deployed abroad, and allies and partners.

I urge the Committee to support the important nuclear programs and funding contained in the President's FY 2020 Budget Request.

Thank you again for the opportunity to testify. I look forward to your questions.

David J. Trachtenberg
Deputy Under Secretary of Defense for Policy

Mr. David J. Trachtenberg was confirmed by the U.S. Senate on October 17, 2017 as Deputy Under Secretary of Defense for Policy. He has more than 35 years of public policy experience in the private sector and the Executive and Legislative branches of government.

Prior to his confirmation, Mr. Trachtenberg served as President and Chief Executive Officer of Shortwaver Consulting, LLC, a national security consultancy. From 2005-2007 he was a Vice President of CACI International and served from 2003-2005 as Senior Vice President for Homeland Security and Senior Vice President for Corporate Support at National Security Research, Inc.

From 2001-2003, Mr. Trachtenberg was Principal Deputy Assistant Secretary of Defense for International Security Policy, with responsibility for issues relating to NATO, Europe, Russia and Eurasia, technology security, counterproliferation, missile defense, nuclear forces, and arms control. During this period, he also served as Acting Deputy Assistant Secretary of Defense for Forces Policy, overseeing the office responsible for the Nuclear Posture Review and providing policy rationale leading to the withdrawal from the Anti-Ballistic Missile Treaty and deployment of an initial national missile defense capability. He headed numerous interagency delegations abroad in support of the President's direction to encourage international cooperation on missile defense, leading discussions with the Russian Federation on this topic. From 1995-2001, he was a Professional Staff Member on the House Armed Services Committee.

In 2003, Mr. Trachtenberg was awarded the Department of Defense Medal for Distinguished Public Service, the highest honorary award presented by DOD to private citizens.

Mr. Trachtenberg received a Bachelor of Arts degree in International Relations from the University of Southern California and a Master of Science degree in Foreign Service from Georgetown University. He is widely published and was an adjunct professor in Missouri State University's Defense and Strategic Studies program.

HOUSE COMMITTEE ON ARMED SERVICES

STATEMENT OF
JOHN E. HYTEN
COMMANDER
UNITED STATES STRATEGIC COMMAND
BEFORE THE
HOUSE COMMITTEE ON ARMED SERVICES
28 MARCH 2019

HOUSE COMMITTEE ON ARMED SERVICES

INTRODUCTION

USSTRATCOM is a global warfighting command. My command priorities have not changed during my time as Commander. They remain: (1) above all else, provide strategic deterrence for the Nation and assurance of the same to our allies and partners, (2) if deterrence fails, be prepared to deliver a decisive response, and (3) do this with a combat-ready force. The 162,000 men and women who make up USSTRATCOM are resilient, equipped, and ready thanks to your continued support. Budget stability over the past year was extremely important and had a positive impact on both our modernization efforts and our overall readiness.

As part of the Joint Force, USSTRATCOM is responsible for Strategic Deterrence, Nuclear Operations, Global Strike, Space Operations, Joint Electromagnetic Spectrum Operations, Missile Defense, and Analysis & Targeting. To execute our assigned missions, the Soldiers, Sailors, Airmen, Marines, and civilians of the command operate globally across the land, sea, air, and space. Our forces and the strategic deterrence they provide underpin and enable all Joint Force operations and are the ultimate guarantors of national and allied security.

The foundation that enables our strategic deterrence is the triad: nuclear-armed Intercontinental Ballistic Missiles (ICBMs), Submarines, and Bombers. A powerful, ready triad remains the most effective way to deter adversaries from conducting strategic attacks against the United States and allies. Its credibility backstops all U.S. military operations and diplomacy around the globe and ensures that tensions – regardless of where or how they arise – do not escalate into large-scale war.

However, as all the elements of the triad age beyond their planned service life, we must continue to execute our planned modernization strategy to maintain an effective deterrent. We require a robust and ready nuclear arsenal for the foreseeable future. This will remain the case until the myriad of legacy and emerging nuclear threats are reduced or eliminated. Unfortunately, the opposite is occurring.

Deterrence is created by much more than the 1,550 New START treaty-accountable deployed nuclear weapons and 700 deployed strategic delivery platforms. Today, our mission to deter major power conflict dictates we field ready, capable, and lethal forces, tailored to adaptive adversaries. Continued success means integrating the full range of missions in all domains and without geographic boundaries. We are increasingly integrating our planning and Tier 1 exercises to remove seams between global and geographic combatant commands. We are pursuing approaches to enhance real world planning and execution of globally integrated fires to best deliver the most effective capabilities and effects when and where needed.

The United States must never put our ability to deter in jeopardy. Our missions, capabilities, and forces must continue to be an integral part of our overarching national security posture. Therefore, to continue to provide the security our Nation deserves, we must clearly identify the threats we face, develop

strategies to deter those threats, and ensure we have the required capabilities for decisive response if deterrence fails. Only with continued Congressional support, can this remain the case.

GLOBAL SECURITY ENVIRONMENT

The National Defense Strategy describes the increasingly complex global security environment in which we live. We characterize today's environment by the re-emergence of long-term, strategic competition between nations and overt challenges to the free and open international order. Although an era of great power competition is again a reality, that does not mean conflict is inevitable. It means we must continue investing in strength to preserve the peace.

It is increasingly apparent that China and Russia want to shape a world consistent with their authoritarian models – gaining veto power over global economic, diplomatic, and security decisions – seeking dominance within their perceived regional spheres of influence, and expanding their global reach.

For over two decades, China and Russia have studied the American way of warfare; observing first-hand how we train and fight. They now understand the advantages we gain from integrating capabilities across all domains to accomplish strategic objectives. To counter our dominance, China and Russia are actively seeking to exploit perceived vulnerabilities and are directly challenging us in areas of long-held strength. Their development of asymmetric capabilities across all-domains is not meant to challenge single aspects of our deterrence strategy; rather, their advancements in technology, strategy, tactics, and doctrine aim to invalidate our entire deterrence strategy.

CHINA

China continues to challenge the existing rules-based international order. It is advancing a comprehensive modernization program aimed at making the People's Liberation Army a world-class military. This program includes the continued development and deployment of a nuclear triad, combined with anti-access/area denial (A2/AD) and power projection operations. They are also pursuing advancements in offensive hypersonic strike weapons, advanced robotics, quantum computing, and artificial intelligence through a combination of research and development, forced transfer of intellectual property, and outright cyber theft.

Additionally, China's maturing military space capabilities in intelligence, surveillance, and reconnaissance, satellite communications, satellite navigation, meteorology, and robotic space exploration present growing challenges in space. With their focus on counter-space capabilities, China is pursuing a strategy of denying the United States the advantage of space-based systems during crises and conflicts.

Once locked away in intelligence channels, news outlets are beginning to note specific threats to our space systems. January marked 12 years since China publicly tested its direct-ascent system, in which it destroyed one of its own satellites and created thousands of pieces of debris. This 2007 test demonstrated to the world that China is capable of destroying any satellite in low earth orbit, including many of our intelligence and communications spacecraft. Today, China has an operational ground-based anti-satellite missile intended to target low-earth orbit satellites and are pursuing numerous other capabilities. These developments, coupled with China's lack of transparency on nuclear policies, force disposition, and weapons and their growing assertiveness to challenge the existing free and open international order undermines regional and global stability. Further, these actions seek to erode the U.S. standing in Asia.

RUSSIA

Russia continues to conduct malign activities that negatively impact U.S. interests. Their invasion and attempted annexation of the Crimean Peninsula, destabilizing eastern Ukraine, intervening on behalf of Syrian President Bashar al-Assad, and shaping the information environment to suit Russian interests, pose a major challenge to the United States and NATO. Russia's military doctrine emphasizes the potential coercive and military uses of nuclear weapons. It mistakenly assesses that the threat of nuclear escalation or actual first use of nuclear weapons would serve to "de-escalate" a conflict on terms favorable to Russia. These mistaken perceptions increase the prospect for dangerous miscalculation and escalation.

As far back as 2006, Russia committed to modernizing and adding new military capabilities to its nuclear forces and upgrading its strategic nuclear triad. Today, Russia has completed roughly 80 percent of their modernization goals. As part of this program, Russia is upgrading to modern road-mobile and silo-based ICBMs, increasing ballistic missile submarine reliability and stealth, fielding new Submarine Launched Ballistic Missiles (SLBMs), Submarine Launched Cruise Missiles (SLCMs), and modernizing its fleet of long-range strategic bombers, to carry nuclear and conventionally-armed air-launched cruise missiles. Russia is also developing and intends to deploy novel strategic nuclear weapons, like its nuclear-armed, nuclear-powered underwater unmanned vehicle and intercontinental-range cruise missile, which Russia seeks to keep outside of existing arms control agreements.

Russia is also pursuing nuclear-armed hypersonic missiles and nuclear-capable cruise missiles, which when coupled with their newest intercontinental range ballistic missiles, improves upon its capability to attack anywhere on the globe with little or no notice. Additionally, their production of a new fifth generation bomber expected within the decade will enhance their ability for long-range deployment.

Russia's material breach of the Intermediate-range Nuclear Forces Treaty also remains a significant concern, as demonstrated by their deployment of a treaty-violating system, the SSC-8 ground-

launched cruise missile, multiple battalions of which have been fielded as of late 2018, and illustrates Russia's broader pattern of malign behavior and willingness to disregard negotiated agreements when they believe it is in their interest. Finally, Russia has an active stockpile up to 2,000 Non-Strategic Nuclear Weapons (NSNWs), which are not accountable under the New START Treaty. These include air-to-surface missiles, short-range ballistic missiles, gravity bombs, and depth charges for medium-range bombers, tactical bombers, and naval aviation, as well as anti-ship, anti-submarine, and anti-aircraft missiles and torpedoes for surface ships and submarines, and Moscow's antiballistic missile system.

Russia's diverse and flexible NSNW capabilities facilitate a doctrine that envisions the potential coercive use of nuclear weapons. Combined with its large nuclear weapons infrastructure and ready production base, this underscores Moscow's commitment to having nuclear weapon underpin its security and commitment to maintaining its nuclear forces for the indefinite future. Their doctrine of coercive use further enhances their ability to challenge the United States and NATO across the full spectrum of political, diplomatic, military, and information warfare.

NORTH KOREA AND IRAN

North Korea and Iran remain threats but not to the same degree as China and Russia. Both North Korea and Iran retain large arsenals of short- and medium-range ballistic missiles and are threats to regional stability. North Korea has tested ICBM-class missiles designed to range the United States. However, the Department of Defense is working actively to reduce military tensions and remains in full support of our diplomats as they work to achieve the final, fully verified denuclearization of the DPRK. Iran remains the world's leading sponsor of terror and continues its malign influence and destabilizing activities across the region. None of these activities are helpful or supportive of peace and stability, and all introduce greater risk to an already complex and volatile environment. In both instances, we remain vigilant to the threats they pose to the United States, our allies and partners, and support the on-going international and whole-of-government approaches to reduce these threats peacefully.

STRATEGIC DETERRENCE

Strategic deterrence has underwritten our Nation's security and preserved our way of life since the end of World War II. While the fundamental principles of deterrence remain constant, the 21st Century landscape is profoundly different. We can no longer focus on countering a single adversary with traditional means. Peer adversaries are aggressively pursuing outright theft of intellectual property, demonstrating willingness to corrupt supply chains, and are exploiting rapid advancements in disruptive technologies in destabilizing ways. These actions provide China and Russia, in particular, advanced strategic capabilities to threaten the United States and marginalize our global influence. This requires us to rethink how we continue to deter new types of strategic attacks.

The mission of our Nation's strategic forces of the last 73 years endures: to deter major attacks against the United States and if necessary employ strategic forces to defeat an ever-changing adversary. Effective command and control, that supports global integration, is a necessary and critical element.

The 2018 National Defense Strategy states the Department of Defense (DoD) "will modernize the nuclear triad – including Nuclear Command, Control, and Communications (NC3), and supporting infrastructure." Thanks to Congressional support and timely budgets, we are making solid progress modernizing these weapon systems. However, to fully realize the capabilities of a modernized triad we require an NC3 architecture responsive to evolving threats and able to adapt to technology innovations. Speed is essential. We are beginning to move faster, but we are still not moving fast enough. Our most critical weapon systems must deliver on time or early. The Services are making progress and I appreciate their efforts, but we must continue to strive for more timely, affordable programs. We must recapture the ability of our nation to go fast, faster than all potential adversaries, in order to maintain an effective deterrent.

Going fast means that we return to the dynamic that made us the strongest most technologically advanced military in the world. Over my nearly 38 years of military service I have watched as we collectively developed an increasingly unhealthy expectation of removing all risk from everything we do. Admiral Hyman Rickover, the father of the Nuclear Navy once said, "Success teaches us nothing, only failure teaches." We seem to have forgotten this principle. Although success is the ultimate goal, we must accept some healthy failures along the way. Today, however, we seem to reward and promote people at all levels for never failing, subconsciously creating a collective mindset to maintain the status quo at all costs. The best way to never fail is to never try, or to try only when success is certain – which means we punish those who aggressively take risks. If we continue this trend, we will eventually fall behind our competition. In 1991, the United States had the only superpower-class military, and status quo at that time favored us greatly. We still have an advantage, but that advantage is shrinking. I appear before you today fully confident in our ability to preserve the peace and dominate any conflict. But without change – unless we recapture the ability to take intelligent risk – a future USSTRATCOM commander, a decade or so from now, may sit before you and not be able to make the same statement. This could put our whole nation at greater risk.

