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HEARING

ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2019

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON STRATEGIC FORCES HEARING

ON

U.S. STRATEGIC FORCES POSTURE AND THE FISCAL YEAR 2019 BUDGET REQUEST

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HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, March 7, 2018.

The subcommittee met, pursuant to call, at 3:29 p.m., in room 2118, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MIKE ROGERS, A REPRESENTATIVE FROM ALABAMA, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. ROGERS. This hearing of the Strategic Forces Committee of the House Armed Services will come to order.

I want to ask unanimous consent that Mr. Carbajal be allowed to sit on this hearing since he is a member of the full HASC [House Armed Services Committee].

Without objection, so ordered.

We are pleased today to have two witnesses with us, General John Hyten, Commander, U.S. Strategic Command, no stranger to this subcommittee; and a newer one, Mr. John Rood, Under Secretary for Defense Policy.

Thank you both for testifying and being here with us today. We know it takes a lot of time to get ready for these hearings, and we appreciate the time you put into it and your service to our country.

What we are going to do, because we are going to be called for votes at 4 o'clock—Jim and I are going to—the ranking member and I are going to submit our opening statements for the record so that we can go directly to questions if that is okay with you all.

Without objection, so ordered.

And what I will do is I will ask either one of you, who wants to start first with your opening statement? And we will recognize Mr. Rood for your opening statement.

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

STATEMENT OF HON. JOHN C. ROOD, UNDER SECRETARY OF DEFENSE FOR POLICY, DEPARTMENT OF DEFENSE

Secretary ROOD. Thank you, Mr. Chairman, Ranking Member Cooper, distinguished members of the committee. Thank you for the opportunity to testify on the President's fiscal year 2019 budget request for strategic forces.

In terms of the security environment and strategic priorities, I will just briefly summarize that.

Today the United States faces an increasingly complex global security environment in which the central challenge to our prosperity and security is the reemergence of long-term strategic competition by revisionist powers in China and Russia.

While they pose separate challenges with unique attributes, both China and Russia seek to reshape the world order and change territorial borders. Consequently, they pose increasing security threats to us, our allies, and our partners.

Long-term competition with China and Russia requires increased U.S. and allied military investment, because of the magnitude of the threats they pose today and the potential that these threats will increase in the future.

We must also simultaneously strengthen our efforts to deter and counter the clear and present dangers posed by rogue regimes such as North Korea and Iran.

The U.S. military remains the strongest in the world. However, our advantages are eroding as potential adversaries modernize and build up their conventional and nuclear forces. They now field a broad arsenal of advanced missiles, including variants that can reach the American homeland.

For example, only last week Russian President Putin claimed publicly that Russia now possesses unprecedented new types of nuclear forces with which to target the U.S. and our allies.

While this picture is unsettling and clearly not what we desire, as Secretary of Defense Mattis has pointed out, quote, "We must look reality in the eye and see the world as it is, not as we wish it to be," end quote.

The administration has heeded this admonition in our recent strategic reviews: the National Security Strategy, the National Defense Strategy, and the Nuclear Posture Review. They reflect a consistent and pragmatic assessment of threats and uncertainties we face regarding the future security environment.

Our task at the Defense Department is to ensure that the U.S. military advantages endure and, in combination with other elements of national power, that we are fully able to meet the increasing challenges to our national security.

Weakness invites challenges and provocation, but as both George Washington and Thomas Jefferson observed, American strength deters war and promotes peace. It also assures our allies and attracts new partners.

Strengthening our alliances and attracting new partners is a critical element of retaining our advantages. As the National Defense Strategy points out, quote, "Mutually beneficial alliances and partnerships are crucial to our strategy, providing a durable, asymmetric advantage that no competitor or rival can match. This approach has served the United States well in peace and war," end quote.

The 2018 Nuclear Posture Review reflects DOD's [Department of Defense's] strategic priority to maintain a safe, secure, survivable, and effective nuclear deterrent. The logic of the NPR [Nuclear Posture Review] was best articulated by Secretary Mattis when he said, quote, "This review rests on a bedrock truth: Nuclear weapons have and will continue to play a critical role in deterring nuclear attack and preventing large-scale conventional warfare between

nuclear-armed states for the foreseeable future. U.S. nuclear weapons not only defend our allies against conventional nuclear threats, they also help them avoid the need to develop their own nuclear arsenals. This in turn furthers global security," end quote.

Effective deterrence is critical to our security, and in a complex and dynamic security environment there is no one-size-fits-all approach to deterrents. The requirements for effective U.S. deterrence can vary greatly depending on the perceptions, goals, interests, strengths, strategies, and vulnerabilities of different potential adversaries.

The deterrent strategy effective against one potential adversary may not deter another. Consequently, the 2018 NPR calls for the United States to tailor deterrence as necessary across a spectrum of adversaries, threats, and contexts.

The 2018 NPR confirms the findings of all previous NPRs that the diverse capabilities of the nuclear triad provide the flexibility and resilience needed for deterrence. Unfortunately, each leg of the triad is now operating far beyond its originally planned service life. Consequently, we must not delay the recapitalization of the triad initiated by the previous administration.

We're off to a good start. The 2019 budget request funds all critical Defense Department 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 fiscal year 2019 budget request for nuclear forces is $24 billion, which includes $11 billion for nuclear force sustainment and operations; $7 billion for recapitalization programs, including the LRSO [Long Range Standoff Weapon], B–21, GBSD [Ground Based Strategic Deterrent], and *Columbia*-class SSBN [ballistic missile submarine]; and $6 billion for nuclear command, control, and communications.

In addition, the President's budget request includes two supplemental capabilities to enhance deterrence against emerging challenges in the near- and mid-term. The Department requests funds to modify a small number of existing SLBM [submarine-launched ballistic missile] warheads to provide a low-yield ballistic missile option in the near-term.

We also request funds to initiate an analysis of the performance requirements and costs to pursue a modern nuclear-armed sea-launched cruise missile that could be available in the mid-term.

These proposed supplements would contribute to deterrence by raising the threshold for nuclear use. They would do so by denying potential adversaries confidence that their coercive threats of limited nuclear first use or actual first use can provide a useful advantage over us and our allies.

These supplements do not and are not intended to mimic adversary nuclear capabilities. They can nonetheless help address the imbalance in U.S. and Russian non-nuclear strategic forces and create incentives for Russia to return to compliance with its nuclear arms control commitments.

The U.S. commitment to nonproliferation and arms control remains strong. The U.S. remains committed to all of our obligations under the Nuclear Non-Proliferation Treaty, including Article VI. We will continue to use arms control measures like the New

START [Strategic Arms Reduction] treaty, nonproliferation measures, and counter-nuclear terrorism measures to advance the security of the United States and our allies and partners.

Let me now turn to missile defense. The Department's fiscal year 2019 budget request supports the President's directions as set out in the National Security Strategy to develop a layered missile defense system to protect the American homeland from North Korean and Iranian missile threats. Our missile defense system not only protects the American people, it strengthens deterrence of war and assurance of allies.

Today, the Ground-based Midcourse Defense [GMD] system provides this protection for the U.S. homeland. It consists of 44 ground-based interceptors [GBI] deployed in Alaska and California; land-, sea-, and space-based sensors; and a command and control system.

We are strengthened in this GMD system and investing in technologies to ensure that we can continue to counter rogue state missile threats to our homeland. Doing so is one of our highest priorities.

For this purpose, last September DOD requested the reprogramming of fiscal year 2017 funding of over $400 million to counter the North Korean missile threat. Congress approved this request.

A portion of these funds support important homeland defense activities, including initiating work on the procurement of 20 additional ground-based interceptors in Alaska as early as 2023, which will bring the total to 64 fielded interceptors. The reprogramming also funded a service life extension to the COBRA DANE radar in Alaska and software upgrades to the Sea-Based X-band radar.

In November, the President submitted an amendment to his fiscal year 2018 budget request for $4 billion for homeland and regional missile defense, which included construction of a new missile field at Fort Greely, Alaska, and additional procurement for 20 additional GBIs.

The fiscal year 2019 budget request includes $9.9 billion for the Missile Defense Agency and $3 billion for air and missile defense activities in the military services. The budget includes funding for a more capable GBI with the Redesigned Kill Vehicle, the deployment of new missile tracking and discrimination sensors in Alaska, Hawaii, and the Pacific region, and a new Space-based Kill Assessment capability.

We are also moving forward to bolster homeland defenses against air and cruise missile threats. In 2018, we will complete the first part of a two-phase effort to provide surveillance against these threats for the National Capital Region. Doing so will enhance our ability to detect, track, and investigate suspicious aircraft, as well as cruise missiles, and when necessary, cue our missile defense systems.

We are on track to complete the second phase of this effort in fiscal year 2019. We are also looking into technologies and concepts that could be used to provide scalable and deployable options for the rest of North America.

The Department's fiscal year 2019 budget request also continues deployment of regional missile defenses tailored to meet threats to U.S. forces abroad, allies and partners in Europe, the Middle East,

and the Asia-Pacific region. The budget seeks to enhance our regional missile defense capability through additional Patriot, THAAD [Terminal High Altitude Area Defense], and SM–3 [Standard Missile-3] Block IB and IIA interceptors.

Because systems such as Patriot and THAAD and our Aegis ballistic missile defense capable ships can be surged when and where required, they make it possible to deploy layered missile defense capabilities that are responsive to regional missile threats as they arise.

We are encouraging our allies and partners to acquire missile defense capabilities and to strengthen cooperation and interoperability. We are pleased with the progress at NATO [North Atlantic Treaty Organization] to build greater missile defense capabilities and important collaborative efforts with allies in the Middle East and Asia.

Potential adversaries are modernizing and expanding their missile capabilities. We must ensure, therefore, our missile defense investment strategy and priorities enable us to meet the most dangerous threats we face today, while also enabling us to counter future missile threats as they expand.

Areas for work on advanced technology include improved discrimination in our missile defense system sensor architecture, lasers to intercept offensive missiles during their most vulnerable boost phase of flight, and the multi-object kill vehicle.

With respect to our space policy and posture, let me say U.S. space systems are essential to our prosperity, security, and way of life; and DOD's space capabilities are critical for effective deterrence, defense, and U.S. force projection capabilities. Consequently, DOD must be prepared to address threats to our national security assets located in space.