To emphasize that point – today, our forces are still dominant, the finest in the world, yet they are equipped with many of the exact same weapon systems fielded during the Cold War, including the triad and our NC3 capabilities. Moreover, our competitors are moving fast – particularly in the area of their strategic forces. Status quo no longer favors us; however, our underlying personnel, budgeting, and acquisition structures evolved since the end of the Cold War to preserve the status quo. This must change. We must counter this situation with ruthless determination to reward and promote thoughtful risk

management aimed at applying innovative technologies and new business practices. We must improve our ability to protect our nation's commercial sector where innovation thrives. We must move fast in space, in cyber, in all our strategic systems – to once again regain the advantage.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS

Our NC3 system is ready, reliable, and effective at meeting today's strategic deterrence requirements. However, to meet the evolving threat, advances in technology, and to prepare for a modernized triad we must update our NC3 system now. Our current legacy system reflects the needs of the Cold War, focused primarily on Soviet-era ballistic missile and bomber threats. The next generation NC3 architecture must maintain and even improve on the readiness and reliability of today while also dealing with the myriad of new threats from our potential adversaries. As we transition to a modern threat-based NC3 enterprise architecture and address the growing cyber, asymmetric, and kinetic challenges, we must ensure positive command and control of U.S. nuclear forces at all times, even under the enormous stress of a nuclear attack. Getting this right and doing so quickly is one of my top priorities.

The next generation NC3 architecture requires an innovative approach tightly linking mission needs, requirements, acquisition, and funding strategies to deliver capability on operational and threat-relevant timelines. We must transform the enterprise to operate with speed and agility, fully leveraging rapid prototyping and experimentation, to innovate and outpace the threat. We must continually change while maintaining predictability for the user. This is a challenging task and once defined must be consistently resourced.

The 2018 Nuclear Posture Review (NPR) identified a range of initiatives to ensure our NC3 capability remains survivable and effective in crisis. Among these initiatives is reforming NC3 governance due to the broad diffusion of authority and responsibility within the Department. On 03 Oct 2018, the Secretary of Defense designated the Deputy Secretary of Defense and Chairman of the Joint Chiefs of Staff accountable for all NC3 related activities. Under this new governance structure, the Commander of USSTRATCOM is the NC3 Enterprise Lead responsible for NC3 enterprise operations, requirements, and systems engineering and integration, while the Under Secretary of Defense for Acquisition and Sustainment (USD (A&S)) serves as NC3 Capability Portfolio Manager (CPM). We have codified NC3 governance roles and responsibilities, taken concrete steps to sustain the current NC3 architecture with selective modernization, and are moving forward to design and field the next generation NC3. This was a necessary step to place the authorities under one commander, and I am already moving forward in that role.

To execute these new responsibilities, we are well on our way to establishing the NC3 Enterprise Center (NEC) at USSTRATCOM and are on track to achieve initial operational capability this year. The NEC will improve mission effectiveness and efficiency while defining future NC3 capability requirements. The NEC will also establish core NC3 operational concepts as the basis for aligning the right mix of multi-domain capabilities necessary to execute the Nuclear Command and Control mission and achieve strategic deterrence objectives. Essential to this work, is the ability to direct enterprise-level systems engineering and integration activities. Working with the Director, Defense Information Systems Agency (DISA), the Joint Systems Engineering and Integration Office is now aligned to the NEC and receives operational direction and work prioritization from me.

To support the NEC, USD (A&S) as the NC3 CPM will oversee and advise on NC3 enterprise acquisition and resources. The NEC and USD (A&S) team will provide comprehensive enterprise-level understanding of operational risk, margin and investment priorities as we envision, design and field the next generation NC3 in partnership with our service and agency leads.

To ensure we remain aligned, responsive and relevant, the NC3 enterprise must have dedicated operational and intelligence resources to rapidly identify, understand, and anticipate current and future evolving threats to the NC3 enterprise. To satisfy this need and concurrently address Section 1655 of the FY 2018 National Defense Authorization Act (NDAA), PL 115-91, USSTRATCOM, in coordination with the Office of the Director for National Intelligence, is establishing an NC3 Intelligence Fusion Center within the USSTRATCOM Intelligence Directorate. This initiative will facilitate aligning operations with intelligence expertise to enhance future NC3 architecture security.

With the governance structure in place to address future needs, we will concurrently continue sustainment and operation of the existing NC3 enterprise. We have taken significant steps over the past year to improve service, agency, and nuclear command and control operations centers reporting to better understand operational risk and margin. This data will allow us to continue increasing the analytic rigor in our assessments and inform sustainment and modernization investment priorities.

In order to provide the Commander In Chief continuous communications and control of the nuclear forces, we are improving communications capabilities across all domains to ensure connectivity, enhanced conferencing, and decision support tools to the President. In the space domain, we continue to launch Advanced Extremely High Frequency (AEHF) satellites for integration into a combined Milstar/AEHF communications constellation. The AEHF satellites, using the eXtended Data Rate (XDR) waveform, coupled with requisite ground node and airborne platform Family of Advanced Beyond Line-of-Sight terminals (FAB-T) enable collaboration between the President and senior advisors under any circumstance and ensure connectivity with the nuclear forces.

In the air domain, the Air Force and Navy are executing an airborne platform Analysis-of-Alternatives for replacing existing E-4B National Airborne Operations Center, E-6B Airborne Command Post and Take Charge And Move Out (TACAMO), and C-32 Executive Transport fleets. Ongoing communications capability enhancements include Air Force programs to provide a Very Low Frequency (VLF) receiver for the B-2 bomber in 2020 and a replacement VLF receiver and AEHF-capable terminal for the B-52 bomber. These capabilities will provide resilient and robust worldwide connectivity lasting well into the next two decades.

Finally, in the land domain, the Air Force Global Aircrew Strategic Network Terminal program will deploy an AEHF terminal providing Air Force Wing Command Posts, Munitions Support Squadrons, and Mobile Support Teams with survivable ground-based communications to receive Presidential direction for relay to bomber, tanker and reconnaissance forces. This modernization initiative is essential to completing transition from legacy Milstar low data rate networks to AEHF extended data rate networks.

I am confident in the direction the Department has taken and the priority placed on modernization of the NC3 Enterprise as stated in the NPR. As the Enterprise lead, my command will aggressively move forward, ensuring a safe, secure, and reliable architecture is in place for years to come.

THE NUCLEAR TRIAD

Maintaining the planned modernization of our nuclear triad of ICBMs, SSBNs, and bombers with air delivered weapons remains the best approach to deterring potential adversaries and assuring our allies that we are committed to their security. Numerous reviews, including the 2018 NPR, validate the nuclear triad's importance in deterring Russia and China, providing operational flexibility, and dissuading other nations from pursuing their own nuclear weapon programs. With a credible and effective force and a supporting declaratory policy, our strategic competitors would be hard-pressed to believe they could attack the United States or our allies and achieve the benefits they seek.

A modernized triad provides both unique and complementary capabilities to address current threats and future uncertainty. Alert and always ready to respond, the ICBM force ensures no adversary, regardless of size, can be confident in the success of a preemptive attack. Our ICBMs create enormous targeting problems for our adversaries, requiring a massive raid that would be impossible to hide and would guarantee their own demise. With its range, payload, accuracy, and speed the ICBM is critical to our nation's deterrent strategy.

Our strategic bombers provide the President the most visible, flexible, adaptable, and recallable options to provide strategic deterrence. Should an emerging crisis arise, we can rapidly deploy our bombers to clearly communicate our resolve and commitment to our global security partners. With the

ability to provide a conventional or nuclear strike capability, the bomber force plays an indispensable role in our overall strategy.

Nuclear powered submarines with nuclear-armed ballistic missiles patrol the seas and provide a survivable response capable of holding targets at risk within hours. Their assured, survivable second-strike capability means that regardless of any attack, our adversaries will always face the possibility of a devastating response. The most survivable leg of the triad, it is also critical to our nation's strategic deterrent.

We continue to propose prudent investments in delivery system modernization programs across the triad. These modernization efforts improve our readiness, increase safety and security, and enhance our capabilities/credibility against the threats we face now and in the near future. Although some might consider these modernization plans expensive, I believe that America can afford survival. The only way to change our strategic deterrent is to convince our adversaries to reduce the threat. This is not occurring. China and Russia, in particular, are not only modernizing the traditional elements of their own triads, but are also building a myriad of additional nuclear capabilities to threaten the United States. Both nations employ and are modernizing silo-based ballistic missiles, submarines and bombers, and both are deploying large numbers of mobile ICBMs – which the US has chosen not to pursue. China and Russia are pursuing hypersonics as we are, but, in stark contrast, we have no plans to include them in our nuclear force structure. Russia is also building new intermediate range nuclear weapons, new cruise missiles, as well as new nuclear powered cruise missiles and torpedoes all to threaten the United States.

We continue to monitor and evaluate all these new threats. We did so in last year's NPR. In the NPR, we evaluated and discarded a course of action that would match and even exceed the capabilities of these adversaries. Our analysis showed that we could continue to deter any and all of these threats with a modernized triad augmented by a small number of low yield nuclear weapons deployed on our submarines and a measured sea launched cruise missile capability. Modernization of these capabilities is critical to our nation's defense. We don't have to match all the specific capabilities of our adversaries as long as our capabilities are robust enough to deter and if needed respond to any attack; this is why we need a triad augmented by some small numbers of supplemental capabilities. By pursuing these capabilities, we make sure that nuclear-armed adversaries do not falsely conclude there are reasonable benefits and acceptable costs to attacking the United States and our allies. Sustaining and modernizing the triad requires investment, but its contribution to peace and stability far outweigh the projected cost required to maintain a credible nuclear deterrent.

LAND-BASED STRATEGIC DETERRENT

The Minuteman III has served the country for over 45 years. Its high availability rate is testament to its robust design and the diligent efforts of the Airmen who operate and maintain the weapon system. The Air Force is committed, through such efforts as the Programmed Depot Maintenance and Airborne Launch Control System Replacement programs, to sustaining the Minuteman III ICBM through 2030. When the Minuteman III finally retires, it will have exceeded its initial 10-year service life by half a century. While still reliable, missile component and hardware attrition, coupled with the aging of 1960's era infrastructure, drive the requirement for a comprehensive weapon system replacement within the next decade. Further Minuteman III life extension is not cost effective nor will it provide a weapon system capable of adapting to advancing technology and changing adversary threats.

To maintain a viable land-based strategic deterrent capability, the Air Force must begin deploying the replacement Ground Based Strategic Deterrent (GBSD) by the late 2020s. We are working closely with the Air Force to ensure the GBSD is fully integrated into our modernized NC3 system and can adapt to an evolving and increasingly dynamic strategic environment. To ensure this, the Air Force is incorporating modularity and open system standards enabling future technology insertion. Additionally, to deliver GBSD on time and on budget, the Air Force is pursuing mature, low-risk technologies and working with other strategic partners to leverage investments that eliminate delays and reduce cost. When fielded, GBSD will be a capable and cost-effective ICBM able to deter potential adversaries and assure allies of our commitments to their security.

SEA-BASED STRATEGIC DETERRENT

The OHIO-class ballistic missile submarine's stout construction and pioneering maintenance program allowed it to be life extended from 30 to 42 years into the 2040s, making it the longest serving submarine in U.S. history. However, with no margin to extend the OHIO-class further, the COLUMBIA-class SSBN must field on time to avoid a deterrent capability gap in the triad. It is also essential that we maintain our technological advantage in this critical mission, and COLUMBIA will do just that. To this end, the Navy has elevated the COLUMBIA program to its top shipbuilding priority, leveraging other efforts and implementing advanced procurement to reduce risk and ensure it is ready for its first strategic deterrent patrol in 2031. We must continue to support our industrial partners and give appropriate prioritization to funding throughout the life of the program.

To avoid complex concurrent strategic weapon modernization programs, the Navy life extended the Trident II D5 ballistic missile to transition from OHIO to COLUMBIA. The Navy fielded the Trident II D5 over 25 years ago and is executing a life extension that will allow service into the early 2040s. In

the face of continuously evolving threats, we must begin the effort of designing a flexible and adaptable follow-on SLBM that allows rapid and cost effective modifications.

To ensure our nuclear posture is successful in deterring adversaries, the 2018 NPR directed near-term fielding of a small number low-yield ballistic missile (LYBM) warheads and pursuit of a modern nuclear-armed SLCM. These capabilities are necessary to our strategic deterrence mission and will serve to disabuse any adversary of the mistaken perception they can escalate their way to victory.

The LYBM has begun production and will serve to provide a timely counter to Russia's NSNWs, their doctrine of limited first-use in a large-scale conflict on Russian territory, and their perceived advantage in low-level nuclear conflict. The SLCM will help close deterrence gaps and provide a considerable degree of assurance to allies.

AIR-BASED STRATEGIC DETERRENT

The current bomber fleet and its associated weapon systems have already exceeded or are rapidly approaching the end of their intended service life. To preclude a strategic capability gap associated with these essential nuclear platforms, ongoing sustainment and planned modernization efforts must continue.

The B-52 remains the backbone of the strategic bomber force today and well into the future. It is the only platform capable of employing the nuclear AGM-86B Air-Launched Cruise Missile (ALCM) which provides a standoff capability while providing the President the flexibility to recall a strike if necessary. B-52s will remain in service until 2050. Until the B-52 is replaced, the Air Force will continue to upgrade the aircraft to ensure its long-term viability. Modernization of the 1950's-era engines, avionics, and weapons systems is essential for continued airborne strategic deterrence.

The B-2, the Nation's only penetrating bomber is also undergoing several critical modernization programs to maintain its survivability against advanced air defenses. Similar to the B-52, the B-2 recently received weapon systems and communication equipment updates to improve effectiveness and lethality.

The B-21 is the bomber of the future, ensuring we maintain a technical advantage against planned adversary advancements. Armed with both direct attack weapons to hold emerging targets at risk and cruise missiles to deny geographic sanctuaries to any adversary, the B-21 will deliver the right capabilities based upon the tactical situation. Like other modernization programs, it is critical the Air Force deliver the B-21 on time and on budget to assure we can meet deterrence objectives and global security commitments.

Complementing the Nation's strategic bomber force, the Long Range Standoff weapon (LRSO) will replace the aging ALCM and maintain a viable nuclear standoff capability that can hold targets at risk in an evolving threat environment.

Strategic bombers require reliable and robust tanker support to execute their strategic deterrence and nuclear operations missions. While the Air Force is committing significant resources to maintain the aging KC-135 tanker fleet, it is critical we deliver its replacement on time. The Air Force remains confident the KC-46 will deliver the required capabilities to support our strategic forces. It is imperative that KC-135 sustainment and KC-46 deliveries remain top priorities to ensure a credible air-delivered strategic deterrent.

Our NATO partners rely on the credible deterrent of deployed F-15, F-16, and PA-200 Dual Capable Aircraft (DCA) to provide regional assurance against aggression in Europe. The B61 nuclear gravity bombs deployed to NATO are over 30 years old and will be replaced by the life extended B61-12. By the mid-2020s, the F-35 will be available in Europe and capable of delivering the B61-12 into defended areas, maintaining the credibility of our deterrent capability and of the nuclear alliance. The on-time delivery of these capabilities and our continued commitment in support of NATO is a cornerstone of our deterrence and assurance objectives.

NUCLEAR WEAPON STOCKPILE AND SUPPORTING INFRASTRUCTURE

Today, our nuclear weapons are safe, secure, effective, reliable, and able to meet deterrence mission requirements. Much like the modernization efforts of our delivery systems, we must also take a hard look at the components that make up the warheads themselves. Ensuring the viability of the nuclear deterrent requires continued resourcing and sustained effort to address the increasing uncertainty and growing risk in our nuclear stockpile and enterprise.

The majority of weapons in today's stockpile have surpassed their intended design life, thereby accumulating increasing risk. The United States has reduced its stockpile by 25 percent since 2010, while some potential adversaries have increased their numbers of nuclear weapons and significantly modernized their nuclear capabilities. Potential adversaries are elevating strategic uncertainty with new capabilities, escalatory doctrines, and actions threatening our nuclear forces' effectiveness and credibility.

To address these challenges, the Nuclear Weapons Council (NWC) recently updated its long-range strategic plan to align with the National Security Strategy and the National Defense Strategy, and implement actions directed in the 2018 NPR. The strategic plan aligns the Department of Energy's National Nuclear Security Administration (NNSA) nuclear weapons modernization and infrastructure recapitalization activities with DoD nuclear delivery system replacement programs in support of deterrence and military requirements.

The NNSA recently celebrated important stockpile modernization milestones by completing the Navy's W76-1 ballistic warhead life extension program (LEP) and achieving first production of key components in the Air Force's B61-12 gravity weapon nuclear package. The Air Force and NNSA are

progressing with the LRSO missile and its associated W80-4 warhead to deliver required capabilities on schedule.

The next significant stockpile effort involves both Air Force and Navy ballistic missile warheads, the bulk of our deterrent force. While these weapons will not field until the 2030s, development activities need to start in earnest now in order to posture the enterprise for success. Starting now also provides expanded opportunities for the Navy and Air Force to collaborate and leverage investments to their mutual benefit.

None of the required stockpile surveillance, sustainment and modernization efforts will succeed without replacing key facilities and upgrading our aged nuclear infrastructure. Our present complex continues to accumulate serious risk due to atrophy and past lack of timely recapitalization. I visited all the design laboratories and production plants across the complex last year, and in too many cases the enterprise is operating at or near capacity or simply lacks the needed infrastructure. This results in little margin to execute planned work or respond adequately to an emergent technical issue. Options for future systems are constrained by design and production limitations. If not corrected with currently underway or planned investments, the complex's condition will place us at a strategic disadvantage.

The highest NNSA infrastructure priority is re-establishing a plutonium pit production and fabrication capacity to meet deterrent requirements. Our national requirement, supported by numerous studies and analyses, requires no fewer than 80 war-reserve pits per year by 2030. I support the NNSA plan to achieve this.

Additionally, critical infrastructure investments in uranium and tritium processing, lithium and non-nuclear component production, experimental facilities, and general supporting infrastructure are required. Shortcomings in these areas create operational risks to force readiness and our surge ability to respond to unforeseen technical issues or adversary advancements in their capabilities.

Along with recapitalizing our infrastructure, we must also recruit, train, and retain a qualified workforce to perform the highly specialized nuclear weapons work. The enterprise must enact a human resource strategy that identifies qualified candidates, fosters interest through internships or skilled trade programs, and clears them for classified work as quickly as possible. The critical nature of our nuclear deterrent mission should drive us to hire and retain the best workers our country has to offer.

NUCLEAR WEAPONS SAFETY AND SECURITY

The Nation's nuclear security standard is absolute denial of unauthorized access to nuclear weapons. We work closely with our Navy and Air Force partners to assess nuclear security requirements and adjust our force posture, training, and equipment to address any threat. While we continue to upgrade

and evolve our security capabilities, there are areas where additional investments are necessary to maintain the high standards this mission demands.

The proliferation, ease of use, and sophisticated capabilities of small, unmanned aircraft systems (sUAS) represent a growing threat to our deterrence operations. We rapidly fielded counter sUAS capabilities and are refining tactics, techniques, and procedures to address the developing threat. Focused leadership, vigilance, and dedicated investment are necessary to remain ahead of this threat.

With Congressional support, we recently achieved an important security milestone with the Air Force awarding a contract to replace our aged UH-1N helicopter fleet with the new MH-139. The new helicopter is a critical element in securing our vast ICBM complex and our security forces eagerly await its deployment. The first production unit is already well along the production line in Pennsylvania. With this program moving forward, we can now focus our efforts on replacing security vehicles and deploying advanced communication systems that will provide security personnel uninterrupted situational awareness anywhere they operate.

21st CENTURY DETERRENCE

21st century deterrence not only requires effective NC3, a modernized triad of nuclear ICBMs, SLBMs, and bombers with air delivered weapons, and an ability to design and produce modern and more effective nuclear weapons, it also requires conventional global strike, space control, control of the electromagnetic spectrum, and missile defense. When effectively integrated these capabilities provide the Joint Force the ability to respond to adversary actions in the domain, location and time of our choosing.

CONVENTIONAL GLOBAL STRIKE

Bombers are capable of carrying a variety of conventional and nuclear weapon types with diverse attributes contributing to the flexibility of the deterrent force. Additionally, bombers are integral to our international engagements and partnering through our Bomber Task Force (BTF) missions, and our demonstrated capability to conduct strike missions originating from the continental United States. BTF deployments to the Indo-Pacific and European theaters provide an opportunity to exercise and train with our allies and partners, demonstrate U.S. commitment and resolve, and deter potential adversaries.

The B-1 is the workhorse of the past 17 years of conventional fighting. The B-1 has had many successes in Iraq, Syria, and Afghanistan, while providing USSTRATCOM a credible conventional deterrent against global threats. As the threshold platform for the Long Range Anti-Ship Missile, the B-1 will remain a formidable asset for operations in the Pacific and across the globe. Similar to the B-52, the Air Force remains committed to maintaining the platform to ensure its continued operational effectiveness.

Strategic competitors are investing significant resources to develop offensive and defensive capabilities with the purpose of countering our entire deterrence strategy. To maintain peace, the United States must continue to invest in technological innovation and development of survivable, long-range strike systems able to hold time-sensitive and high-value targets at risk. Today, the only prompt long-range strike capabilities are ballistic missile systems armed with nuclear warheads. We need a conventional prompt global strike capability. This is the USSTRATCOM requirement. Conventional hypersonic strike weapons could meet this requirement and provide responsive, long-range, strike options against distant, defended, and/or time-critical threats when other forces are unavailable, denied access, or not preferred. While conventional hypersonic weapons are not a replacement for nuclear weapons, their unique attributes will increase traditional warfighting advantages and bolster conventional and strategic deterrence.

The DoD identified conventional hypersonic strike as a top research and development priority and is moving forward with a mix of land, sea, and air-launched weapon system options to hold high value, heavily defended and time critical targets at risk. This is a Department-wide, multi-Service, collaborative effort to provide operational capabilities as soon as possible. The Navy's Conventional Prompt Strike (CPS) program spearheads the initiative as the leading technology maturation effort allowing the Navy to field a submarine/ship launched intermediate-range CPS weapon system that can be leveraged into Air Force and Army efforts. The Air Force continues to explore both air-launched hypersonic boost-glide and cruise missile concepts for fielding on a variety of strike and bomber aircraft. The Army plans to incorporate hypersonic strike systems into their traditional long-range precision fires portfolio to expand the reach of surface-to-surface engagements. Each of these capabilities have the potential for early operational fielding within the next few years. This flexible mix of capabilities will provide Combatant Commanders persistent, visible and credible strike options without crossing the nuclear threshold.

SPACE OPERATIONS

For decades, the United States has enjoyed unimpeded freedom of action in space. This allows us to deliver space capabilities that include intelligence collection, missile warning, weather monitoring, satellite communications as well as precise positioning, navigation, and timing essential to joint forces operating globally with unmatched speed, agility and lethality. These same capabilities also contribute to our economy and support our quality of life.

The President has directed a renewed commitment to space. Our commitment extends to the integration of space capabilities across every domain in order to deliver an unmatched global advantage to the Joint Force. What remains unchanged is the fact that our principal competitors regard space as a

warfighting domain. While the United States prefers space to remain free of conflict, we are rapidly moving to meet and overcome challenges impeding our ability to access and freely operate in space. The best way to deter a war that starts in, or extends into space, is to be ready to fight and win.

As part of this effort, the President has given direction for a more cohesive, robust space warfighting organization. In December, upon the recommendation of the Secretary of Defense and the Joint Chiefs, the President directed the establishment of U.S. Space Command (USSPACECOM) as a unified combatant command to improve joint warfighting in the space domain. Moving expeditiously to a unified space command reflects the importance of warfighting in space to the Joint Force, the value of space-focused deterrence elements, and the critical need for space-related response options for the Nation. USSTRATCOM will maintain its focus on this critical mission area until authorities and responsibilities governing space operations fully, and successfully, transition to a new combatant command.

In addition to realizing a dedicated unified space command, we are moving forward on a priority effort executing tasks directed in Space Policy Directive-3. USSTRATCOM is closely partnering with the Department of Commerce (DoC) to transition some non-military aspects of Space Situational Awareness (SSA) data publication and space traffic management-related functions to DoC, while continuing to provide SSA data to support U.S. Government customers and to advance military-to-military relationships that support worldwide combined military operations.

USSTRATCOM's new SSA data sharing initiative, executed through the Joint Force Space Component, releases information about space objects not previously available outside of DoD channels, to enhance SSA data sharing, transparency, and spaceflight safety. This initiative is in line with national policy as part of a larger effort to preserve the safety of, and accessibility to space, so that our Nation, allies, and even the rest of the world, can continue to reap the benefits of space.

Exercises and wargames continue to refine how we coordinate today and how we will work together in the future. This year, Japan participated in the Schriever Wargame for the first time, joining Australia, Canada, France, Germany, New Zealand, and the United Kingdom. We also executed GLOBAL SENTINEL 2018, our fifth annual operational tabletop experiment for SSA, and increased its international participation to include Australia, Canada, the United Kingdom, France, Spain, Germany, Italy, Japan, and the Republic of Korea. Chile and Norway attended as observers.

USSTRATCOM continues to focus on cultivating a robust international engagement environment with several ongoing lines of effort. In doing so, we have generated significant momentum leading to a fully integrated partnership of nations dedicated to defending the peaceful use of space.

Improved partnership with allies is paramount for the safety and security of the space domain. As we continue our Combined Space Operations (CSpO) initiative with Australia, Canada, New Zealand, and the United Kingdom, we recently expanded it with the addition of France and Germany. In July 2018, the

Joint Space Operations Center (JSPOC) transitioned to a Combined Space Operations Center (CSpOC), now the centralized hub for operational space planning and tasking with distributed execution through contributing partners. This effort goes hand in hand with our recent update to Operation OLYMPIC DEFENDER to include international partners and define our operational relationships and associated authorities as we conduct combined operations in the space domain.

The National Space Defense Center (NSDC) continues to mature as our 24/7/365 operational center to protect and defend the space domain. The NSDC remains the focal point for unity of effort across DoD, the Intelligence Community, and the National Reconnaissance Office for information sharing and to rapidly detect, warn, characterize, attribute and defend against threats to our Nation's vital space systems.

Future satellite communications (SATCOM) systems remain key to our continued strategic posture in space. We must design and fund replacement systems and remain on schedule for smooth transition of operations to these new systems. We must expand international SATCOM partnerships, strengthen our industrial base response to acquisition challenges, and integrate commercial opportunities to evolve future satellite payloads towards commercial solutions wherever possible.

The inclusion of our allies is key to building a robust SATCOM network that leverages commercial integration, synchronization and sharing of resources. Multilateral agreements with Canada, Denmark, Luxembourg, Netherlands, and New Zealand provide funding for the operation of Wideband Global SATCOM (WGS). Consequently, the department shares bandwidth proportionally with our partner nations and allocates bandwidth based on the amount of their financial contribution. The growth of the WGS constellation continues as we launch WGS-10 in early 2019, and with newly-infused funding authorized in the FY 2018 NDAA, we plan to procure and launch additional WGS capacity.

Addressing the synchronization gap between terminals, ground infrastructure, and on-orbit satellite capacity remains a significant concern. The narrowband SATCOM legacy constellation is aging, and we must continue to make progress transitioning to the Mobile User Objective System, leveraging commercial capabilities where appropriate. The fielding of new AEHF Extended Data Rate (XDR) capable satellites continued with the launch of AEHF-4 in October 2018. That event, coupled with the anticipated launch of two more AEHF satellites in the next two years, will cover our near term protected communications equities.