Due to the critical importance of these assets, the National Security Strategy states, quote, "Any harmful interference with or an attack upon critical components of our space architecture that directly affects this vital U.S. interest will be met with a deliberate response at a time, place, manner, and domain of our choosing," end quote.

The President's fiscal year 2019 budget request includes $12.5 billion to take steps to establish a more resilient, defendable space architecture. This is an increase of $1.1 billion from the fiscal year 2018 budget request.

The United States, however, I would add, does not fight alone. Bringing together our allies and partners to share capabilities and information strengthens deterrence and defense. Cost-sharing agreements, hosting U.S. national security payloads on foreign systems, and data-sharing arrangements to bolster shared space situational awareness are just a few of the opportunities that our allies and partners provide.

Mr. Chairman, let me conclude by stating that in this increasingly complex and threatening security environment the Defense Department must sustain the capabilities needed to deter and defend against attacks on our homeland, U.S. forces deployed abroad, allies and partners. We must make the investments needed to address the ongoing erosion of our advantages and remain the preeminent military power in the world.

Along with our allies and partners we must ensure that we have the capabilities needed now and in the future to protect our people and the freedoms we so cherish, and are able to engage potential adversaries diplomatically from a position of strength. To do so, I urge you to support the important capabilities funded in the President's fiscal year 2019 budget request.

Thank you, Mr. Chairman, for the opportunity to be here before you today.

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

Mr. ROGERS. Thank you.

General Hyten, you are recognized for your opening statement.

STATEMENT OF GEN JOHN E. HYTEN, USAF, COMMANDER, U.S. STRATEGIC COMMAND

General HYTEN. Thank you, Mr. Chairman, Ranking Member Cooper. It is an honor to be here today with Under Secretary Rood. And it is a continuing privilege to represent the 184,000 Americans that serve the missions of U.S. Strategic Command.

I want to start by thanking this committee for your enduring support for our Nation's defense. And with your approval, I would like my full statement to be made part of the record.

Mr. ROGERS. So ordered.

General HYTEN. So as we begin today, it is important for me to note that although we now have a bipartisan budget act, which is a very significant step to ensuring our future security, we are nonetheless still operating under a continuing resolution which will expire on March the 23rd. So I respectfully request quick action by the Congress to pass a final budget to ensure that our All-Volunteer Force remains fully trained and equipped to meet not only the threats of today, but the emerging threats of the future.

And the first and most important message I want to deliver today is that the forces under my command are fully ready to deter our adversaries and respond decisively should that deterrence fail. We are ready for all the threats that are out there, and no one—no one—should doubt this. We just have to make sure that future STRATCOM [U.S. Strategic Command] commanders will always be able to make that statement.

Because we are a global warfighting command, we set the conditions across the globe. As the ultimate guarantor of our national and allied security, our forces and capabilities underpin and enable all other joint force operations.

We are a global warfighting command. The strength of the command is its people. The soldiers, sailors, airmen, Marines, and civilians of the enterprise have the most important mission in our entire Department. Their hard work and dedication ensure our Nation's strategic capabilities remains safe, secure, reliable, and ready. And sustained congressional support will ensure that we remain ready, agile, and effective for deterring strategic attack, assuring our allies and partners today and in the future.

Secretary Rood already talked about the NPR. He also talked about our modernization. I will defer the comments I have on that to your questions and answers.

So, Mr. Chairman, thank you for the opportunity to be here again today, and I look forward to taking your questions.

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

Mr. ROGERS. Thank you, General Hyten.

Thank you both for being here as we begin to examine the President's fiscal year 2019 budget proposal.

I will recognize myself first for questions.

Under Secretary Rood, many discuss strategic stability in the context of missile defense and the need to be cognizant of how the U.S. actions, development efforts, and deployment of capability can disrupt this balance.

From your perspective, especially in light of the recent statements from Russia regarding their capability to strike the U.S. with a quote, "invincible weapon," close quote, can our missile defense systems be compared to what is being done by Russia and China that threaten this strategic stability?

Secretary ROOD. Mr. Chairman, the missile defense system that the United States has developed and fielded to date would not have the capability to negate the Russian or Chinese strategic nuclear arsenal. That has not been our planning focus and the capabilities developed do not enable us to do that.

I think the statements made by Russian President Putin, while not surprising, were nonetheless disappointing. While we have been aware of the development of Russia's capabilities and watching with concern some of the development that has occurred in terms of Russia's doctrine and their exercise program, it is nonetheless disappointing to see that the President of Russian Federation choose to feature these capabilities in the way that he did.

I think with respect to China, they are developing a very large strategic offensive nuclear force, and so that is of concern. Both countries are pursuing hypersonic weapons and other capabilities and their behavior in the cyber domain and elsewhere concerns us.

All of those things as a piece are concerning and why in the National Defense Strategy we highlighted those two countries as our primary and central focus for our national security efforts going forward.

Mr. ROGERS. Great.

Recently, President Putin announced that Russia was pursuing and fielding four new nuclear weapons because the U.S. refuses to engage in arms control and is developing missile defenses to thwart Russia's strategic forces. Are these reactions to the 2018 NPR or have they been in development for years?

Secretary ROOD. No, you are correct, Mr. Chairman. Those capabilities have obviously been in development for quite some time. President Putin talked about their maturity. They are clearly not capabilities that were developed within the last few months or last year. They have been at work.

With regard to our commitment to arms control, the United States remains committed to our arms control obligations. That remains unchanged. Regrettably, the Russian Federation's track record in terms of its adherence to its arms control obligations leaves a great deal wanting.

As you know, it has been a policy of the United States Government, in the last administration and this, to find that Russia is in violation of its commitments under the INF [Intermediate-Range Nuclear Forces] Treaty, for example. We have seen Russian violations on other agreements.

Nonetheless, we remain committed to our obligations in the New START treaty and prepared to have conversations in this regard with our Russian colleagues. But I think it would be a mistake to assign the development of capabilities that have been at work for many years to any developments that happened in the last few months.

Mr. ROGERS. You made reference in your opening statement to the additional 20 GBIs that we authorized and appropriated money for in this current NDAA [National Defense Authorization Act], which we are all very excited about, because while we did have 44, you know they all aren't available at all times because of work that is having to be done on some of them.

But I am a big believer that that 20 was a good start to where we need to go. I would be curious to know your thoughts and General Hyten's thoughts on the need for more after these 20 are implemented, given the threats around the world and our shot doctrine, which we won't go into.

Secretary ROOD. Yes, sir.

Regrettably, the missile threats that we face around the world, that threat picture is continuing to mature, both in scale and in complexity. It is incumbent on us that we continue to maintain the ability to defend this Nation from those kinds of ballistic missile capabilities in the hands of countries like North Korea and Iran.

And so we have sought, as you noted, in the reprogramming request and the supplemental budget request last year to give a boost to those efforts, and the fiscal year 2019 budget request carries that forward.

It is always—and this is one of the questions we are seeking to answer as part of the Missile Defense Review—what is the best way of doing that? The additional systems, such as the GBIs, measured as well with sensor capabilities and improvements in discrimination, and the robustness of the overall architecture.

And so all of those things working as a system of systems to produce the improvement is what we are trying to optimize. And so clearly greater capability than what the United States possesses today will be required. And the threat is not resting. So we must keep pace with it.

General.

General HYTEN. So I believe you will see the details in the Missile Defense Review shortly. But I have been consistent in my view that we need to continue to monitor the missile defense capabilities that we are building to make sure they respond to the threats that we face. And I believe that prioritization of resources that we have in the future should go along the following construct.

The first thing we need is better sensor capability, better tracking capabilities, to make sure we understand and can characterize and then respond to that threat.

The second piece we need is better kill vehicles on the top of our interceptors, so that those kill vehicles become more and more lethal in terms of their ability to respond.

And then the third thing we need is more capacity.

I think we have to do those three things simultaneously. I think those are the priorities that I have, that I have stated, both in my statement for the record, as well as multiple times over the year. I will continue to be consistent in pushing for those three elements of future missile defense capabilities.

Mr. ROGERS. Okay, great.

My last question is for you, General Hyten. You are known to say that you want to see us go fast, faster than we have been going. And one of the reasons, as I understand it, that the Missile Defense Agency was created was so it could go faster, and it was pulled out from the Department for that reason.

There is discussion now about pulling it back into the Department under the R&E [Research and Engineering] section. I am concerned that that is going to bureaucratize it again and slow it down. What are your thoughts about that?

General HYTEN. So I hate bureaucracy. I hate any additional bureaucracy that causes the Department to go slow.

I don't think the organizational issue is necessarily a concern. I like the authorities the Missile Defense Agency has. And whatever structure we talk about coming out of the Missile Defense Review, we have to make sure that we maintain those authorities to allow it to go fast.

We can still go faster on the missile defense side as well. The one thing I will point out about R&E, though, is that Mike Griffin has now been confirmed to be R&E in the Department of Defense. There is nobody I know that is more technically sound and hates bureaucracy and wants to go fast than Mike Griffin.

So I believe there is a partnership there that can be made. But I would not advocate for lessening the authorities that the Missile Defense Agency has right now.

Mr. ROGERS. Thank you very much.

The Chair recognizes the ranking member for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman. Thank the witnesses.

In view of the number of participants in this hearing and the shortness of time, I am going to defer my question to the closed session. Thank you.

Mr. ROGERS. The Chair now recognize the gentleman from Colorado, Mr. Lamborn.

Mr. LAMBORN. Thank you, Mr. Chairman. Thank you both for being here and the ways that you have served our country.

Thank you, General Hyten, for coming by earlier. It is always good to touch base.

And because of the shortness of the time, like the ranking member said, I am just going to ask one question, and this is for both of you.

We all know that—and you have just addressed it, General Hyten—that we need to have better space sensors. We need to look for other strategic uses of directed energy and things like that so we stay ahead of potential adversaries.

But when I look at the fiscal year 2019 President's budget, I see that those kinds of things are zeroed out. So what is going on there from a funding standpoint?

Secretary ROOD. In terms of what is going on from a funding standpoint for efforts to be zeroed out for directed energies?