USSTRATCOM, in conjunction with the Services, continues to pursue an enterprise approach to fighting SATCOM in a contested domain through the stand-up of the SATCOM Integrated Operations Environment (SIOE). The SIOE is designed to leverage key wideband, narrowband, protected band, and commercial SATCOM enterprise capabilities and expertise to improve our ability to mitigate and fight through SATCOM degraded environment. We will also aggressively pursue the integration of

commercial capabilities that have the ability to provide robust, resilient augmentation of our constellations for a very reasonable cost.

We must improve how we collectively organize, train, and equip ourselves for unfettered access to and freedom to operate in space, providing vital capabilities to joint and coalition forces in peacetime and across the spectrum of conflict. As potential adversaries continue to develop, test, and field more threats to our space systems, USSTRATCOM (and the future USSPACECOM) will benefit from increased focus on these key areas that enable us to deter aggression and protect our interests. We must go faster to stay ahead of potential adversaries, and USSTRATCOM is committed to ensuring sustained space operations with available forces during this transition period until USSPACECOM is ready to assume the lead role.

The President has also focused on the benefits of establishing a sixth branch of the military, the Space Force. The President and Vice President have been personally involved in developing this new Force and Acting Secretary of Defense Shanahan has worked across the Department to define the proposal. The Space Force will be a separate service within the Department of the Air Force. I support the creation of the Space Force within the Department of the Air Force. This will allow proper focus on the warfighting challenges, effective and aligned support to the new USSPACECOM, and given the threats and challenges in the domain, help to build an enduring “space-minded” culture in the department. This effort will not create or require a large, new support bureaucracy. Someday, the Space Force will be its own department, but this is not yet the right time. I thank the President and the Vice President for recognizing that space is a warfighting domain and proposing a fiscally responsible approach for the organizations needed to address these critical challenges. I encourage the Congress to support this proposal.

USSTRATCOM and the future USSPACECOM will directly benefit from the President’s intent to accelerate space acquisition timing. Current 10- to 15-year cycles from requirement to fielded capability are too long. Not only do we miss out on application of new technology and field equipment that is already obsolete on Day 1, but we also need a systemic change to counter potential adversaries with faster acquisition cycles. Commercial innovation has already adapted to exploit faster and faster technology discovery in commercial competition, and we must change to leverage these accelerating opportunities not only to defend our Joint Force in space, but also to protect commercial investments that sustain the global economy. USSTRATCOM (and the future USSPACECOM) look forward to leveraging the benefits of the new Space Force as our organizations focus on two things – defending the space domain and going fast.

JOINT ELECTROMAGNETIC SPECTRUM OPERATIONS (JEMSO)

The Electromagnetic Spectrum (EMS) is the one physical maneuver space shared by all forces in all domains. The EMS is central to the first strategic goal of organizing forces to achieve Joint Force commander objectives. The Joint Force operates in the EMS to achieve superiority at a time and place of our choosing. Our adversaries recognize the need to decisively achieve EMS control and have developed and organized their forces accordingly. In recognition, we must continue to pursue capabilities necessary to maintain EMS superiority. Achieving EMS superiority early in conflict is critical for effective U.S. operations in all domains.

USSTRATCOM, in coordination with DoD CIO/DISA, is actively pursuing development of an Electromagnetic Battle Management (EMBM) system to enable EMS superiority. We are supporting the EMS Operations governance study directed by the Joint Requirements Oversight Council and coordinating with other combatant commands on the development and implementation of JEMSO cells and tactics, techniques, and procedures. Additionally, we continue to engage Australia and North Atlantic Treaty Organization partners to ensure compatible JEMSO doctrine and concepts of operation, and to lay the groundwork for interoperable EMBM systems.

Section 1053 of the FY 2019 NDAA, PL 115-232, provides guidance to the Secretary of Defense on electronic warfare and JEMSO to improve our ability to advocate effectively for requirements. USSTRATCOM is working closely with the Acting Secretary and Services to implement measures of the act, the Electronic Warfare Executive Committee and the previously mandated cross-functional team to identify requirements and specific plans for addressing personnel, capability and capacity limitations in order to ensure effective implementation of DoD's Electronic Warfare Strategy.

THE MISSILE DEFENSE REVIEW

Conducted at the direction of the President, the 2019 Missile Defense Review (MDR) presents the Administration's missile defense policy and strategy. The MDR aligns with the National Security Strategy, the National Defense Strategy, and the 2018 NPR. The MDR reinforces the Administration's commitment to defending the United States and our deployed forces and allies from adversary missile attacks.

The United States and our allies and partners face potential adversaries who are increasing existing missile system capability and capacity; adding new and unprecedented types of armaments to their arsenals; and integrating offensive capability more thoroughly in their coercive threats, military strategy, and war planning. Left unaddressed, this expanding missile threat could embolden our adversaries into mistakenly believing they can coerce us, inhibit our freedom of action, or undermine our

security alliances. A concerted U.S. effort is required to expand and improve existing capabilities for both homeland and regional missile defense.

As stated in the National Security Strategy, the United States has a robust and credible layered missile defense system. When paired with offensive capabilities this combination sends a strong message allowing the United States to deny benefits and impose costs against any potential adversary. Although the United States relies on nuclear capability to dissuade near-peer strategic threats, missile defense endures as a critical component of comprehensive U.S. strategic and tailored regional deterrence strategies. Our regional missile defenses protect against missile attacks on deployed U.S. forces, allies, and partners; assists allies and partners in better defending themselves; preserves freedom of action; and counters adversary anti-access/area denial tactics. The United States is pursuing new concepts and technologies to ensure continuing effectiveness against advanced future threats, including space-based sensors and boost phase intercept. As we address future threats, we must account for the air and missile defense assets required to defend the homeland, while simultaneously improving our regional security architectures. In this effort, there is no one silver bullet, but several layered capabilities are in development.

MISSILE DEFENSE

The 2019 MDR sets the foundation for the next generation of missile defense efforts. Of importance to USSTRATCOM, it provides an opportunity to conduct focused reviews clarifying and optimizing missile defense roles and responsibilities across the Department. This includes opportunity to assign responsibility for integrating pre-launch attack operations with defenses to mitigate missile threats, ensuring warfighter involvement in our Departmental requirements and fielding processes, and assessing how to better use missile warning assets against emerging threats. All of these efforts focus on reviewing current systems and addressing advanced adversary capabilities such as hypersonic threats.

U.S. missile defense capabilities will be sized to provide continuing effective protection of the U.S. homeland against rogue states' offensive missile threats. The United States relies on nuclear deterrence to address the large and more sophisticated Russian and Chinese intercontinental ballistic missile capabilities, as well as to deter attacks from any source consistent with long-standing U.S. declaratory policy as re-affirmed in the 2018 NPR.

As the warfighter advocate for Missile Defense, it is imperative that we focus materiel developers on research, development, testing, and engineering against advanced threats. Rapidly transitioning ready systems with identified funding streams to the Services will free up needed resources for critical research and development efforts such as continued funding of next generation

space systems. Research and development is key to ensuring we keep pace with evolving adversary threats across all domains. Space systems provide valuable solutions to layered tracking and discrimination capability. A space tracking and discrimination constellation combined with next generation Overhead Persistent Infrared systems would provide significant improvements necessary to detect advanced threats. Future space-based sensors may be able to detect, track, and discriminate hypersonic glide vehicle and ballistic missile threats globally. These abilities cannot be fully achieved with the current or any future terrestrial-based radar architecture due to the constraints of geography and characteristics of future missile threats.

Boost phase intercept is also showing promise. Increasing the power and lethality of laser, neutral particle beam, and high power radio frequency systems for multi-mission applications, along with new fighter-delivered interceptors, can exponentially enhance our missile defenses.

ASSURING ALLIES AND PARTNERS

USSTRATCOM cannot accomplish its mission without integrating allies and partners. Allies are critical to responding to mutual threats, preserving our shared interests, and are the greatest asymmetric advantage the United States has over potential adversaries. The Command continues to expand and enhance the viability of our Nation's alliances and partnerships, setting conditions across the globe to deter our adversaries.

USSTRATCOM's engagements with allies and partners are critical in shaping the strategic environment, strengthening relationships, and building trust. In doing so, we are prepared to act in a combined manner to deliver a decisive response in crisis or during contingency operations.

During 2018, our Command conducted over 50 bilateral engagements with senior leaders from Australia, Brazil, Canada, Denmark, France, Germany, Great Britain, Iceland, Japan, Netherlands, Pakistan, the Republic of Korea, Taiwan, and Thailand.

Our 25-nation, multinational missile defense policy campaign of experimentation, NIMBLE TITAN (NT) 2018, concluded with a senior leader seminar held at the new NATO headquarters in Brussels, to include representatives from Europe, the Gulf States, the Indo-Pacific, and North America. The NT 2020 campaign is just beginning, and continues to show increased interest by partners and allies.

USSTRATCOM works closely with our allies and partners to enhance awareness within the space domain, increase the safety of spaceflight operations, and promote the responsible, peaceful, and safe use of space. During 2018, USSTRATCOM signed new national agreements with Brazil, Denmark, the Netherlands, New Zealand, and Thailand for sharing SSA services and data. Currently, USSTRATCOM has agreements with 18 nations, two intergovernmental organizations, and over 70 commercial satellite launchers, owners, and operators.

Our efforts in this area increase military interoperability, improve alliance capability and capacity, and integrate our critical defense missions. The Command's engagements assure allies and partners of the United States' extended deterrence commitments and reinforce non-proliferation goals and objectives.

CONCLUSION

USSTRATCOM is a global warfighting command. Success in all of our missions depend on the Command's greatest strength – our people. The 162,000 men and women stationed around the globe, operating in all domains, undertake the active defense of our Nation every day. These Soldiers, Sailors, Airmen, Marines, and civilians are warfighters, dedicated to preserving the peace and when called upon, ready to dominate and win in conflict. Successful mission execution has the appearance of “business as usual” which belies the effort and impact of executing at the highest standard every day.

Today, our capabilities are safe, secure, and effective and our forces are combat-ready. With continued support of the programmed major investments, our forces will prevent nuclear war and ensure that regardless of how would-be adversaries might choose to attack the United States, we will always retain decisive response options, across the spectrum of conflict, for the President.

We are dominant today. However, advantages we have long-held are eroding, challenging the Command's ability to deter strategic attack, engage in active defense, assure our allies and partners, and fight and win in and across all domains if necessary. We cannot let this erosion continue. We must maintain our strategic advantage. We must take calculated, smart risks and move fast once again. With sustained Congressional support, USSTRATCOM will continue to effectively defend the nation.

Nuclear war cannot be won and must never be fought. Therefore, to prevent war we must be ready for war. We must maintain today's triad of nuclear forces, while simultaneously building the triad of tomorrow. We must integrate all domains and capabilities together to effectively deter in the 21st century. If we are successful, we will continue to live up to our motto, coined over 60 years ago. Peace is our Profession...

General John E. Hyten

Gen. John E. Hyten is Commander of U.S. Strategic Command, one of ten Unified Commands under the Department of Defense. USSTRATCOM is responsible for the global command and control of U.S. strategic forces to meet decisive national security objectives, providing a broad range of strategic capabilities and options for the President and Secretary of Defense.

General Hyten attended Harvard University on an Air Force Reserve Officer's Training Corps scholarship, graduated in 1981 with a bachelor's degree in engineering and applied sciences and was commissioned a second lieutenant. General Hyten's career includes assignments in a variety of space acquisition and operations positions. He served in senior engineering positions on both Air Force and Army anti-satellite weapon system programs.

The general's staff assignments include tours with the Air Force Secretariat, the Air Staff, the Joint Staff and the Commander's Action Group at Headquarters Air Force Space Command as Director. He served as mission director in Cheyenne Mountain and was the last active-duty commander of the 6th Space Operations Squadron at Offutt Air Force Base, Nebraska. In 2006, he deployed to Southwest Asia as Director of Space Forces for operations Enduring Freedom and Iraqi Freedom. General Hyten commanded the 595th Space Group and the 50th Space Wing at Schriever AFB, Colorado. Prior to assuming command of Air Force Space Command, he served as the Vice Commander, Air Force Space Command.

EDUCATION

1981 Bachelor's degree in engineering and applied sciences, Harvard University, Cambridge, Mass.
 1985 Master of Business Administration degree, Auburn University, Montgomery, Ala.
 1985 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
 1994 Distinguished graduate, Air Command and Staff College, Maxwell AFB, Ala.
 1999 National Defense Fellow, University of Illinois, Champaign, Ill.
 2011 Senior Managers in Government Course, Harvard University, Cambridge, Mass.

ASSIGNMENTS

November 1981 - December 1985, Configuration Management Officer and Chief, Configuration Management Division, Automated Systems Program Office, Gunter AFB, Ala.
 December 1985 - July 1989, Chief, Software Development Branch; and Chief, Engineering and Acquisition Division, Space Defense Programs Office, Los Angeles AFB, Calif.
 August 1989 - July 1990, Special Adviser to the U.S. Army, Kinetic Energy Anti-Satellite Program Office, U.S. Army Strategic Defense Command, Huntsville, Ala.
 July 1990 - August 1991, Deputy for Engineering, Strategic Defense Initiatives Program Office, Los Angeles AFB, Calif.
 August 1991 - May 1992, Executive Speechwriter and Systems Analyst, Assistant Secretary of the Air Force (Acquisition), the Pentagon, Arlington, Va.
 May 1992 - July 1993, Program Element Monitor, Advanced Technology Programs, Assistant Secretary of the Air Force (Acquisition), the Pentagon, Arlington, Va.
 July 1993 - June 1994, Student, Air Command and Staff College, Maxwell AFB, Ala.
 July 1994 - June 1996, Mission Director, Space Operations Officer, and Chief, Command Center Training, U.S. Space Command, Cheyenne Mountain Air Force Station, Colo.
 August 1996 - August 1998, Commander, 6th Space Operations Squadron, Offutt AFB, Neb.
 August 1998 - June 1999, National Defense Fellow, University of Illinois, Champaign, Ill.
 June 1999 - June 2001, Operations Officer, and Chief, Space Branch, Defense and Space Operations Division, Deputy Director for Operations (Current Readiness and Capabilities), J3, Joint Staff, the Pentagon, Arlington, Va.
 June 2001 - June 2003, Chief, Space Control Division, Directorate for Space Operations and Integration, Deputy Chief of Staff for Air and Space Operations, Headquarters U.S. Air Force, Arlington, Va.
 June 2003 - July 2004, Director, Commander's Action Group, Headquarters Air Force Space Command,

Peterson AFB, Colo.