Mr. LAMBORN. No. For, well, space sensors in particular and the missile defense tracking system, which is a space-based sensor layer.

General HYTEN. So I will address that, Congressman Lamborn.

So as you look across those pieces, and you talked about the need for increased space sensors and where that is in the 2019 budget, you talked about the need for directed energy pieces.

So concerning the midcourse tracking system, the MTS system, it was in the 2018 supplemental for MDA [Missile Defense Agency], a small number, I think, somewhere over $10 million, to begin the pursuit of that capability. We had that discussion within the Department.

The Department made a decision that what we will do in the 2019 budget, and you will find it actually in the Air Force budget line, under the missile warning sensor technology, a line for $42 million to build demonstration capabilities to explore that piece. That $42 million will go at developing the technology we need for those capabilities.

The second piece of the puzzle, maybe more important, is not a funding issue, and that is the United States Air Force and the Missile Defense Agency this year, under the Department of Defense, have agreed to get together to work out an integrated set of requirements and programs for how we use space and the infrared [IR] element in space, overhead persistent IR, to do all of these missions, and to come into the Department and come into the Congress next year with a fully integrated program to do the missile warning missions, the missile defense missions, the threat characterization missions, all those pieces together.

So that work will be ongoing this year, while at the same time the technology work will be ongoing. Nonetheless, I have advocated for that capability for a long time, 30 years of my life I have advocated. I believe we are ready to go into that. We need to move quickly. I appreciate where the Department is on that. We have to make the decisions this year where we are going in the future.

Mr. LAMBORN. Okay. Thank you so much. I understand better that things are moving forward. My initial impression and my staff needed to be updated, so I really appreciate that. I am glad to see that these efforts are indeed starting to pay off. Thank you.

And I yield back the balance of my time.

Mr. ROGERS. The gentleman yields back.

The Chair now recognizes the gentlelady from California, Mrs. Davis, for any questions you may have.

Mrs. DAVIS. Thank you, Mr. Chairman. I will defer to closed session as well.

Mr. LAMBORN. The Chair now recognize the gentleman from Alabama, Mr. Brooks, for his questions.

Mr. BROOKS. Thank you, Mr. Chairman.

It is always good to see General Hyten, a local boy done well, from Huntsville, Alabama. I don't know if the chairman mentioned that, but I wanted to emphasize it.

Mr. ROGERS. Roll Tide.

General HYTEN. Roll Tide, for the record.

Mr. BROOKS. All right. That works with me. And also, go Duke Blue Devils, since that is my other alma mater. But that doesn't do so well with those Carolina folks.

Mutually assured destruction doctrine, that has kept the peace to a very large degree between the United States and China on the one hand, and the Soviet Union, now Russia, on the other.

With the improvements in technology and capabilities of China and Russia, does the mutually assured destruction doctrine still work or have either China or Russia been able to get to the point where they have been able to overcome that counterthreat that has helped keep the peace?

Secretary ROOD. Congressman, nuclear deterrence remains vitally important to our country. We rely principally on nuclear deterrence to address those kinds of challenges from Russia and China, and certainly to an extent other countries, such as North Korea.

I think the concepts and the fundamentals of nuclear deterrence still hold in this environment, but in the way that we approach those, utilize those fundamental principles, we need to be more supple and more tailored and have a broader range of capabilities in our approach. And the Nuclear Posture Review talks about a tailored approach to deterrence.

For example, we are concerned about some of the doctrine we see emanating from Russia, talking about early escalation, a greater reliance on nuclear capabilities in a conflict, perhaps some mistaken belief that the United States and our allies would not have the ability to respond to those sorts of capabilities.

And so what you see in the Nuclear Posture Review is a recommendation for some supplementary capabilities, because nuclear deterrence is not static and it won't be one-size-fits-all. We have to update our tool kit and be flexible in our application of our principles and our tools to deal with this new environment.

So I think nuclear deterrence still holds and it is still a bedrock principle of our defense capability, but our application of it, we need to adjust ourselves to the new environment we face in order to keep the nuclear threshold high and not allow for some erosion of that.

Mr. BROOKS. Assuming for the moment that we do not update our tool kit, to use your phraseology, how long do you think it would be before the mutually assured destruction doctrine no longer worked with China and Russia? Are we talking years or decades?

Secretary ROOD. It is a hard question to answer because the circumstances in which it may arise and the contexts in which we face these kinds of challenges would be the case. There is the technical capabilities, the destructive capabilities that are on a certain vector in Russia and China, but there are also the specific consequences and circumstances around an application.

So the short answer to your question, Congressman, would be, it is very hard to predict, but I don't recommend that we take the risk of remaining static and not being flexible and adjusting our approach and our capabilities as we go forward.

Mr. BROOKS. I understand it is hard to give an estimate, but do you have an opinion or a judgment that you can share with us as to when we need to start feeling insecure about the mutually assured destruction doctrine that has kept a nuclear war at bay for roughly six decades?

General HYTEN. So, Congressman, I don't think we have to worry about that for at least a decade.

Mr. BROOKS. Okay.

General HYTEN. I think the capabilities that we have that we will operate for the next decade will allow us to maintain the basis of nuclear deterrence.

But what we have to guard against is we have to guard against a miscalculation on behalf of our potential adversaries, particularly Russia and China. We can't allow them to think that they can employ a nuclear weapon, whether on the battlefield or strategically, and the United States will not be able to respond.

That is why the mix of capabilities, the diverse capabilities that we talk about in a Nuclear Posture Review, help us to increase that deterrent posture. It raises the bar for the Russians or the Chinese to take that step across the line and do something foolish that would cause a significant issue.

But there is nothing they can do outside of a massive attack against our country that we would not have the ability to respond to. And, oh, by the way, our submarines, they do not know where they are, and they have the ability to decimate their country if we go down that path.

So I am confident in that. But we have to modernize these capabilities, because 10, 12 years from now all the capabilities that I operate today will be reaching end of life. We can't allow that to happen without modernizing and replacing them.

Mr. BROOKS. I agree with learning from history, and certainly with what happened on December 7, 1941, in Pearl Harbor indicates that it is best to make sure that the other side knows that we are always capable of doing more than they want to deal with.

So it seems that our missile interceptor system, to a very large degree, is designed to deal with rogue lesser nations like North Korea and perhaps Iran. How many interceptors do you think we need in the near future, how many more? And also, do you think we need an East Coast interceptor system as Iran appears to become more and more capable?

And I am almost out of time, so I don't know if the chairman will allow an answer or not.

Mr. ROGERS. Briefly.

Secretary ROOD. The precise number of interceptors is one of the things we are evaluating as part of the Missile Defense Review. In our budget request you see a request for an increase up to 64, that we will initially—those are our present plans for ground-based interceptors. We are looking at a mix of capabilities to improve that, to include the potential for a third site, but we haven't yet made a formal decision as to whether to pursue that and where.

Mr. BROOKS. Thank you. Thank you, Mr. Chairman.

Mr. ROGERS. What we are going to do, we have been called for votes. I am going to recognize Mr. Norcross from New Jersey and then Mr. Hunter from California. Then we are going to recess while we go vote and we will come back to the closed session after that.

So the gentleman from New Jersey is recognized for 5 minutes.

Mr. NORCROSS. I don't need 5 minutes. I will wait for closed session, Mr. Chairman.

Mr. ROGERS. We are moving along.

The gentleman from California is recognized.

Mr. HUNTER. Thank you, Mr. Chairman. I am going to go ahead and ask.

General Hyten, multiple combatant commanders, including yourself, have expressed a need for boost-phase intercept capability, yet there is not a single line in MDA's budget to holistically address. It could be the same answer you gave to Mr. Lamborn. You do mention nascent energy, directed energy efforts. Super risky. Super new.

From your perspective, I guess this is down to brass tacks here, what is the fastest way to get boost-phase intercept in the hands of the warfighter?

General HYTEN. So, Congressman, boost-phase intercept is an area of significant interest to STRATCOM. We have stated clearly our requirement to move as far left as we can, including left of launch, to get after the missile defense threat. If you noticed, the review that is currently underway has changed from a ballistic missile defense review to an overall defense review to talk about all of those things. I expect those things will be discussed in the Missile Defense Review as well.

But, to me, it is really not a technical question. To me, it is a policy question. And the challenge that we have is that if it is a kinetic weapon and we want to attack in the boost phase, that means we have to employ a kinetic weapon inside an adversary's territory. That is a significant decision for the policymakers in order to make.

I am a big fan of continuing to pursue directed energy, as Congressman Lamborn talked about a while ago, because I think the great thing about directed energy is that, if we can employ that in that kind of, directed energy actually continues out into space, it does not come down in an adversary's territory.

The technology is advancing rapidly in that area right now. But I will also point out that we have been working that for multiple decades now. And I had a boss once that told me: Just remember, you know directed energy has always been 5 years away. So we have to be careful not to put too much, too many eggs in one basket.

Mr. HUNTER. But you only mentioned directed energy. In MDA's budget it only talks about directed energy, nothing else.

General HYTEN. We will talk about, we can talk about details in the classified session. It would be much more effective to talk about the details in the classified session.

Mr. HUNTER. Okay. Thank you very much. I yield back, Mr. Chairman.

Mr. ROGERS. I hate that we get interrupted for votes. We have quality witnesses like you and we have a lot of questions. But they didn't ask us when we get called for votes. So we are going to have to recess. And your time is valuable.

So we are going to meet in closed session when we return. We will be gone for about 20 minutes.

So with that, we are now in recess.

[Whereupon, at 4:07 p.m., the subcommittee proceeded in closed session.]

A P P E N D I X

MARCH 7, 2018

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 7, 2018

Opening Statement of Hon. Mike Rogers,
Chairman, Subcommittee on Strategic Forces
Hearing on
U.S. Strategic Forces Posture and the Fiscal Year 2019 Budget Request
Wednesday March 7, 2018 at 3:30 pm Rayburn 2118

The subcommittee will come to order.

We're here today to discuss the Posture of U.S. Strategic Forces and the FY19 Budget Request.

I'll start by introducing our witnesses – we have appearing before us:

General John Hyten, Commander, U.S. Strategic Command.

And, the Honorable John Rood, Under Secretary of Defense for Policy.

Thank you both for testifying today and for your continued service to our nation.

Today's hearing is the first in a series this subcommittee will hold to examine the Fiscal Year 2019 President's Budget Request and what it means for Strategic Forces programs and policies.

And, there is plenty to talk about.

Just this past month, the Administration released its Nuclear Posture Review, which reaffirmed the comprehensive nuclear modernization program initiated by President Obama and suggested a few modest tweaks to policies and programs.

Most notably, the NPR recommends pursuing two supplemental capabilities to the existing triad modernization plan:

They are:

(1) modification of an existing submarine launched ballistic missile warhead to provide a lower-yield option; and

(2) redeployment of a sea-launched cruise-missile capability, similar to the nuclear Tomahawk that was retired in 2010.

Although much of the attention has focused on these areas, one of the most important aspects in my mind is the level of continuity between the Obama and Trump NPRs, which the media seems to disregard.

The other point I'll make here about the NPR, and this applies equally when we talk about changes in space and missile defense, is that the nuclear security environment has deteriorated dramatically in recent years.

There's no better example that I can think of than this quote from the 2010 Nuclear Posture Review: "Russia is not an enemy, and is increasingly a partner."

Well, if you heard President Putin's speech last week and his boasting of four new and horrific nuclear weapons Russia is developing and fielding—and you still think Russia is "increasingly a partner"—then I have a bridge to sell you. Great power competition must be acknowledged.

We must apply a critical eye to our space and missile defense missions, just as we've reassessed our nuclear mission.

Unfortunately, we don't yet have the Missile Defense Review – but I am hoping it will be released shortly. And I expect its findings will support the themes of the National Defense Strategy and Nuclear Posture Review.

While missile defense has received a recent significant boost to its funding with the FY18 Budget Amendment and the FY19 request there is still a lot more that must be done. Particularly in space sensing and directed energy capabilities for missile defense where I believe we need to be more aggressive – and to borrow General Hyten's phrase – go faster. North Korea and Iran show no signs of slowing their pace, and we can't either.

On space, last year's NDAA mandated a number of organizational changes and provided enhanced authorities to the Air Force as we transition to acknowledging that space is a warfighting domain.

These were the first steps down a long path in the right direction. Much remains to be done here to ensure we're postured to both successfully deter a conflict in space, and if need be, prevail over any adversary if a conflict extends into space.

I have tremendous faith in the men and women of our space cadre, I want to make sure we're not hamstringing them by failing to provide the right tools for them to succeed.

I've heard the Air Force talk about a number of promising ideas – such as disaggregating our space capabilities among many smaller satellites instead of a few larger ones, but what I've seen so far in the FY19 budget isn't convincing me we're heading in that direction fast enough.

Lastly, I'd like to acknowledge the special contributions of one of the audience members today to the mission of USSTRATCOM. Mrs. Laura Hyten has gone out of her way to consistently demonstrate her commitment to helping military families and has provided the foundational support to her husband as he leads the men and women of USSTRATCOM. I'd like to acknowledge the sacrifice she makes to our nation, and thank her for making perhaps the best choice she's ever made in marrying a man from Alabama. Roll Tide!

With that, I'll turn it over to my friend and colleague from Tennessee for any comments he'd like to make.

HASC-SF Hearing on the President's Fiscal Year 2019 Budget Request for Strategic Forces: Nuclear, Space and Missile Defense

Mr. John Rood

Under Secretary of Defense for Policy

March 7, 2018

Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Committee. Thank you for the opportunity to testify on the President's Fiscal Year 2019 Budget Request for Strategic Forces.

Security Environment and Strategic Priorities

Today, the United States faces an increasingly complex global security environment, in which the central challenge to our prosperity and security is the reemergence of long-term strategic competition by revisionist powers in China and Russia.

While they pose separate challenges with unique attributes, both China and Russia seek to reshape the world order and change territorial borders. Consequently, they pose increasing security threats to us, our allies and partners.

Long-term competition with China and Russia requires increased U.S and allied military investment because of the magnitude of the threats they pose today, and the potential that these threats will increase in the future. We also must simultaneously strengthen our efforts to deter and counter the clear and present dangers posed by rogue regimes such as North Korea and Iran.

The U.S. military remains the strongest in the world. However, our advantages are eroding as potential adversaries modernize and build-up their conventional and nuclear forces. They now field a broad arsenal of advanced missiles, including variants that can reach the American homeland. For example, only last week Russian President Putin claimed publicly that Russia now possesses unprecedented, new types of nuclear forces with which to target the United States and allies.

While this picture is unsettling and clearly not what we desire, as Secretary of Defense Mattis has pointed out, "We must look reality in the eye and see the world as it is, not as we wish it to be."

The administration has heeded this admonition in recent strategic reviews – the *National Security Strategy*, the *National Defense Strategy*, and the *Nuclear Posture Review*. They reflect a

consistent and pragmatic assessment of the threats and uncertainties we face regarding the future security environment.

Our task at the Defense Department is to ensure that U.S. military advantages endure and, in combination with other elements of national power, we are fully able to meet the increasing challenges to our national security. Weakness invites challenges and provocation, but as both George Washington and Thomas Jefferson observed, American strength deters war and promotes peace. It also assures allies and attracts new partners.

Strengthening our alliances and attracting new partners is a critical element of retaining our advantages. As the National Defense Strategy points out, "Mutually beneficial alliances and partnerships are crucial to our strategy, providing a durable, asymmetric advantage that no competitor or rival can match. This approach has served the United States well, in peace and war."

Nuclear Policy and Posture

The 2018 *Nuclear Posture Review* (NPR) reflects DoD's strategic priority to maintain a safe, secure, survivable and effective nuclear deterrent.

The logic of the NPR was best articulated by Secretary Mattis: "This review rests on a bedrock truth: nuclear weapons have and will continue to play a critical role in deterring nuclear attack and in preventing large-scale conventional warfare between nuclear-armed states for the foreseeable future. U.S. nuclear weapons not only defend our allies against conventional and nuclear threats, they also help them avoid the need to develop their own nuclear arsenals. This, in turn, furthers global security."

Effective deterrence is critical to our security, and in a complex and dynamic security environment there is no "one size fits all" deterrence strategy. The requirements for effective U.S. deterrence can vary greatly given the unique perceptions, goals, interests, strengths, strategies, and vulnerabilities of different potential adversaries. The deterrence strategy effective against one potential adversary may not deter another. Consequently, the 2018 NPR calls for the United States to tailor deterrence as necessary across a spectrum of adversaries, threats, and contexts. Tailoring our deterrence strategy requires a diverse set of nuclear capabilities to counter a spectrum of threats, and the flexibility needed to adjust our deterrent to new threats as they emerge over time.

The 2018 NPR confirms the findings of all previous NPRs that the diverse capabilities of the nuclear triad provide the flexibility and resilience needed for deterrence. Unfortunately, each leg of the triad is now operating far beyond its originally-planned service life. Consequently, we must not delay the recapitalization of the triad initiated by the previous Administration.

We are off to a good start. The FY2019 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 FY19 budget request for nuclear forces is $24 billion, which includes $11 billion for nuclear force sustainment and operations, $7 billion for recapitalization programs (including LRSO, B-21, GBSD, and the Columbia Class SSBN), and $6 billion for Nuclear Command, Control and Communications (including MILSATCOM).

In addition, the President's budget request includes two supplemental capabilities designed to enhance deterrence against emerging challenges in the near- and mid-term. The Department requests funds to modify a small number of existing SLBM warheads to provide a low-yield ballistic missile option in the near term. We also request funds to initiate an analysis of the performance requirements and costs to pursue a modern nuclear-armed sea-launched cruise missile (SLCM) that could be available in the mid-term.

These proposed supplements would contribute to deterrence by raising the threshold for nuclear use. They would do so by denying potential adversaries confidence that their coercive threats of limited nuclear first use, or their actual first use can provide a useful advantage over us and our allies. These supplements do not, and are not, intended to mimic adversary nuclear capabilities. They can, nevertheless, help address the imbalance in U.S. and Russian non-strategic nuclear forces, and may create incentives for Russia to return to compliance with its nuclear arms control commitments.

The U.S. commitment to nonproliferation and arms control remains strong. The United States remains committed to all of its obligations under the Nuclear Non-Proliferation Treaty, including Article VI. We will continue to use arms control measures like the New Start Treaty, nonproliferation measures, and counter nuclear terrorism measures to advance the security of the United States and our allies and partners.

Missile Defense Policy and Posture

Let me turn now to missile defense. The Department's FY19 budget request supports the President's direction set out in the *National Security Strategy* to deploy a layered missile defense system to protect the American homeland from North Korean and Iranian missile threats. Our missile defense system not only protects the American people, it strengthens the deterrence of war and the assurance of allies.

Today, the Ground-based Midcourse Defense (GMD) system provides this protection for the U.S. homeland. It consists of 44 Ground-Based Interceptors (GBI) deployed in Alaska and California; land-, sea-, and space-based sensors; and a command and control system. We are strengthening this GMD system and investing in technologies to ensure that we can continue to counter rogue state missile threats to our homeland. Doing so is one of our highest priorities.

For this purpose, in September 2017, DoD requested the reprogramming of FY17 funding of over $400 million to counter the North Korean missile threat. Congress approved this request. A portion of these funds support important homeland defense activities, including initiating work on the procurement of 20 additional GBIs in Alaska as early as 2023, which will bring the total to 64 fielded interceptors. The reprogramming also funded a service life extension to the COBRA DANE radar in Alaska and software upgrades to the Sea-Based X-band (SBX) radar. In November 2017, the President submitted an amendment to his FY18 budget request for $4.0 billion for homeland and regional missile defense which includes construction of a new missile field at Fort Greely, Alaska and additional procurement funding for the 20 new GBIs.

The FY19 budget request includes $9.9 billion for the Missile Defense Agency and $3 billion for air and missile defense activities in the military Services. The budget includes funding for: a more capable GBI with the Redesigned Kill Vehicle; the deployment of new missile tracking and discrimination sensors in Alaska, Hawaii, and the Pacific region; and a new Space-based Kill Assessment capability.