July 2004 - April 2005, Commander, 595th Space Group, Schriever AFB, Colo.

April 2005 - May 2007, Commander, 50th Space Wing, Schriever AFB, Colo. (May 2006 - October 2006, Director of Space Forces, U.S. Central Command Air Forces, Southwest Asia)

May 2007- September 2009, Director of Requirements, Headquarters Air Force Space Command, Peterson AFB, Colo.

September 2009 - February 2010, Director, Cyber and Space Operations, Directorate of Operations. Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force, Arlington, Va.

February 2010 - August 2010, Director, Space Acquisition, Office of the Under Secretary of the Air Force, the Pentagon, Arlington, Va.

September 2010 - May 2012, Director, Space Programs, Office of the Assistant Secretary of the Air Force for Acquisition, Arlington, Va.

May 2012 - Aug 2014, Vice Commander, Air Force Space Command, Peterson AFB, Colo.

Aug 2014 - Oct 2016, Commander, Air Force Space Command, Peterson AFB, Colo.

Nov 2016 - present, Commander, U.S. Strategic Command, Offutt AFB, Neb.

SUMMARY OF JOINT ASSIGNMENTS

1. July 1994 - June 1996, Mission Director, Space Operations Officer, and Chief, Command Center Training, U.S. Space Command, Cheyenne Mountain Air Force Station, Colo., as a major
2. June 1999 - June 2001, Operations Officer, and Chief, Space Branch, Defense and Space Operations Division, Deputy Director for Operations (Current Readiness and Capabilities), J3, Joint Staff, the Pentagon, Arlington, Va., as a lieutenant colonel

BADGES

Master Space Operations Badge

Master Cyberspace Operator Badge

MAJOR AWARDS AND DECORATIONS

Distinguished Service Medal with oak leaf cluster

Legion of Merit with oak leaf cluster

Defense Meritorious Service Medal with two oak leaf clusters

Meritorious Service Medal with four oak leaf clusters

Air Force Commendation Medal

Army Commendation Medal

Joint Staff Achievement Medal

Air Force Achievement Medal

OTHER ACHIEVEMENTS

1991 Recipient of the William Jump Award for Excellence within the Federal Government

1998 Recipient of a Laurels Award, Aviation Week and Space Technology Magazine

2009 Gen. Jerome F. O'Malley Distinguished Space Leadership Award

PUBLICATIONS

"A Sea of Peace or a Theater of War: Dealing with the Inevitable Conflict in Space," The Program in Arms Control, Disarmament, and International Security Occasional Paper, University of Illinois, 2000

"A Sea of Peace or a Theater of War," Air and Space Power Journal, Air University Press, 2002

"Moral and Ethical Decisions Regarding Space Warfare," with Dr. Robert Uy, Air and Space Power Journal, Air University Press, 2004

EFFECTIVE DATES OF PROMOTION

Second Lieutenant Aug. 23, 1981

First Lieutenant Aug. 23, 1983

Captain Aug. 23, 1985

Major May 1, 1993

Lieutenant Colonel Jan. 1, 1997

Colonel June 1, 2002
Brigadier General Oct. 1, 2007
Major General Nov. 10, 2010
Lieutenant General May 18, 2012
General Aug. 15, 2014

(Current as of July 2018)

NOT FOR PUBLICATION UNTIL RELEASED BY
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
PRIORITIES FOR
DEPARTMENT OF DEFENSE NUCLEAR FORCES
28 MARCH 2019

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THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

Introduction

Chairman Cooper, Ranking Member Turner, and distinguished Members of the subcommittee, thank you for this opportunity to discuss the sea-based leg of the triad. It is an honor to testify before you this morning representing the Navy's Strategic Systems Programs (SSP).

The Nation's nuclear triad of intercontinental ballistic missiles, strategic bombers, and ballistic missile submarines (SSBNs) equipped with submarine-launched ballistic missiles (SLBM) is essential to our ability to deter major warfare with adversaries and assure our allies. Each leg provides unique attributes and, together, provides critical diversity and flexibility. The 2018 Nuclear Posture Review (NPR) reaffirmed that foreign nuclear threats are growing and Great Power competition has returned and, thus, reinforced the need to recapitalize each component of the triad. The nuclear triad is the bedrock of our ability to deter aggression, assure our allies and partners, achieve U.S. objectives should deterrence fail, and hedge against an uncertain future; it is the Department of Defense's number one priority mission.

The Navy provides the most survivable leg of the triad with our OHIO-Class SSBNs and the Trident II (D5) strategic weapon system (SWS) they carry. SSBNs are responsible for a significant majority of the Nation's operationally deployed nuclear warheads. The Chief of Naval Operations has made clear the priority the Navy places on the sustainment and modernization of the undersea leg of the triad, directing the Navy to "be ready to deploy USS COLUMBIA (SSBN 826) as quickly as possible—beating the current schedule—in order to preserve our ability to defeat the threat." Delay is not an option.

SSP's fundamental mission is to design, develop, produce, sustain, and ensure the safety and security of the Trident II (D5) SWS, comprising the SLBM, reentry systems, and shipboard systems. We strive to maintain a culture of excellence, underpinned by self-assessment, to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission. We focus unrelentingly on our

tremendous responsibility for the custody and accountability of our Nation's nuclear assets. The men and women of SSP and our industry partners remain dedicated to supporting the mission of our Sailors on strategic deterrent patrol and our Marines, Sailors, and Coast Guardsmen who stand watch, safeguarding the weapons with which we are entrusted by this Nation.

Our Fiscal Year (FY) 2020 budget request provides the required funding to support the program of record for the Trident II (D5) SWS. To sustain this capability and usher in a new era of development efforts, I am focusing on my top priorities: nuclear weapons safety and security; the Trident II (D5) Life Extension Program; NPR-directed activities; the COLUMBIA-Class Program; the Industrial Base, infrastructure, and capabilities; support to the United Kingdom's continuous at-sea deterrent; and the workforce that enables this mission every day.

The men and women of SSP and their predecessors have provided unwavering and single mission-focused support to develop, sustain, and secure the sea-based leg of the triad for over six decades. SSP now faces a bow wave of critical modernization activities, and our workforce is evolving from years of sustainment efforts to large-scale development, as most recently evidenced by the 2018 NPR implementation and our expanding mission into conventional hypersonic capabilities. The organization must be prepared not only to sustain today's deterrent, but to modernize it so that it remains a credible, effective SWS that can support our ballistic missile submarines and our strategic deterrent mission through the life of the COLUMBIA-Class SSBN.

As the fourteenth Director, it is my highest honor to serve as the program manager, technical authority, safety and security lead, regulatory lead, and Polaris Sales Agreement Project Officer for the Navy's nuclear weapons program. Most importantly, I am honored to represent the men and women of SSP, comprising approximately 1,700 Sailors, 1,000 Marines, 300 Coast Guardsmen, 1,200 civilians, and over 2,000 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.

Safety and Security

The first priority, and the most important, is the safety and security of the Navy's nuclear weapons. Accordingly, Navy leadership delegated and defined SSP's role as the program manager and technical authority for the Navy's nuclear weapons. At its most basic level, this priority is the physical security of one of our nation's most valuable assets. Our Marines and Navy Masters at Arms provide an effective and integrated elite security force at our two Strategic Weapons Facilities and Waterfront Restricted Areas in Kings Bay, Georgia, and Bangor, Washington. U.S. Coast Guard Maritime Force Protection Units have been commissioned at both facilities to protect our submarines. Together, the Navy, Marine Corps, and Coast Guard team form the foundation of our security program, while headquarters staff ensures that nuclear weapons-capable activities comply with safety and security standards.

The Navy maintains a culture of self-assessment in order to ensure safety and security. This is accomplished through biennial assessments, periodic technical evaluations, formal inspections, and continuous on-site monitoring and reporting at the Strategic Weapons Facilities. We strive to maintain a culture of excellence to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission and continue to focus on the custody and accountability of the assets entrusted to the Navy. SSP's number one priority is to maintain a safe and secure strategic deterrent for the Navy.

D5 Life Extension Program

The Trident II (D5) SWS has been deployed on the OHIO-Class ballistic missile submarines for nearly three decades and is planned to be deployed more than 50 years. This is well beyond its original design life of 25 years and more than double the historical service life of any previous sea-based strategic deterrent system. As a result, SSP is extending the life of the Trident II (D5) SWS to match the OHIO-Class submarine service life and to serve as the initial SWS for the COLUMBIA-Class SSBN. Our life extension efforts will ensure an effective and credible SWS on both the OHIO-Class and

COLUMBIA-Class SSBNs until the 2040s. This is being accomplished through an update to all the Trident II (D5) SWS subsystems: launcher, navigation, fire control, guidance, missile, and reentry. Our initial life extension of missile and guidance flight hardware components is designed to meet the same form, fit, and function of the original system, maintain the deployed system as one homogeneous population, control costs, and sustain the demonstrated performance of the system.

The Navy's D5 life extension program is executing on schedule to continue to meet deterrence requirements. In FY 2018, the Navy deployed 24 life-extended D5 missiles (D5LE) to the fleet and remains on track to complete deployment by FY 2024. In June 2018, we successfully conducted the first D5LE flight test of four missiles to support the Commander Evaluation Test (CET) program. The CET program obtains and monitors reliability, accuracy, and performance data of the D5LE missile population in an operational environment, and is one method used to monitor the long-term effectiveness of this nuclear deterrent weapon system.

Another major initiative to ensure the continued sustainment of our SWS is the SSP Shipboard Systems Integration (SSI) Program, which manages obsolescence and modernizes SWS shipboard systems through the use of open architecture design and commercial off-the-shelf hardware and software. The SSI Program refreshes shipboard electronics hardware and upgrades software, which will extend service life, enable more efficient and affordable future maintenance of the SWS, and ensure we continue to provide the highest level of nuclear weapons safety and security for our deployed SSBNs while meeting U.S. Strategic Command (USSTRATCOM) requirements. Our organization performed over 90 fleet and shore-based incremental installations over the last three years. Sixteen installations were completed in 2018, and two began this year with an additional five planned for completion. Three shipboard modernization increments are currently in development for future installation.

The Navy also works in partnership with the Department of Energy's National Nuclear Security Administration (NNSA) to refurbish our reentry systems. The Trident II (D5) is capable of carrying two types of warheads, the W76 and the W88, which are

both undergoing refurbishment. Deliveries of life-extended W76 warheads, known as the W76-1, to the Navy are nearly 100 percent complete and are on track to finish by the end of FY 2019. The W76-1 program has been a tremendous effort that informs much of our understanding of refurbishment programs, and I laud our NNSA partners for their support of the Navy's deterrent. The W88 major alteration program also remains on track to support a first production unit in calendar year 2019 with production scheduled to be completed in FY 2024. These combined efforts to refurbish the Navy's reentry systems ensure that the Navy can meet USSTRATCOM requirements for decades to come.

Nuclear Posture Review Activities

The Navy is also beginning an approach to maintain a credible and effective SWS beyond 2040. For example, we are leveraging the work being done today to extend the life of the Trident II (D5) SWS as well as investigating opportunities to innovate, such as through the application of model-based engineering. As directed in the Nuclear Posture Review, the Navy will begin "studies in 2020 to define a cost-effective, credible, and effective SLBM that we can deploy throughout the service life of the COLUMBIA SSBN." These threat-informed studies will underpin decisions made to sustain the Trident II (D5) SLBM and to maintain an adaptable and flexible sea-based deterrent for the Nation. SSP has a history of more than 60 years of developing, producing, and supporting SWSs to support the undersea leg of the triad. We are optimizing our SWS by applying lessons learned from six generations of missiles and will continue to do so until the 2080s.

As we face increasingly agile, advanced, and persistent cyber threats to our nuclear enterprise, SSP must be constantly vigilant of our adversaries' means and methods of obtaining critical technology and information about the Navy's SWS. In order to protect our technical advantage from significant harm today and into the future, we are laying the groundwork with our industry partners to revolutionize our business practices. Securing program information within the industrial base and adjusting procurement approaches will ensure long-term stability of our design, development, and sustainment efforts. The ability to drive concerted progress within the nuclear enterprise is critical to the security

and survivability of our current and future SWS and the platform on which it is deployed to defend the Nation.

In accordance with the 2018 Nuclear Posture Review's recommendation to pursue supplemental capabilities, SSP is fielding of a small number of low-yield SLBMs and is participating in a nuclear-armed sea-launched cruise missile (SLCM) study. The near-term low-yield SLBM and long-term SLCM efforts are intended to address deterrence gaps and assure allies. Our budget request supports executing a low-yield SLBM option, configured to leverage the W76-1 life-extension efforts. The low-yield program, known as the W76-2, is on track to meet warfighter requirements. The W76-2 modification will not increase the number of deployed ballistic missile warheads and leverages the people, processes, and schedule from the W76-1 program to ensure a cost-effective and executable approach. The W76-2 weapon system will enhance deterrence by denying potential adversaries any mistaken confidence that limited nuclear employment can provide a useful advantage over the United States and its allies.

In the mid-term, the 2018 Nuclear Posture Review directed the Navy to investigate the feasibility of fielding the nuclear explosive package from the Air Force's W78 warhead replacement into a Navy reentry body. This ongoing effort will inform Nuclear Weapons Council decisions regarding SLBM warhead modernization needs.