We are also moving forward to bolster homeland defenses against air and cruise missile threats. In 2018, we will complete the first part of a two-phase effort to provide effective surveillance against these missile threats to the National Capital Region. Doing so will enhance our ability to detect, track, and investigate suspicious aircraft, as well as cruise missiles, and when necessary, cue our missile defense systems. We are on track to begin the second phase of this effort in FY19. We are also looking into technologies and concepts that could be used to provide scalable and deployable options for the rest of North America.

The Department's FY 2019 budget request also continues deployment of regional missile defenses tailored to meet missile threats to U.S. forces abroad, allies and partners in Europe, the Middle East, and the Asia-Pacific region. The budget seeks to enhance our regional missile defense capacity through additional Patriot, THAAD, and SM-3 Block IB and IIA interceptors. Because systems such as Patriot, THAAD, and our Aegis BMD capable ships can be surged when and where required, they make it possible to deploy layered missile defense capabilities that are responsive to regional missile threats as they arise.

We are also encouraging our allies and partners to acquire missile defense capabilities, and to strengthen missile defense cooperation and interoperability. We are pleased with the progress at NATO to build greater missile defense capabilities and important collaborative efforts with allies in Asia and Middle East.

Potential adversaries are modernizing and expanding their missile capabilities. We must ensure that our missile defense investment strategy and priorities enable us to meet the most dangerous missile threats today, while also enabling us to counter future missile threats as they expand. Areas for work on advanced technology include improved discrimination in our missile defense system sensor architecture, lasers to intercept offensive missiles during their most vulnerable boost phase of flight, and the multi-object kill vehicle.

Space Policy and Posture

U.S. space systems are essential to our prosperity, security and way of life, and DoD's space capabilities are critical for effective deterrence, defense, and U.S. force projection capabilities. Consequently, DoD must be prepared to address threats to our national security assets located in space.

Due to the critical importance of these assets, the *National Security Strategy* states that "any harmful interference with or an attack upon critical components of our space architecture that directly affects this vital U.S. interest will be met with a deliberate response at a time, place, manner, and domain of our choosing." The President's FY19 Budget Request includes $12.5 billion to take steps to establish a more resilient, defendable space architecture. This is an increase of $1.1 billion from the FY18 budget.

The United States does not fight alone. Bringing together our allies and partners to share capabilities and information strengthens deterrence and defense, and increases the effectiveness of our combined space force. Cost sharing agreements, hosting U.S. national security payloads on foreign systems, and data sharing arrangements to bolster shared space situational awareness are just a few of the opportunities that our allies and partners provide.

Conclusion

Mr. Chairman, let me conclude by stating that in an increasingly complex and threatening security environment, DoD must sustain the capabilities needed to deter and defend against attacks on our homeland, U.S. forces deployed abroad, allies and partners. We must make the investments needed to address the on-going erosion of our advantages and remain the preeminent military power in the world. Along with our allies and partners, we must ensure that we have the capabilities needed, now and in the future, to protect our people and the freedoms we cherish, and are able to engage potential adversaries diplomatically from a position of strength.

To do so, I urge you to support the important capabilities funded in the President's FY19 budget request.

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

John C. Rood
Under Secretary of Defense for Policy

John C. Rood serves as the Under Secretary of Defense for Policy. He assumed this position on January 9, 2018. In this role he serves as the principal advisor to the Secretary of Defense for defense policy and leads the formulation and coordination of national security policy within the Department of Defense. Mr. Rood oversees integration of defense polices and plans to achieve desired objectives. He is responsible for efforts to build partnerships and defense cooperation with U.S. friends and allies.

Mr. Rood brings more than three decades of public and private sector experience to this position, including over 20 years of service in the U.S. Government at the Department of State, Department of Defense, National Security Council, Central Intelligence Agency, and as a Staff Member in the U.S. Senate. At the Department of State, he served as Acting Under Secretary of State for Arms Control and International Security, and as Assistant Secretary of State for International Security and Nonproliferation. Mr. Rood served in the Department of Defense as the Deputy Assistant Secretary of Defense for Forces Policy. He served twice at the National Security Council where he was a Special Assistant to the President and Senior Director for Counterproliferation, as well as the Director of Proliferation Strategy, Counterproliferation, and Homeland Defense. At the Central Intelligence Agency, he served as an analyst following missile programs in foreign countries. In addition, Mr. Rood worked as a Senior Policy Advisor to U.S. Senator Jon Kyl of Arizona.

In the private sector, Mr. Rood was Senior Vice President of Lockheed Martin International where he led efforts to grow the corporation's international business. He also served as Vice President for Corporate Domestic Business Development at Lockheed Martin. Prior to joining Lockheed Martin, he was a Vice President at the Raytheon Company.

Mr. Rood holds a Bachelor of Science in Economics from Arizona State University.

HOUSE COMMITTEE ON ARMED SERVICES

STATEMENT OF

JOHN E. HYTEN

COMMANDER

UNITED STATES STRATEGIC COMMAND

BEFORE THE

HOUSE ARMED SERVICES

STRATEGIC FORCES SUBCOMMITTEE

7 MARCH 2018

HOUSE ARMED SERVICES COMMITTEE

INTRODUCTION

USSTRATCOM is a global warfighting command, setting the conditions across the globe as the ultimate guarantor of national and allied security. Our forces and capabilities underpin and enable all other Joint Force operations.

USSTRATCOM is globally dispersed from the depths of the ocean, on land, in the air, across cyber, and into space, with a matching breadth of mission areas. The men and women of this command are responsible for Strategic Deterrence, Nuclear Operations, Space Operations, Joint Electromagnetic Spectrum Operations, Global Strike, Missile Defense, Analysis and Targeting, and Cyberspace Operations (until USCYBERCOM is elevated). Nearly 184,000 Soldiers, Sailors, Airmen, Marines, and Civilians support the USSTRATCOM mission, providing an umbrella of security for the United States and its allies every day. These critical capabilities are an integral part of our combat operations and enable warfighters across all domains to preserve the peace and when called upon, dominate in conflict and win.

This past year, USSTRATCOM began restructuring in alignment with our warfighting mission. We now have an air component and will soon have a maritime component. Due to the command's unique responsibilities, we are also leading doctrine with our new Joint Force Space Component Commander.

Our new Command and Control Facility is moving toward completion and will support the long-term viability and credibility of our strategic deterrent force. From this new facility, we will conduct strategic planning, warfighting operations, aid the President's nuclear response decision-making process, provide global situational awareness to the National Command Authorities and combatant commands, and, when necessary, deliver a decisive response in all domains.

The focus of this command remains to deter strategic attack on the United States and its allies. USSTRATCOM stands ready to respond to threats anywhere, anytime across the globe. We acknowledge that we cannot do this alone and must continually work towards enhancing our alliances and partnerships, in all areas.

The command's priorities remain:

- Above all else, we will provide Strategic Deterrence;
- If deterrence fails, we are prepared to deliver a Decisive Response;
- We will do this with a resilient, equipped, and trained Combat-Ready Force.

GLOBAL SECURITY ENVIRONMENT

The strategic landscape of today is increasingly uncertain, complex, and volatile. Long-term, inter-state strategic competition between nation states is reemerging, rogue regimes are taking actions that threaten regional and global stability, and violent extremist organizations are bent on destroying peace across the globe. Nevertheless, we remain committed to strategic stability with China and Russia.

China continues to challenge in the Indo-Pacific region, and our allies and partners look to the U.S. to provide balance. China's excessive maritime claims and aggressive conduct in both the South China Sea and East China Sea undermine international law and global maritime standards. Moreover, China's continued long-term military modernization of both conventional and strategic forces has implications in the Indo-Pacific region and beyond. They are aggressively modernizing their mobile nuclear forces and re-engineering their long-range ballistic missiles to carry multiple nuclear warheads. China is swiftly developing and testing a hypersonic-glide vehicle capability, a technology used to defeat ballistic missile defenses. China's pursuit of conventional global strike capabilities, offensive counterspace capabilities, and exploitation of computer networks also raises questions about its global aspirations. These developments – coupled with a lack of transparency on nuclear issues such as force disposition and size – impact regional and strategic stability.

Russia continues to pose challenges that require consistent and deliberate focus. Russia's support to forces in eastern Ukraine (which it continues to fight alongside with), occupation and purported annexation of Crimea, operations in the Middle East, and efforts to present itself as the mediator for concerns in Middle East and Asia-Pacific regions reinforce its goal of being seen as a military and diplomatic global power. Russia continues to tout advances in cyber and counterspace capabilities along with improvements in its strategic nuclear and general purpose forces. In June 2017, as part of an effort to destabilize Ukraine, the Russian military launched the most destructive and costly cyber-attack in history. The effects of this attack spread globally and included devastating damage to U.S. businesses. On March 1, President Putin announced Russia's development of six new strategic nuclear weapons systems including an intercontinental-range nuclear-powered cruise missile, an intercontinental-range underwater drone, and a maneuverable hypersonic glide vehicle. President Putin's statements are not surprising and only reinforce Russia's commitment to develop weapons designed to intimidate and coerce the U.S. and its allies. Finally, Russia's violation of the Intermediate-range Nuclear Forces (INF) Treaty with the development of the SSC-8 ground launched cruise missile remains a significant issue as delivery of the treaty-violating system continues.

North Korea remains a dangerous and unpredictable actor in the Pacific region, continuing to develop the capability to threaten the U.S. and allies with Pyongyang's evolving ballistic missile and nuclear weapons program. Kim Jong Un continues to defy international norms and resolutions through

provocative actions including their sixth nuclear test, three tests claimed to be of Intercontinental Ballistic Missiles (ICBM), and the WannaCry cyber-attack. North Korea is progressing in development of Submarine Launched Ballistic Missiles (SLBM) and Intermediate Range Ballistic Missiles. These developments highlight its commitment to diversify its missile forces and nuclear delivery options, while strengthening missile force survivability. North Korea continues efforts to expand its stockpile of weapons-grade fissile material and demonstrated its capability and willingness to conduct destructive cyber-attacks against the U.S. and its allies.

Iran continues to develop ballistic, space, and cyberspace capabilities – and we remain focused on preventing the development of the new threats in the region. While the International Atomic Energy Agency continues to verify Iran is meeting its nuclear-related Joint Comprehensive Plan of Action obligations, we must remain vigilant to any Iranian intentions that indicate it will abrogate its commitments and pursue nuclear weapons.