SWS and the COLUMBIA-Class Program

The Navy's highest priority acquisition program is the COLUMBIA Class Program, which replaces the existing OHIO Class submarines. The continued assurance of our sea-based strategic deterrent requires a credible SWS, as well as the development of the next class of ballistic missile submarines. Accordingly, the Navy is taking the necessary steps to ensure the COLUMBIA SSBN is designed, built, delivered, and tested on time with the right capabilities at an affordable cost.

To lower development costs and leverage the proven reliability of the Trident II (D5) SWS, the COLUMBIA SSBN will enter service with the life-extended Trident II (D5) SLBM, which is resident today on 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 into the 2040s.

A critical component of the COLUMBIA Class Program is the development of a Common Missile Compartment (CMC) with the United Kingdom. Today, the U.S. Navy shares the Trident II (D5) SWS with the UK aboard its Vanguard class of ballistic missile submarines. Similar to the U.S. Navy, the UK is recapitalizing its four aging Vanguard Class SSBN submarines with the Dreadnought-Class SSBN. The CMC will support the life-extended Trident II (D5) SWS to be deployed on the COLUMBIA and the UK Dreadnought-Class SSBNs. Our partnership also supports production of these two new classes of SSBNs in both U.S. and UK build yards. Collaborative efforts also include construction of missile tubes to support building the U.S. prototype Quad-pack module and the SWS Ashore integration test site at Cape Canaveral, Florida.

To manage and mitigate technical risk associated with the delivery of the first submarines to both the U.S. and UK programs, SSP is leading the development of the SWS Ashore integration test site. This is a joint effort between the Navy and the state of Florida, investing in the redevelopment of a 1950s Polaris Missile site to conduct integration testing and verification for COLUMBIA and UK Dreadnought programs. We reached a programmatic milestone in 2017 when Test Bay One, which will be used to test the Missile Service Unit first article, achieved Initial Operational Capability. Last year, we successfully installed the first COLUMBIA missile tube into Test Bay Two and, in the beginning of 2020, we are scheduled to achieve the Initial Operational Capability for verifying and validating the SWS support systems for the COLUMBIA and UK Dreadnought programs.

To mitigate the risk in the restart of launcher system production, SSP developed a surface launch test facility at the Naval Air Warfare Center Weapons Division, China Lake, California. This facility will prove that the launcher industrial base can replicate the performance of the OHIO Class Trident II (D5) launcher system. Thirteen evaluation

and four qualification tests were conducted in 2018, and one qualification test was conducted in January 2019. Eleven remaining tests are planned for 2019. To date, OHIO-Class Trident II (D5) launch performance has been demonstrated.

The OHIO-Class SSBNs begin decommissioning in the late 2020s and the COLUMBIA Class must be ready to start patrols in FY 2031 to maintain a minimum operational force of 10 SSBNs. The Navy has already extended the OHIO Class service life from 30 years to 42 years, and there is no engineering margin left for further life extension. Recapitalizing our SSBNs is a significant investment that only happens every other generation, making it critically important that we do it right. Any delay has the potential to impact not only our ability to meet operational requirements, but also the United Kingdom's strategic deterrent requirements.

Industrial Base, Infrastructure, and Capabilities

Ensuring robust defense and aerospace industrial base capabilities—such as shipyard support, radiation-hardened electronics, and solid rocket motors—remains an important priority. SSP places particular emphasis on the solid rocket motor industry and its sub-tier suppliers. Although the Navy maintains a continuous production capability of solid rocket motors, the demand from both National Aeronautics and Space Administration (NASA) and the Air Force has precipitously declined. This decline results in higher costs for the Navy and puts an entire specialized industry at risk. Future Air Force modernization will provide some much needed relief beginning in the mid-2020s; however, our Nation cannot afford to lose this capability. While the efforts of our industry partners and others create short-term cost relief, the long-term support of the solid rocket motor industry, including its sub-tier supplier base, and maintenance of critical skills remains an issue that must be addressed. For example, we are concerned with ensured access to and affordability of certain critical solid rocket motor constituents, such as ammonium perchlorate. We will continue to work with our industry partners, the Department of Defense, senior NASA leadership, Air Force, and Congress to do everything we can to ensure this vital national security industry asset is preserved.

As the Navy executes the total overhaul and replacement of the SSBN and SLBM leg of the nuclear triad, which will be in service until 2084, NNSA's infrastructure must be prepared to respond in tandem to the evolving needs of the Nation. Of most importance, an effective, resilient, and responsive plutonium pit production capability and capacity can address age-related risks, support planned refurbishments, as well as prepare for future uncertainty. Additionally, tritium, lithium, and uranium, among other strategic materials, are vital to ensuring the Navy can continue to meet its strategic deterrent requirements.

Support to the United Kingdom

The U.S. and UK have maintained a longstanding shared commitment to nuclear deterrence, one that dates to the signing of the Mutual Defense Agreement in 1958 and with the Polaris Sales Agreement (PSA) in 1963. This year, the UK celebrates 50 years of its continuous-at-sea-deterrent—a momentous achievement that the U.S. has proudly supported. Today, the Navy's support encompasses not only the CMC and SSBN programs but also 100 percent of the shipboard systems, missile, and reentry portions—the Strategic Weapon System—of the UK's nuclear deterrent. As the Director of SSP, I serve as the delegated U.S. Project Officer of the PSA and am solely responsible for fulfilling lifecycle support to the UK's program. As SSP shapes the future SWS, we must continue to consider the UK's connection to our decisions and our responsibility to our most important ally. SSP remains steadfastly committed to the UK's continuous-at-sea deterrent and to the mutually beneficial relationship we have both maintained and celebrated for 60 years.

Conclusion

History reminds us that the swift, successful creation and execution of the Fleet Ballistic Missile program in the 1950s was truly a result of 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 gusto and drove this program with a vision. Today's SSP and its industry partners will continue this vision by attracting, nurturing, and

retaining the next generation workforce that will enable a capable, credible strategic deterrent for our Nation for the next 60 years.

SSP ensures a safe, secure, and effective strategic deterrent and focuses on the 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. Our Nation's sea-based deterrent has been a critical component of our national security since the 1950s and must continue to assure our allies and partners and deter potential adversaries well into the future. 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 triad and the vital role it plays in our national 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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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES
U.S. HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES

SUBJECT: FY2020 Priorities for Department of Defense Nuclear Activities

STATEMENT OF: Lieutenant General Richard Clark
Deputy Chief of Staff
Strategic Deterrence & Nuclear Integration
Headquarters, United States Air Force

March 28, 2019

Introduction

Chairman Cooper, Ranking Member Turner, distinguished members of the Subcommittee, thank you for the opportunity to discuss Air Force nuclear programs and policies.

As the 2018 National Defense Strategy notes, “Inter-state strategic competition, not terrorism, is now the primary concern in U.S. national security.” The return of Great Power competition is increasing the significance of nuclear weapons in the strategic environment. As a department, we recognize the impact of Great Power competition on the nuclear deterrence mission and further understand that a large-scale nuclear attack poses the only existential military threat to the United States. This strategic competition, coupled with disruptive technologies (e.g., hypersonics, artificial intelligence) and uncertainty of future arms control regimes, present significant challenges for the United States nuclear deterrent.

Threat (Strategic Environment)

The activities of our two primary strategic competitors, Russia and China, highlight the impacts of Great Power competition on our nuclear deterrence mission. While the U.S. has continued to reduce the number of nuclear weapons, others, including Russia and China, have moved in the opposite direction. In fact, over the last two decades, Russia and China have increased the prominence of nuclear capabilities in their doctrine, modernized their conventional, space, cyber, and nuclear arsenals, and engaged in anti-area/access denial (A2AD) strategies.

The 2018 Nuclear Posture Review (NPR) highlighted that Russia has adopted military strategies and capabilities that rely on nuclear escalation for their success, a troubling doctrinal trend. They continue to modernize their full range of nuclear systems to include road-mobile, silo-based Intercontinental Ballistic Missiles, ballistic missile submarines, bomber aircraft, and cruise missiles.

Equally concerning, however, is China’s pursuit of entirely new nuclear capabilities tailored

to achieve particular national security objectives while also modernizing its conventional military, challenging traditional U.S. military superiority in the Western Pacific. They are developing, testing and fielding new generations of land-based ballistic missiles, increasing the range of their submarine-launched ballistic missiles, and pursuing a new bomber aircraft.

Despite efforts of multiple administrations to negotiate nuclear stockpile reductions and the role of nuclear weapons, neither of our competitors have followed our lead. Rather, they have moved decidedly in the opposite direction. Our adversaries are increasing the capabilities of their existing systems and adding unprecedented disruptive technologies such as hypersonics, artificial intelligence, and cyber capabilities. In light of this, the U.S. must maintain a credible nuclear deterrent to promote strategic stability, protect the Nation, our allies, and our partners.

Arms Control

Complicating this threat environment is the uncertainty of the future arms control framework. The United States utilizes a whole-of-government approach to shape the arms control environment in support of its national security interests, and continually reevaluates arms control writ large to balance proliferation and arms race concerns against current force structure, extended deterrence, and modernization efforts. The transparency and predictability provided by the New START Treaty underwrites an effective deterrence policy and provides the U.S. the flexibility to modernize our nuclear deterrent without fear of starting an arms race. However, as we approach the expiration of the New START Treaty in 2021 and in light of Russia's violation of the Intermediate-Range Nuclear Forces Treaty, the future of nuclear arms control offers both opportunities and challenges. In light of this complex and uncertain threat environment, the U.S. must maintain a credible nuclear deterrent and promote strategic stability to protect the Nation, our allies, and our partners.

Strategy

Nuclear Deterrence is accomplished with a diverse, flexible, capable and credible nuclear force. The 2018 NPR reaffirmed the four roles of U.S. nuclear weapons:

- Deter nuclear and non-nuclear attack
- Assure allies and partners
- Achieve U.S. objectives
- Hedge against an uncertain future

For decades, Republican and Democratic administrations alike have recognized the critical importance of the nuclear triad for keeping the peace by deterring nuclear attack and large-scale war among the Great Powers. The legs of the triad have unique, complementary capabilities (e.g., responsiveness, flexibility, survivability) to deter adversary nuclear attacks, hold global targets at risk, and provide strategic stability through visibility, responsiveness, and survivability. The triad's diversity complicates the adversaries' strategy.

Regarding assurance, the U.S. has formal extended deterrence commitments that assure European, Asian, and Pacific allies through treaties, presence, and force presentation. Our allies' confidence in the U.S. nuclear deterrent is critical to achieving U.S. non-proliferation goals through burden-sharing (NATO commitments), posturing of nuclear forces (bomber assurance and deterrence missions), and common operating systems (e.g., F-35).

Finally, the U.S. must ensure that we have a set of capabilities that are flexible enough to respond to challenges associated with an unpredictable future. By having an adaptable, flexible, and resilient nuclear triad, the United States can protect against these uncertainties in the strategic environment.

The Nuclear Triad

The nuclear triad provides the right set of capabilities to achieve U.S. objectives for

deterrence, assurance, and ensures the ability to achieve objectives if deterrence fails. The triad, consisting of intercontinental ballistic missiles, strategic bombers, and ballistic missile submarines, possess unique attributes, which produce a mutually-supportive and flexible strategic deterrent for the Nation. These unique and overlapping capabilities allow the triad to become more than just the sum of its parts. The triad's synergistic and overlapping attributes help ensure the enduring survivability of our deterrence capabilities against attack and maintains our capacity to hold a range of adversary targets at risk throughout a crisis or conflict, complicating the adversaries strategy. These targets include: static, hardened, relocatable, hard and deeply buried targets, time sensitive targets, geographically complex, and area targets.

Strategic Ground Leg

ICBMs have been the backbone of American Nuclear Deterrence since their inception and will continue to underwrite U.S. Nuclear Deterrence well into the foreseeable future. Always on alert, the ICBM force holds intercontinental, high priority target sets at risk through accurate, high yield weapons. Their utility lies in daily readiness and responsiveness for the President. Variable strike options provide the flexibility to rapidly cover emerging targets, penetrate defenses, and assure mission requirements. The quantity and dispersed nature of ICBMs complicate the adversary's offensive strategy. ICBMs deny the adversary the ability to preemptively destroy the U.S. arsenal with a small-scale strike. As a result, nuclear opponents must consider employing a large number of their weapons against counter-force (ICBM) targets instead of counter-value targets such as cities and other large population centers.

Ground Based Strategic Deterrent (GBSD) is a critical replacement of the Minuteman III Intercontinental Ballistic Missile weapon system. First deployed in the 1970s, the Minuteman III can no longer be cost effectively life-extended. GBSD is a responsive, safe, secure, and accurate weapon system capable of holding adversary targets at risk.

Strategic Air Leg

Nuclear capable bombers are the most flexible and visible leg of the triad. They provide a deterrence-mechanism for escalation control and signaling. Penetrating bombers hold hardened and deeply-buried targets at risk using a diverse set of weapons with pinpoint accuracy and variable yield. Cruise missiles extend the bomber's effective range, complicate enemy defense requirements, and reduce risk to aircrew.

The B-52 remains vital to the bomber fleet and will continue to provide stand off capability. Its current modernization efforts include increased weapons capacity, communication and radar upgrades and engine replacement. The B-2 is the Air Force's penetrating long-range strike aircraft able to reach highly defended targets anywhere on the globe. The B-21 will meet the 2018 National Defense Strategy direction to develop a new stealth bomber. It will provide critical flexibility across a wide range of joint military operations with long-range, large mixed payloads, and survivability.

The Air Launch Cruise Missile (ALCM) is more than 25 years beyond its intended design life and faces evolving threats and availability challenges. The replacement to ALCM is the Long Range Stand Off (LRSO) weapon, which enables the air leg by ensuring the U.S. retains the capability to penetrate A2AD airspace and survive against advanced integrated air defense systems.