Ungoverned or ineffectively governed regions remain incubators for those who seek to attack the world's peaceful societies. Transregional Terrorist Organizations (TTOs) recruit and operate freely across political, social, and cyberspace boundaries. The effect of weapons of mass destruction (WMD) in the hands of TTOs could be catastrophic, which highlights the importance of our national nonproliferation and counter-WMD efforts.

THE PROBLEM

Today, our deterrent force is safe, secure, ready, and reliable, but the pace of change in the strategic environment is rapid and demands adapting how we operate in order to stay ahead of evolving threats. Failure to meet the pace of change will result in decreasing U.S. global influence, eroding cohesion among allies and partners, and reduced access to markets contributing to a decline in our prosperity and standard of living. The actions we take today assure continued American primacy in the future.

Our budget, requirement, acquisition, and testing processes are too slow. We need integrated processes that are faster and tolerate a greater acceptance of risk. The velocity of change required to resolve our operational challenges is far higher than we have attained to date. Our culture must embrace competition, seek higher performance levels, and generate urgency in achieving innovative outcomes. We must remember that our military superiority is not a birthright, but rather actively sustained by each generation.

STRATEGIC DETERRENCE

We must look at deterrence through a new lens. We are no longer defined by the bi-polar world of two superpowers that simplified our approach to deterrence. The U.S. is challenged by multiple adversaries with an expanding range of capabilities available to them. With each potential adversary comes a different set of perceptions and internal dynamics. Deterrence is more complex and a 'one size fits all' approach no longer applies. Operations countering one adversary have potential second and third order consequences when interpreted by other potential adversaries or our allies. This multipolar and all-domain environment requires collaboration among combatant commands, other DoD elements, allies, and partners ensuring individual efforts do not adversely affect the globally integrated approaches to each problem set. To maintain military superiority in this multipolar world, we must out-think, out-maneuver, out-partner, and out-innovate our adversaries.

The bedrock of our deterrence is our safe, secure, ready, and reliable nuclear Triad. The surest way to prevent war is to be prepared for it. While the current Triad continues to provide the backbone to our national security, we will eventually consume the last remaining margin from our investments made during the Cold War. Our modernization programs including the B-21 bomber; COLUMBIA-Class Ballistic Missile Submarine (SSBN); the Ground-Based Strategic Deterrent (GBSD); Long Range Standoff (LRSO) cruise missile; Nuclear Command, Control, and Communications (NC3); and life-extended nuclear warheads will provide – without a doubt – the nuclear deterrent capabilities our nation needs, now and well into the future.

Today, deterrence is more than just our nuclear capabilities. Deterrence requires integrated planning for all capabilities, across all domains. This enables the synchronized operation and decisive response to adversary aggression anytime, anywhere. We must make this concept operational for all domain warfighting throughout the DoD. We must normalize space and cyberspace as warfighting domains. There is no war in space, just as there is no war in cyberspace. There is only war, and war can extend into any domain. To fight wars in these domains we must develop the appropriate rules of engagement that allow for rapid response and delegate authority to the appropriate level to operate more quickly.

THE NUCLEAR POSTURE REVIEW (NPR)

The 2018 NPR guides nuclear modernization efforts and establishes U.S. deterrence policy, strategy, and posture over the coming years. This document responds to the threats of today, the burgeoning challenges of tomorrow, and underscores nuclear deterrence as a foundational element of U.S. national strength. The NPR clearly ties to USSTRATCOM's priorities.

The guidance in the NPR is based on the strategic environment of today. As Secretary Mattis states in the document's preface, "We must look reality in the eye and see the world as it is, not as we wish it to be." Our previous efforts to deemphasize the role of nuclear weapons and reduce the size and variety of capabilities within our nuclear force did not have the reciprocal effect on other nuclear-armed states. China and Russia continue to place increased importance on nuclear weapons in their strategy and doctrine as well as expand the number and diversity of their nuclear weapons and weapon systems. We remain committed to strengthening nonproliferation and nuclear security, and we stand ready to reengage on future arms control agreements. However, a commitment to arms control and other reductions cannot be unilateral in the face of ever-increasing threats. This would harm the readiness of our nuclear deterrent, destabilize relations with potential adversaries, and reduce the confidence our allies place in our extended deterrence guarantees.

While our nuclear posture is successful in deterring our adversaries today, we require a mix of yields and improved platforms to credibly deter the threats of the near future. The NPR directs near-term fielding of a low-yield SLBM capability, and in the longer term, pursuit of a modern nuclear-armed sea-launched cruise missile (SLCM). These capabilities are necessary to enhance the flexibility and responsiveness of our nuclear forces to ensure potential adversaries understand they cannot achieve their objectives through force and there is no benefit in the use of nuclear weapons - in any scenario. Russia's increased "non-strategic nuclear weapons" and evolving doctrine of first-use in a limited conflict, give evidence of their perceived advantage at lower levels of conflict. North Korea's burgeoning nuclear capabilities demonstrate the belief that nuclear weapons provide escalation options against the U.S. and our allies in the Pacific. We must counter these dangerous perceptions with supplemental capabilities to our previously planned modernization programs. These enhanced deterrence capabilities ensure adversaries clearly understand U.S. resolve and do not miscalculate the consequences of nuclear use, raising the nuclear threshold and reducing the likelihood of nuclear weapon employment.

The NPR clearly states the role of nuclear weapons in hedging against an uncertain future. While hedging is not new, this explicit statement communicates importance of nuclear weapons in ensuring we are ready and confident to address future threats. As we have witnessed over the past decade, the security environment can change quickly. Technology is constantly evolving, and countries are seeking to use these technologies to advance their own capabilities and diminish ours. This requires an agile, ready force that is flexible enough to meet the ever-changing strategic environment, and men and women who are dedicated to the mission and postured to win.

NUCLEAR WEAPONS AND SUPPORTING INFRASTRUCTURE

To remain a credible nuclear state, the U.S. must have modern facilities and a highly skilled workforce able to maintain a credible nuclear deterrent. Across the nuclear enterprise, many of the specialized capabilities required to complete stockpile work have either atrophied or become obsolete. As a result, the U.S is not capable of producing and/or manufacturing many of the materials and unique components in the quantities needed to sustain the stockpile over the long term.

Re-establishing the capability to produce plutonium pits at a production rate sufficient to support planned weapon sustainment activities must be a national priority. Specifically, USSTRATCOM requires no less than 80 War Reserve plutonium pits delivered to the stockpile per year by 2030 to support future deterrent requirements. Delays in developing a viable plutonium pit production capability will eventually affect our ability to meet the nation's deterrence mission requirements.

In addition to plutonium manufacturing, we require critical infrastructure investments in uranium processing, tritium processing, and lithium component production. Any shortcomings in these infrastructure projects represent a real risk to maintain force readiness and our capability to respond to either a technical issue with our stockpile or adversary advancements in their capabilities.

Modern facilities are of little value without a highly skilled workforce to conduct the necessary surveillance, sustainment, and modernization activities necessary to maintain our deterrent. National Nuclear Security Administration's (NNSA) Administrator and each of our national security laboratory directors have expressed concerns with recruiting, developing, and retaining the workforce essential to sustain our stockpile. The U.S. must have a workforce and industrial base capable of designing, engineering, and producing materials and components necessary to sustain the number of warheads and develop a flexible stockpile to hedge against future risks.

Since the Nuclear Weapons Council (NWC) approved the Long Term Stockpile Sustainment Strategy, we have made solid progress in life extending our aged weapon stockpile. The Navy's W76-1 ballistic missile warhead Life Extension Program (LEP) is over 90% complete and on track to finish in 2019. The B61-12 gravity bomb program is on schedule, on budget, and exceeding operational expectations. This weapon supports extended deterrence commitments to NATO and allows the U.S. to retire legacy gravity weapons that are approaching the end of their service lives. The Air Force and NNSA are progressing with work on the LRSO cruise missile and the associated W80-4 warhead design work to deliver that weapon system on schedule.

Our next significant weapon LEP decision pertains to future ballistic missile warhead modernization. We must determine the appropriate approach for the replacement of the Air Force's W78 ICBM warhead. The NWC's Strategic Plan is examining the feasibility of producing a warhead with

interoperable features for both Air Force and Navy ballistic missile systems. The W78 replacement study will determine the appropriate approach for developing and deploying this much needed capability.

NUCLEAR WEAPONS SECURITY

Protection of nuclear weapons, installations, and personnel is the utmost priority. We continue to work closely with the Navy and Air Force to assess nuclear security requirements and adjust our force posture, training, and equipment to maintain the high standards this mission demands. While we continue to upgrade our security capabilities, there are areas where additional investments are required to ensure the absolute denial of unauthorized access to nuclear weapons.

We need to replace the Vietnam-era UH-1N helicopters that provide security across our vast ICBM complex. I strongly support any effort that delivers a replacement helicopter with the necessary speed, armament, and carrying capacity to meet our security requirements as soon as possible.

Additionally, we need to address the escalating costs of an aging security infrastructure. Our nuclear security program relies heavily on manpower that requires appropriate investments to ensure our existing nuclear security programs are capable of protecting this Nation's most vital assets against a wide-range of technological and human threats.

The continued proliferation of sophisticated small Unmanned Aircraft Systems (sUAS) is concerning. The availability, ease of use, and capabilities of these sUAS vehicles represents a growing threat to our deterrence operations. We rapidly implemented counter-sUAS systems into our security architecture, and continue to refine our tactics, techniques, and procedures to address the developing threat. Pacing this sUAS threat will require vigilance and dedicated investment as these capabilities continue to evolve.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS (NC3)

Our nation's nuclear deterrent continues to be as effective as the command, control, and communications capabilities that enable it to function; therefore, we require an assured, reliable, and resilient NC3 system across the full spectrum of conflict. Maintaining a credible nuclear deterrent requires sustainment, modernization, and recapitalization of key systems and capabilities throughout the NC3 architecture that ensures effective command and control of the Nation's nuclear forces throughout today's complex multi-domain, multi-threat security environment. These capabilities must provide assured communications capabilities to the President and nuclear forces throughout all phases of hostilities and under all conditions.