Nuclear Command, Control and Communications (NC3)

Nuclear weapons systems and associated NC3 architecture are decades past their service design life and face critical maintenance reliability and operational effectiveness issues. Sustainment of existing NC3 capabilities remains crucial as the Air Force modernizes the overall system of systems and enterprise-wide architecture.

Sustainment, modernization, and recapitalization of the Nuclear Enterprise and NC3 systems is a top Air Force priority, and consequently the Air Force is investing heavily in NC3 capabilities.

Existing modernization programs address the highest priority needs: providing the President situational awareness in a crisis, connecting the President to advisors and commanders for decisions involving the potential use of nuclear weapons, and disseminating nuclear execution orders to forces. While the Fiscal Year 2020 President's budget addressed the highest NC3 enterprise priorities in response to the NPR, successful sustainment, modernization, and recapitalization require enduring focus and investment to ensure the Air Force delivers reliable NC3 capabilities in support of a safe, secure, and effective U.S. nuclear deterrent. Transformation of the NC3 enterprise is underway, but persistent effort is required to see modernization and recapitalization through to completion.

Conclusion

The U.S. nuclear triad is the foundation of American national security. The capabilities of the triad allow it to survive adversary attacks and defenses. These weapons hold high value targets at risk and provide a diverse range of response options to the President. The complimentary nature of the triad influences the adversary's decision-making calculus, forcing them to consider the possibility of a second-strike response. This range of options ensures the credibility of the U.S. deterrent and limits nuclear options to our adversaries, in effect raising their own nuclear threshold and reinforcing restraint. Eliminating any leg of the triad would greatly ease adversary attack planning and allow an adversary to concentrate resources and attention on defeating the remaining two legs. Given the criticality of effective U.S. nuclear deterrence to the assurance of allies, and, most importantly, the safety and security of the American people and our way of life, we view these programs as both necessary and affordable. The American public, Congress and the Executive Branch must continue to support the triad, as the tools the warfighter needs to provide the options the Nation and the President require.

Lieutenant General Richard M. Clark

Lt. Gen. Richard M. Clark is Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, Arlington, Virginia. General Clark 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.

General Clark graduated from the U.S. Air Force Academy in 1986. His commands include the 34th Bomb Squadron, Ellsworth Air Force Base, South Dakota, 12th Flying Training Wing, Randolph AFB, Texas, 8th Air Force and Joint Functional Component Commander for Global Strike, Offutt AFB, Nebraska. He has also served as the Vice Commander, 8th Air Force, Barksdale AFB, Louisiana, and Commandant of Cadets, U.S. Air Force Academy, Colorado Springs, Colorado. Prior to his current assignment, he served as the Commander, 3rd Air Force, Ramstein Air Base, Germany.

EDUCATION

1986 Bachelor of Science, Management, U.S. Air Force Academy, Colorado Springs, Colo.
 1991 Squadron Officer School, Distinguished Graduate, Maxwell Air Force Base, Ala.
 1994 Master of Arts, Human Resource Development, Webster University, St. Louis, Mo.
 1996 U.S. Air Force Weapons School, Distinguished Graduate, Ellsworth AFB, S.D.
 1998 Master of Strategic Studies, Naval Command and Staff College, Distinguished Graduate, Naval War College, Newport, R.I.
 1999 Master of Airpower Studies, School of Advanced Air and Space Studies, Maxwell AFB, Ala.
 2005 Master of National Security Studies, National War College, Distinguished Graduate, Fort Lesley J. McNair, Washington, D.C.

ASSIGNMENTS

May 1986-February 1987, Junior Varsity Football Coach and Candidate Counselor, U.S. Air Force Academy, Colorado Springs, Colo.
 February 1987-February 1988, Student, Undergraduate Pilot Training, Laughlin Air Force Base, Texas
 February 1988-November 1991, EC-135 Pilot, 2nd Airborne Command and Control Squadron, Offutt AFB, Neb.
 November 1991-November 1994, B-1 Pilot, 28th Bomb Squadron, McConnell AFB, Kan.
 November 1994-July 1997, B-1 Instructor Pilot, B-1 Flight Training Unit, 28th BS, Dyess AFB, Texas
 July 1997-June 1998, Student, Naval Command and Staff College, Naval War College, Newport, R.I.
 June 1998-June 1999, Student, School of Advanced Air and Space Studies, Maxwell AFB, Ala.
 June 1999-August 2000, Action Officer, Air Force Office of Legislative Liaison, the Pentagon, Arlington, Va.
 August 2000-August 2001, Fellow, President's Commission on White House Fellowships, Washington, D.C.
 August 2001-May 2002, Assistant Director of Operations, 77th BS, Ellsworth AFB, S.D.
 May 2002-May 2004, Commander, 34th BS, Ellsworth AFB, S.D.
 May 2004-June 2005, Student, National War College, Fort Lesley J. McNair, Washington, D.C.
 June 2005-January 2006, Vice Commander, 12th Flying Training Wing, Randolph AFB, Texas
 January 2006-March 2008, Commander, 12th FTW, Randolph AFB, Texas
 April 2008-April 2009, Director, Joint Interagency Task Force - Iraq, Multi-National Force - Iraq, Baghdad, Iraq
 May 2009-July 2010, Vice Commander, 8th Air Force (Air Forces Strategic), Barksdale AFB, La.
 July 2010-August 2012, Commandant of Cadets, U.S. Air Force Academy, Colorado Springs, Colo.
 August 2012-August 2014, Senior U.S. Defense Official; Chief, Office of Military Cooperation; and Defense Attaché, Cairo, U.S. Central Command, Cairo, Egypt.
 August 2014-April 2015, Vice Commander, Air Force Global Strike Command, Barksdale AFB, La.

April 2015–October 2016, Commander, 8th Air Force (Air Forces Strategic), Barksdale AFB, La., and Joint Functional Component Commander for Global Strike, U.S. Strategic Command, Offutt AFB, Neb.
 October 2016–October 2018, Commander, 3rd Air Force, Ramstein Air Base, Germany.
 October 2018–present, Deputy Chief of Staff, Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS

April 2008–April 2009, Director, Joint Interagency Task Force - Iraq, Multi-National Force - Iraq, Baghdad, Iraq as a colonel.
 August 2012–August 2014, Senior U.S. Defense Official; Chief, Office of Military Cooperation; and Defense Attaché, Cairo, U.S. Central Command, Cairo, Egypt, as a brigadier general.
 April 2015–October 2016, Joint Functional Component Commander for Global Strike, U.S. Strategic Command, Offutt AFB, Neb., as a major general.

FLIGHT INFORMATION

Rating: command pilot
 Flight hours: more than 4,200
 Aircraft flown: B-1, EC-135, KC-135, T-1, T-38, T-6 and C-21

MAJOR AWARDS AND DECORATIONS

Distinguished Service Medal with oak leaf cluster
 Defense Superior Service Medal
 Legion of Merit with oak leaf cluster
 Distinguished Flying Cross
 Bronze Star Medal with oak leaf cluster
 Meritorious Service Medal with two oak leaf clusters
 Air Medal with two oak leaf clusters
 Aerial Achievement Medal
 Air Force Commendation Medal with oak leaf cluster
 Combat Action Medal
 Nuclear Deterrence Operations Service Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 28, 1986
 First Lieutenant May 28, 1988
 Captain May 28, 1990
 Major Sept. 1, 1997
 Lieutenant Colonel May 1, 2000
 Colonel Aug. 1, 2004
 Brigadier General Nov. 18, 2009
 Major General June 4, 2013
 Lieutenant General Oct. 21, 2016

(Current as of February 2019)

Lieutenant General Arnold W. Bunch Jr.

Lt. Gen. Arnold W. Bunch, Jr., is the Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition, the Pentagon, Washington, D.C. He is responsible for research and development, test, production, and modernization of Air Force programs worth more than \$32 billion annually.

General Bunch was commissioned in 1984 as a graduate of the U.S. Air Force Academy. He completed undergraduate pilot training in 1985. He completed operational assignments as an instructor, evaluator and aircraft commander for B-52 Stratofortresses. Following graduation from the Air Force Test Pilot School, General Bunch conducted developmental testing in the B-2 Spirit and B-52 and served as an instructor in each. Additionally, he has commanded at the squadron, group and wing levels. Prior to his current assignment, he was the Commander of the Air Force Test Center, headquartered at Edwards Air Force Base, California.

EDUCATION

1984 Bachelor of Science degree in civil engineering, U.S. Air Force Academy, Colorado Springs, Colo.
 1991 Squadron Officer School, Maxwell AFB, Ala.
 1994 Master of Science degree in mechanical engineering, California State University Fresno
 1996 Army Command and General Staff College, Fort Leavenworth, Kan.
 2000 Master of Science degree in national security strategy, National War College, Fort Lesley J. McNair, Washington, D.C.

ASSIGNMENTS

1. July 1984 - July 1985, Student, undergraduate pilot training, Columbus Air Force Base, Miss.
2. August 1985 - December 1985, Student, B-52 Combat Crew Training School, Castle AFB, Calif.
3. January 1986 - June 1990, Standardization and Evaluation Instructor Aircraft Commander, 325th Bomb Squadron, Fairchild AFB, Wash.
4. July 1990 - June 1991, Student, USAF Test Pilot School, Edwards AFB, Calif.
5. July 1991 - June 1992, Test Pilot, 6512th Test Squadron, Edwards AFB, Calif.
6. July 1992 - June 1995, Test Pilot, 420th Test Squadron, Edwards AFB, Calif.
7. June 1995 - June 1996, Student, Army Command and General Staff College, Fort Leavenworth, Kan.
8. July 1996 - July 1999, Chief, B-1 Test and Evaluation, B-1 System Program Office, Wright-Patterson AFB, Ohio
9. August 1999 - June 2000, Student, National War College, Fort Lesley J. McNair, Washington, D.C.
10. June 2000 - July 2002, Commander, 419th Flight Test Squadron, Edwards AFB, Calif.
11. August 2002 - April 2003, Chief, Senior Officer Management, Air Force Materiel Command, Wright-Patterson AFB, Ohio
12. April 2003 - June 2004, Deputy Chief, Combat Forces Division, the Pentagon, Washington, D.C.
13. June 2004 - January 2006, Director, Munitions Directorate, Air Force Research Laboratory, Eglin AFB, Fla.
14. January 2006 - May 2008, Commander, 412th Test Wing, Edwards AFB, Calif.
15. June 2008 - March 2010, Vice Commander, Air Armament Center, Eglin AFB, Fla.
16. March 2010 - June 2011, Director and Program Executive Officer for the Fighters and Bombers Directorate, Aeronautical Systems Center, Wright-Patterson AFB, Ohio
17. June 2011 - June 2012, Commander, Air Force Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio
18. June 2012 - June 2015, Commander, Air Force Test Center, Edwards AFB, Calif.
19. June 2015 - present, Military Deputy, Office of the Assistant Secretary of the Air Force (Acquisition)

FLIGHT INFORMATION

Rating: command pilot
 Flight hours: more than 2,500 hours
 Aircraft flown: B-52, B-2, KC-135, F-16, T-38 and others

MAJOR AWARDS AND DECORATIONS

Legion of Merit with two oak leaf clusters
Meritorious Service Medal with five oak leaf clusters
Aerial Achievement Medal with oak leaf cluster
Air Force Commendation Medal
Air Force Achievement Medal
Combat Readiness Medal
National Defense Service Medal with oak leaf cluster
Global War on Terrorism Service Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 30, 1984
First Lieutenant May 30, 1986
Captain May 30, 1988
Major Dec. 1, 1995
Lieutenant Colonel Sept. 1, 1998
Colonel June 1, 2004
Brigadier General May 7, 2010
Major General Aug. 23, 2013
Lieutenant General June 24, 2015

(Current as of June 2015)

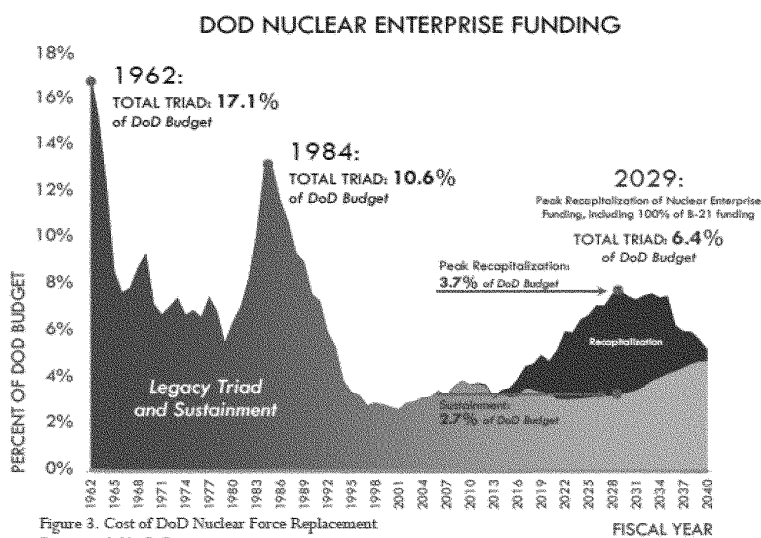
**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

MARCH 28, 2019

RESPONSE TO QUESTIONS SUBMITTED BY MR. BISHOP

General HYTEN. As outlined in the 2018 NPR, current estimates show that maintaining and operating the current nuclear forces requires between 2% and 3% of the DOD budget. To recapitalize/modernize the nuclear enterprise it is projected to be another 4%. At its highest peak in 2029, it is estimated to be 6.4% of the overall DOD budget.

Below chart provided from the Nuclear Posture Review to show nuclear enterprise funding to 2040.



[See page 13.]