USSTRATCOM requires a robust NC3 capability operating throughout the space, aerial, and terrestrial domains to both effectively execute strategic deterrence operations and provide support for the

President as an essential component of the National Leadership Command Capability. As an example of this, USSTRATCOM is working with the White House, national laboratories, and the private sector to develop decision support capabilities, setting the conditions for timely and informed senior leader decision-making under any circumstance.

In the space domain, we are transitioning from the aging Military Strategic and Tactical Relay (MILSTAR) satellite communications system to the Advanced Extremely High Frequency (AEHF) satellite communications systems. The AEHF satellite constellation system, coupled with requisite ground node and airborne platform Family of Advanced Beyond Line-of-Sight terminals (FAB-T) extends enhanced capabilities to enable collaboration between the President and senior advisors under any circumstances and improves connectivity with the nuclear forces.

Within the aerial domain, we are continuing to replace aging communications systems on the E-6B Airborne Command Post (ABNCP) and Take Charge and Move Out (TACAMO) aircraft as well as the E-4B National Airborne Operations Center (NAOC) to provide assured and worldwide connectivity to the nuclear forces. In conjunction with communications update efforts, the Air Force is pursuing a course of action to recapitalize the E-4B platform, which is approaching its end of service life. The Air Force continues efforts to field a very low frequency (VLF) capability for the B-2 bomber fleet and will leverage that capability to modernize the B-52's legacy VLF systems. These advancements, combined with our extremely high frequency communications, provide bombers with beyond line-of-sight connectivity throughout the spectrum of conflict.

INTERCONTINENTAL BALLISTIC MISSILES

The U.S. relies on ICBMs as a critical component of a credible and effective nuclear deterrent force. ICBMs promote strategic stability as no adversary can defeat our highly responsive and widely dispersed ICBM force with a limited, surprise attack. Additionally, our ICBM force provides the bulk of our day-to-day nuclear alert force with precision and professionalism. Serving over 60 years, our Minuteman force will retire in the mid-2030s, well beyond any deployed strategic missile in the world. We must execute a comprehensive ICBM modernization program to keep the force effective in this rapidly evolving strategic environment.

In August 2017, the Air Force achieved a significant milestone when it awarded the GBSD Technology Maturation and Risk Reduction contract. The future GBSD weapon system will employ modern, proven technology to meet the varied threats of today and incorporate modular architectures able to adjust quickly to advancing adversary technologies. GBSD will employ enhanced security features to counter evolving threats while reducing resource demands. Likewise, GBSD's maintenance processes

employ advanced diagnostic tools allowing us to predict and resolve technical issues before affecting operations.

Finally, replacing 1960 and 1970s technology with state-of-the-art systems will increase effectiveness and provide better platform performance with greater resilience against improving adversary defenses. GBSD will deliver a modern missile system, supported by a fully updated infrastructure, all delivered at lower cost.

BOMBERS AND AIR DELIVERED NUCLEAR WEAPONS

Bombers represent the most visible and flexible leg of the U.S. nuclear Triad. Their presence unambiguously demonstrate U.S. commitment and resolve to deter potential adversaries and assure our allies and global security partners. The bomber's operational flexibility provides the President a number of options in response to a crisis. The combination of stealth and long range denies adversaries the ability to use geography to protect high value assets.

The B-52 will remain in our arsenal for several more decades and is receiving a communications upgrade to ensure command and control connectivity. Additionally, the B-52 requires a radar system upgrade to enhance weapons delivery, improve targeting capability, and improve weather detection and avoidance. Replacing the B-52's engines provides increased combat range, reduced air refueling demand, longer on-station time, and a significantly reduced maintenance footprint.

As our nation's only penetrating long-range strike aircraft, we are enhancing the B-2's survivability to retain the platform's stealth attributes against modern air defenses. Beyond the B-2, the B-21 will ensure we maintain an effective penetrating bomber capable of striking any target around the world even as potential adversaries deploy increasingly sophisticated air defenses.

While legacy gravity bombs and the Air Launched Cruise Missile (ALCM) meet current military requirements, declining sustainability and survivability challenges require a focus on replacement systems. The B61-12 gravity bomb and LRSO cruise missile programs must deliver on schedule to avoid any strategic or extended deterrence capability gaps.

Legacy bombers and their associated weapons are beyond or quickly approaching their intended service life, requiring focused attention and resources to maintain combat readiness. To ensure our air delivered deterrent remains effective, ongoing sustainment and planned modernization activities must remain on schedule.

SEA-BASED STRATEGIC DETERRENT

Every day, a sizable portion of our OHIO-class SSBN fleet is silently patrolling at sea, un-locatable to our adversaries, and ready to respond when called upon. These submarines, and their highly

capable Trident II (D5) SLBM, constitute the most survivable leg of our strategic deterrent force. As such, they send a very clear message to any adversary that they cannot hope to gain any benefit from a strategic attack against the U.S. or its allies.

The robust design of the OHIO-class SSBN, along with a comprehensive maintenance program, allowed its operational life to extend from 30 to 42 years. However, with no engineering margin to extend them further, the OHIO-class SSBNs will retire starting in 2027. To avoid a capability gap in our strategic deterrent, the COLUMBIA-class SSBN must deliver on time for its first strategic deterrent patrol in 2031. Building the COLUMBIA-class SSBN requires highly technical and unique skillsets spanning multiple manufacturing and trade disciplines. As production draws near, we must support our industrial partners' expansion of both infrastructure and training programs to minimize the risk of potential delays.

To avoid two concurrent strategic weapon programs, the Navy extended the life of the D5 SLBM, enabling it to serve as the initial ballistic missile for the COLUMBIA-class SSBN. The D5 SLBM was fielded over 25 years ago, and we must begin a follow-on SLBM program for the COLUMBIA-class SSBN to remain effective to its projected end of life in the 2080s. USSTRATCOM and the Navy will work together in developing the strategic requirements for this follow-on SLBM that continues the unparalleled success of the D5 SLBM.

SPACE

Space is a warfighting domain just like the air, ground, maritime, and cyberspace domains. The DoD, with the National Reconnaissance Office (NRO), is implementing the Space Warfighting Construct. This construct supports the National Space Policy and focuses on the forces, operations, and systems needed to prevail in a conflict that extends into space. As an enterprise, we must normalize how we think of space, operate in it, and describe it to each other. It is unique for many reasons, but the concepts that govern other military operations such as intelligence, maneuver, fires, protection, logistics, and command and control apply just the same.

In April 2017, we re-named the Joint Interagency Combined Space Operations Center (JICSpOC) to the National Space Defense Center (NSDC). The NSDC is a partnership organization strongly supported by both the DoD and Intelligence Community (IC) that develops and improves our ability to rapidly detect, warn, characterize, attribute and defend against threats to our nation's vital space systems. The NSDC directly supports space defense unity of effort and expands information sharing in space defense operations among the DoD, NRO, and other interagency partners. Recently, the NSDC transitioned to 24/7 operations, marking a significant step for the growing interagency team focused on protecting and defending the nation's critical space assets.

In 2016, Air Force Space Command (AFSPC) and NRO developed the joint Space Enterprise Vision (SEV) to advance their shared interest in designing, acquiring, and operating more agile and resilient space capabilities in response to emerging threats. A key goal of the SEV is to leverage synergies in AFSPC/NRO acquisition activities, where feasible, as the two organizations pursue architectures and operational approaches in support of their respective missions.

Multi-national space operations initiatives are paramount in the safety and security of the space domain. As we continue our combined space operations initiative with Australia, Canada, New Zealand, and the United Kingdom, we are expanding the initiative with the addition of France and Germany. I have directed the Joint Force Space Component Commander to transition our Joint Space Operations Center (JSpOC) to a Combined Space Operations Center (CSpOC) by the end of 2018. The CSpOC model envisions a centralized hub for operational planning and tasking with distributed execution through contributing partners.

Exercises and wargames continue to refine how we coordinate today and determine how we will work together in the future. This year, Japan is participating in the Schriever Wargame, joining France, Germany, and our Five Eye partners. GLOBAL SENTINEL, our operational experiment for space situational awareness, increased its international participation in 2017 and now includes Australia, Canada, the United Kingdom, France, Spain, Germany, Italy, Japan, and the Republic of Korea.

Future satellite communications (SATCOM) systems are 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 pathfinder opportunities to leverage space operations.

We must continue to build a robust SATCOM network that includes our allies and partners and leverages commercial SATCOM industries to integrate, synchronize, and share global SATCOM resources. Through multilateral SATCOM agreements Canada, Denmark, Luxembourg, the Netherlands, and New Zealand provided funding for Wideband Global SATCOM-9 (WGS-9) that launched in March 2017. These international partners receive a proportional share of the bandwidth provided by the WGS constellation based on their financial contribution.

The department continues to close the gap in synchronizing terminals and ground infrastructure to match available satellite capability, a time-critical and essential element in operating freely in all other domains. Our protected wideband communications are essential for allowing the warfighter to communicate in contested environments. Our narrowband legacy constellation is approaching the end of its life cycle in a matter of years, and any additional loss of satellites will reduce our narrowband SATCOM capabilities. The narrowband follow-on Mobile User Objective System (MUOS) using

Wideband Code Division Multiple Access (WCDMA) has experienced delays due to program development, waveform challenges, and Service terminal fielding schedules. The fielding of new AEHF Extended Data Rate (XDR) capabilities is improving over time, but delayed XDR terminal programs are hampering the transitions from MILSTAR to AEHF.

USSTRATCOM, in conjunction with AFSPC, Fleet Cyber Command, and U.S. Army Space and Missile Defense Command / Army Forces Strategic Command (SMDC/ARSTRAT), is standing up 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 the Joint Force Space Component Commander's ability to mitigate and fight through SATCOM degradation and continue to support the warfighter in a potentially contested domain. Interim SIOE operations will be located at headquarters SMDC/ARSTRAT and is scheduled for completion in March 2018. SIOE is currently operating in a limited fashion, and we are working on providing additional joint manning positions to bring it to initial operational capability.

In accordance with the direction of the 2018 National Defense Authorization Act, USSTRATCOM will deliver a space warfighting concept of operations (CONOPs) no later than June 11, 2018. This CONOPs will guide the Service's space capabilities development and acquisition programs.