RESPONSE TO QUESTIONS SUBMITTED BY MR. LAMBORN

Admiral WOLFE. The FY 2020 Department of Navy Conventional Prompt Strike request is \$593 million and supports the following: 1) Flight Experiment 2, 2) booster development, and 3) platform integration studies. The Navy defers to OSD to provide the overarching DOD hypersonics FY 2020 budget request. [See page 20.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 28, 2019

QUESTIONS SUBMITTED BY MRS. DAVIS

Mrs. DAVIS. Why do you believe Russia possesses a large NSNW force? How does this force affect U.S. national security? Has DOD considered utilizing negotiations to reduce this force; have you approached Russia about lowering its NSNW numbers?

Mr. TRACHTENBERG. After the Cold War, Russia retained, and is now modernizing, its large NSNW force because it provides Russia a strategic advantage vis-a-vis the United States and NATO. The 2018 Nuclear Posture Review identified this as a potential vulnerability in deterrence as it indicates Russia's mistaken belief that it could use NSNW forces to achieve its objectives in a conflict with the United States and our NATO Allies. The tremendous disparity in NSNW forces between the United States and Russia makes it very difficult to negotiate reductions and Russia has shown little interest in doing so.

Mrs. DAVIS. Have you ever had a discussion with Russia about their nuclear posture, and in particular an escalate-to-de-escalate (E2D) strategy, which the Nuclear Posture Review claims is part of Russia's nuclear doctrine? How did they respond? Do you view this doctrine as offensive or defensive in nature?

General HYTEN. I would like to have such a discussion, but I have never had a conversation with Russia about their nuclear posture.

"Escalate to deescalate" is an outdated term from Russian academic writings dating back to the 1990's. What we know from these same academic and military journals, is Russian thought has evolved into "escalation dominance" or, more aptly, "escalate to win." This doctrine is offensive in nature and possibly encourages preemptive nuclear use.

Mrs. DAVIS. During your testimony you noted that funding for the W76-2 low yield warhead was not requested in OCO-for-Base. Would you confirm that this is the case and describe, in detail, where funding for W76-2 deployment is requested? If it was requested in OCO-for-Base, why would the administration do so?

Admiral WOLFE. The PB20 Budget Request for the Department of the Navy includes funding for the deployment of the W76-2 warhead. The Navy has requested \$19.6 million for this effort. All of this money is included under the line item for TRIDENT II Mods. The entire line item (net total of \$1,177.251 million) is part of the OCO-for-Base request. The Budget requests OCO for base requirements in support of the National Defense Strategy. The Budget requests these funds in OCO to comply with the budget base defense caps included in the Budget Control Act of 2011.

QUESTION SUBMITTED BY MR. WILSON

Mr. WILSON. The Nuclear Posture Review provides a framework for modernizing the nuclear triad. Can you discuss the role and importance of developing plutonium pits in nuclear modernization and how it impacts deterrence?

General HYTEN. Plutonium pits are the nuclear triggers, which allow our weapons to function.

The current pits have been in the stockpile for decades and are approaching their end-of life. Although we still have confidence in these complex material systems, it is essential the pits be replaced before we have used all available margin. We are approaching that point; however it is difficult to know exactly when it might occur. And while plutonium does have a long half-life, it is part an exquisitely engineered pit, with many other materials.

Assessments on plutonium pit production requirements are based upon the age of the stockpile and an understanding of plutonium pit/primary aging at the time of the assessment. We are now over a decade later from the 50-80 ppy assessment. During this time period the stockpile continued to age and our understanding of the effects of aging on plutonium pits/Primary assemblies improved. The net result is the requirement for at least 80 pits per year by 2030, synchronized with planned warhead modernization programs.

Past decisions to delay, defer, or cancel programs to recapitalize plutonium pit manufacturing have forced us into this "just in time" replacement scenario and in-

creased the rate at which we must replace the aging plutonium components in the stockpile. Continuing to delay progress on recapitalizing pit manufacturing will only further increase and require us to produce even more plutonium pits annually for the stockpile in order to ensure the continued safety, security and effectiveness of our fielded systems.

“At least 80 pits per year” means the National Nuclear Security Administration must be able to produce a minimum of 80 pits per year for the stockpile to meet nuclear modernization requirements. The U.S. requires this sustained plutonium manufacturing capability of at least 80 pits per year by 2030 to address known aging concerns, support projected stockpile modernization programs, and maintain a minimal capability to respond in a timely manner to future uncertainty. Failure to achieve this level of production will introduce additional risk to sustaining an effective nuclear deterrent. It is not a matter of if, but when we will exceed the point where we are no longer confident the weapon will operate reliably as designed.

QUESTIONS SUBMITTED BY MR. LARSEN

Mr. LARSEN. What is the State Department’s contribution to OSD–P’s thinking on arms control issues in the interagency process, and in how you view treaty effectiveness, compliance, and implementation activities?

Mr. TRACHTENBERG. We work very closely with the State Department on arms control, verification, and compliance issues, both directly and through the interagency process. The State Department is a valued partner. It leads a number of interagency working groups that continually assess the compliance of our arms control partners and oversee interagency coordination of U.S. implementation policy, culminating in coordination and publication of its annual Arms Control Compliance Report. State Department further coordinates the interagency’s collective efforts to keep our allies informed of our current and future arms control efforts. In particular, it was key to helping build diplomatic support both for NATO’s declaration of Russia’s material breach of the INF Treaty, and for the U.S. suspension of its obligations under the INF Treaty.

Mr. LARSEN. Do you view China as a more important strategic competitor than Russia in the long run? How would China react politically and in nuclear doctrine to New START expiring, and the U.S. and Russian nuclear forces being completely unconstrained? Is this more or less likely to lead to China expanding its nuclear force? Would New START keeping constraints on and insights into Russia’s nuclear forces make your deterrence mission for China easier or harder?

General HYTEN. Long term strategic competitions with both China and Russia are the principal priorities for the Department. That said, China’s pursuit of regional dominance is the major challenge to U.S. interests in Asia.

China may place some value on New START as it limits the strategic offensive arsenals of both the U.S. and Russia.

However regardless of New START, China is advancing a comprehensive modernization program which includes the continued development and deployment of a nuclear triad combined with anti-access/area denial (A2/AD) and power projection operations—and it is expected to remain on this path well into the future.

China continues to increase the number and capabilities of its nuclear forces and its lack of transparency regarding the scope and scale of its nuclear modernization makes predictions of its future intent problematic.

The Nuclear Posture Review provides a tailored U.S. strategy for China which is not predicated upon insights into Russia’s nuclear forces. Hence, I would not expect our deterrence mission for China to be affected by the New START Treaty with Russia.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. Recently, the requirements for plutonium pit production have led to an increase in planned production from up to 50–80 pits, to “at least 80 pits” per year. Can you give the Congress clarity on why the number of pits per year has increased, and what exactly the administration means by “at least 80 pits per year”?

General HYTEN. Assessments on plutonium pit production requirements are based upon the age of the stockpile and an understanding of plutonium pit/primary aging at the time of the assessment. We are now over a decade later from the 50–80 ppy assessment. During this time period the stockpile continued to age and our understanding of the effects of aging on plutonium pits/Primary assemblies improved. The net result is the requirement for at least 80 pits per year by 2030.

Past decisions to delay, defer, or cancel programs to recapitalize plutonium pit manufacturing have forced us into this “already late-to-need” replacement scenario and increased the rate at which we must replace the aging plutonium components in the stockpile. Continuing to delay progress on recapitalizing pit manufacturing will only further increase and require us to produce even more plutonium pits annually for the stockpile in order to ensure the continued safety, security and effectiveness of our fielded systems.

“At least 80 pits per year” means the National Nuclear Security Administration must be able to produce a minimum of 80 pits per year for the stockpile to meet nuclear modernization requirements. The U.S. requires this sustained plutonium manufacturing capability of at least 80 pits per year by 2030 to address known aging concerns, support projected stockpile modernization programs, and maintain a minimal capability to respond in a timely manner to future uncertainty. Failure to achieve this level of production will introduce additional risk to sustaining an effective nuclear deterrent. It is not a matter of if, but when we will exceed the point where we are no longer confident the weapon will operate reliably as designed.

Mr. GARAMENDI. Absent Russia materially breaching the New START Treaty, do you see any reason for the United States to withdraw from the treaty before it expires in 2021?

General HYTEN. No. The New START Treaty’s verification regime (i.e., on-site inspections, database exchanges, notifications) provides transparency into Russian strategic offensive capabilities, contributing to our understanding of their nuclear force structure and pace of modernization.

However, New START does not cover the weapons Russia is developing outside of the treaty and my desire is to have all nuclear weapons as part of a future strategic arms treaty.

QUESTIONS SUBMITTED BY MS. SPEIER

Ms. SPEIER. Absent Russia materially breaching the New START Treaty, do you see any reason for the United States to withdraw from the treaty before it expires in 2021?

General HYTEN. No. The New START Treaty’s verification regime (i.e., on-site inspections, database exchanges, notifications) provides transparency into Russian strategic offensive capabilities, contributing to our understanding of their nuclear force structure and pace of modernization.

However, New START does not cover the weapons Russia is developing outside of the treaty and my desire is to have all nuclear weapons as part of a future strategic arms treaty.

Ms. SPEIER. If New START were to expire, how would your advice to the President change regarding the current U.S. nuclear force posture? How would your military planning change, including your responses to Russia potentially increasing the number of nuclear weapons pointed at the United States, after 2021?

General HYTEN. Regardless if New START were to expire or not, my advice to the President would not materially change.

New START is beneficial to STRATCOM. The New START Treaty’s verification regime (i.e., on-site inspections, database exchanges, notifications) provides transparency into Russian strategic offensive capabilities, contributing to our understanding of their nuclear force structure and pace of modernization. I believe in any situation I can foresee in the next 10 years I can provide an effective defense as long as I have a capable triad with the weapons that we’ve defined. Beyond ten years I have concerns regarding weapon development outside of New START. Without a verifiable and comprehensive arms control treaty it is difficult to understand where Russia is going in developing torpedoes, cruise missiles, and hypersonics. Likewise, if Russia goes in a different direction it would be harder to identify this shift.

While it is difficult to predict with any certainty whether Russia would increase their strategic nuclear weapon stockpile outside of a New START agreement, I think the impacts would probably be more geopolitical in nature and unlikely to drive significant changes in U.S. force structure.

Our comprehensive deterrence strategy as defined in the NPR includes the force structure and stockpile to hedge against prospective and unanticipated risks. A fully modernized nuclear Triad, including requisite NC3 and supplemental capabilities, provide the diversity and flexibility to tailor U.S. strategies for effective deterrence as the geopolitical landscape evolves.

QUESTIONS SUBMITTED BY MR. KEATING

Mr. KEATING. At the Munich Security conference in mid-February, Polish foreign minister Jacek Czaputowicz stated the following: “We are not very much in favor—we are definitely even against—deployment of [INF Treaty prohibited] missiles on our soil. But we will work out the solution with our allies in NATO because it must be united response to Russian threat in that case... If we do it maybe [host new missiles] it will be a decision of all the alliance.”

Do you agree that any decision to base U.S. ground-launched intermediate-range missiles should only be considered if it is supported by “all of the alliance”? Has the Pentagon begun conversations with any alliance members about hosting INF-range missiles on their territory? Will the administration commit to briefing Congress on plans for the potential basing of INF range missiles outside the United States?

Mr. TRACHTENBERG. We expect to work closely with allies in determining the appropriate response to Russia’s evolving military posture, including its deployment of the INF Treaty-prohibited, dual-capable SSC-8 missile. This response could very well entail deployment of conventional ground-launched intermediate range systems, when such systems are ready, if we believe they contribute to NATO’s deterrence and defense posture. We will keep Congress informed as we proceed with development.

Mr. KEATING. General Hyten’s testimony before the committee noted that:

“Russia is also developing and intends to deploy novel strategic nuclear weapons, like its nuclear-armed, nuclear-powered underwater unmanned vehicle and intercontinental-range cruise missile, which Russia seeks to keep outside of existing arms control agreements.”

Given the administration’s stated commitment to verifiable and enforceable arms control efforts that advance U.S. and allied security, please describe in detail the administration’s efforts to constrain Russia’s new nuclear systems systems. Does the administration have a plan to address these new systems through negotiations with Russia? Has the administration made any progress in constraining these systems? Please provide dates of all discussions, including interagency discussions, with Russia where such systems were discussed, and at what level they were held, since the beginning of the administration.

Mr. TRACHTENBERG. We are very concerned about the enormous investments Russia is making in nuclear forces that are not captured by existing arms control agreements, including its increasingly capable NSNW arsenal and several of the “novel” systems General Hyten referred to in his testimony. We have raised our concerns with Russia regarding its new novel systems through diplomatic channels, including during three sessions of the New START Treaty’s Bilateral Consultative Commission. Going forward, any future arms control regime must account for these systems in some manner.

Mr. KEATING. In NATO’s statement after the administration’s announcement to suspend implementation of the INF Treaty, the Alliance reiterated its commitment to “committed to the preservation of effective international arms control, disarmament, and non-proliferation.” How would the absence of any strategic arms control limitations and an unconstrained Russia complicate Alliance cohesion, and in particular NATO nuclear planning?

Mr. TRACHTENBERG. The consensus 2018 Brussels Summit Declaration makes clear that allies remain open to arms control, with the aim of improving the security of the Alliance, taking into account the prevailing international security environment, but that the conditions for achieving further disarmament goals have not become more favorable in the last several years. Although this situation is regrettable, the Alliance has maintained cohesion in the face of Russian behavior that has impeded progress on arms control (e.g., Russia’s suspension of the Conventional Forces in Europe (CFE), and Russia’s effective termination of the INF Treaty). In the presence of such uncertainty, the Brussels Summit Declaration also points out that NATO continues to adapt in order to ensure that its deterrence and defense posture remains credible, coherent, resilient and adaptable to a changing security environment, and that it has taken steps to ensure its nuclear deterrent remains safe, secure, and effective.