JOINT ELECTROMAGNETIC SPECTRUM OPERATIONS

Achieving superiority throughout the electromagnetic spectrum is an essential prerequisite for achieving superiority across all other military domains. USSTRATCOM developed an electromagnetic spectrum operational employment guide for standardized and synchronized electromagnetic battle management, and we are working with the other combatant commands on the implementation of this guide in joint electromagnetic spectrum operations planning. In coordination with the Joint Staff, we are initiating development of a Joint Electromagnetic Spectrum Operations doctrine publication, working to re-align electronic warfare universal joint tasks, advocating for advancing joint training in realistic congested and contested electromagnetic spectrum environments, and identifying electromagnetic battle management requirements.

This comes at a time when our ability to maneuver freely within the electromagnetic spectrum is at risk. Many countries have adapted their militaries for spectrum warfare, developing specific electronic/spectrum warfare units and electronic attack capabilities to counter our spectrum dependent systems. The electromagnetic spectrum is not a utility to be managed, it is a maneuver space, the same as other warfighting domains. If we fail to change the way we resource, train, and operate within the spectrum, we risk allowing an adversary to control key terrain in the future.

MISSILE DEFENSE

Missile proliferation and lethality continues to increase as more countries acquire greater numbers of missiles and are increasing their technical sophistication specifically to defeat U.S. missile defense systems. In the past year, we continue to see missile tests from North Korea and Iran as well as other nations that are introducing increasingly sophisticated missiles – all of which cause us and our allies deep concern. Their efforts to advance missile technologies threaten global stability and seek to degrade our ability to project power. In response, we must continue our efforts to advance missile defense forces and capabilities to assure allies of our commitment for a common defense and to deter further aggressions from these regional and transregional actors.

In addition to the NPR, the Department is conducting a 2018 Missile Defense Review (MDR). The MDR is broader in scope than the 2010 Ballistic Missile Defense Review, addressing more than the ballistic missile threat, specifically hypersonic vehicles and cruise missiles.

We cannot be successful in this endeavor by investing solely in active missile defense capabilities – we must strengthen and integrate all pillars of missile defense including the capability to defeat adversary missiles before they launch. We are exploring efficiencies gained by fusing non-kinetic, cyber, electromagnetic, and kinetic capabilities to deny, defend, and defeat adversary threats. Furthermore, we are requesting additional efforts invested in the Department's ability to find, fix, track, target, engage, and assess (F2T2EA) threats and the adoption of corresponding policy and organizational constructs. We continue to gain synergy through integrated missile defense planning, force management, and operations support ensuring global coordination of regional missile defense execution – thereby, matching the best interceptor with the best sensor.

We must strengthen our collaboration with our allies and explore further integration of our collective capabilities toward an effective mutual defense. We are investing in collaboration with our allies across multiple venues, including the USSTRATCOM-hosted NIMBLE TITAN wargame. We conduct this biennial wargame with key allies and in partnership with the Department of State and other combatant commands. We continually explore and experiment with potential collaboration and integration approaches with our allies to inform development of options for operations, policies, and investments.

As an essential element of the U.S. commitment to strengthen strategic and regional deterrence against states of concern, we continue to deploy missile defense capabilities and strengthen our missile defense postures. We operationally deployed the Aegis Ashore Missile Defense Complex in Romania completing the European Phased Adaptive Approach Phase II to defend against threats from the Middle East, particularly Iran. We deployed additional Ground Based Interceptors (GBIs) to meet the objective of

44 GBIs by the end of 2017. We are continuing investments toward our warfighting missile defense priorities, which are essential. Priority missile defense upgrades and capability advancements include:

- Sensor and discrimination capabilities. Continued development of the Long Range Discrimination Radar (LRDR) in Alaska. A new homeland discrimination radar to support the defense of Hawaii. A new Medium Range Discrimination Radar to provide additional precision and tracking. Upgraded and expanded land, sea, and space based detection and tracking sensors.
- Kill vehicles. Increase the reliability and lethality of our interceptors including the development of the Redesigned Kill Vehicles (RKV) for the GBI, completion of testing and deployment of the SM-3 Block IIA capability, and enhancements to the GBI, most notably the Multi-Object Kill Vehicle (MOKV).
- GBIs. Increase the GBI inventory to 64 and complete Missile Field-4 at Fort Greely, Alaska to provide silos for 20 additional fielded interceptors as early as December 2023.
- Capability and capacity. Increase the robustness of regional missile defense capability and capacity including deployment of the Aegis Ballistic Missile Defense and the Terminal High-Altitude Area Defense (THAAD) capabilities and implementation of recommendations from the Department's Joint Regional Integrated Air and Missile Defense Capability Mix (JRICM) study.

Finally, we depend on flight-testing, which is critical in assessing and validating the performance of the operational system in actual flight environments. The high cost of flight-testing often limits the number of flight test opportunities. The Missile Defense Agency strives to maximize opportunities for learning through flight test success or failure. The body of data collected in flight-testing is robust, and we discover unexpected findings with each test. Flight test failures are unplanned, but when failures happen – learning occurs. The root cause of failure is determined, corrective actions are implemented, and the overall capability of the system improves.

CONVENTIONAL PROMPT STRIKE (CPS) / HYPERSONIC STRIKE

Adversary anti-access / area denial strategies are challenging traditional U.S. approaches to power projection. Advancements in adversary integrated air defense systems and offensive missiles inhibit our ability to maneuver within the battlespace. Additionally, our strategic competitors are investing significant resources in hypersonic weapon research and development with the goal of deploying hypersonic strike weapons in the next few years. The Department is pursuing hypersonic capabilities

along several lines of effort, but we need to prioritize and accelerate development if we are to field our own capability in the near term.

New long-range, survivable, lethal, and time-sensitive strike capabilities, such as a hypersonic CPS weapon, will allow the U.S. to achieve its military objectives in these environments. This new weapon class prevents adversaries from exploiting time and distance and provides additional response options below the nuclear threshold. The Navy's successful CPS flight test last October demonstrated the technical maturity required to field an effective hypersonic strike solution within the near future. As our competitors continue to move fast in this area, we must retake the initiative and commit the necessary resources to develop and field hypersonic conventional weapons.

CONCLUSION

USSTRATCOM truly is a global warfighting command, and the strength of this command is its people. The Soldiers, Sailors, Airmen, Marines, and Civilians in this enterprise have the most important mission in the entire Department. We expect them to perform to the highest standard, yet mission success often looks as if nothing happened. The hard work and dedication of the nearly 184,000 men and women supporting the USSTRATCOM mission ensures our nation's strategic capabilities remain safe, secure, reliable, and ready. Sustained Congressional support will ensure we remain ready, agile, and effective in deterring strategic attack, assuring our allies and partners today and into the future.

Peace is our profession…

General John E. Hyten

Gen. John E. Hyten is Commander of U.S. Strategic Command (USSTRATCOM), one of nine 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 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 AFB, 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, Colo. 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
2011 Senior Managers in Government Course, Harvard University, Cambridge, Mass

ASSIGNMENTS

1. November 1981 - December 1985, Configuration Management Officer and Chief, Configuration Management Division, Automated Systems Program Office, Gunter AFB, Ala.
2. December 1985 - July 1989, Chief, Software Development Branch; and Chief, Engineering and Acquisition Division, Space Defense Programs Office, Los Angeles AFB, Calif.
3. 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.
4. July 1990 - August 1991, Deputy for Engineering, Strategic Defense Initiatives Program Office, Los Angeles AFB, Calif.
5. August 1991 - May 1992, Executive Speechwriter and Systems Analyst, Assistant Secretary of the Air Force (Acquisition), the Pentagon, Washington, D.C.
6. May 1992 - July 1993, Program Element Monitor, Advanced Technology Programs, Assistant Secretary of the Air Force (Acquisition), the Pentagon, Washington, D.C.
7. July 1993 - June 1994, Student, Air Command and Staff College, Maxwell AFB, Ala.
8. July 1994 - June 1996, Mission Director, Space Operations Officer, and Chief, Command Center Training, U.S. Space Command, Cheyenne Mountain Air Force Station, Colo.
9. August 1996 - August 1998, Commander, 6th Space Operations Squadron, Offutt AFB, Neb.
10. August 1998 - June 1999, National Defense Fellow, University of Illinois, Champaign
11. 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, Washington, D.C.
12. 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,

Washington, D.C.
13. June 2003 - July 2004, Director, Commander's Action Group, Headquarters Air Force Space Command, Peterson AFB, Colo.
14. July 2004 - April 2005, Commander, 595th Space Group, Schriever AFB, Colo.
15. 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)
16. May 2007- September 2009, Director of Requirements, Headquarters Air Force Space Command, Peterson AFB, Colo.
17. 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, Washington, D.C.
18. February 2010 - August 2010, Director, Space Acquisition, Office of the Under Secretary of the Air Force, the Pentagon, Washington, D.C.
19. September 2010 - May 2012, Director, Space Programs, Office of the Assistant Secretary of the Air Force for Acquisition, Washington, D.C.
20. May 2012 - Aug 2014, Vice Commander, Air Force Space Command, Peterson AFB, Colo.
21. Aug 2014 – Oct 2016, Commander, Air Force Space Command, Peterson AFB, Colo.
22. 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, CO., 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, Washington, D.C., 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 Service 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 November 2016)

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 7, 2018

QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. STRATCOM has been providing foundational space situational awareness data to non-USG entities in accordance with 10USC2274 since 2012. At a time when legitimate DOD space situational awareness requirements will be increasing, does it still make sense for STRATCOM to be providing this data to the public or is this better suited to a different federal agency?

Secretary ROOD. Pursuant to Title 10, U.S. Code, Section 2274, the Department of Defense (DOD), through U.S. Strategic Command, provides a variety of space situational awareness (SSA) data and services to non-U.S. Government entities worldwide. These SSA data and services promote space flight safety, protection of the space environment, and contribute to the U.S. vital interest in unfettered access to and freedom to operate in space. DOD is the only U.S. Government entity currently capable of providing these SSA support services. However, providing such SSA support services to non-U.S. Government entities is not inherently a military mission. A different Federal department or agency could perform this function if provided appropriate resources and authorities.

Mr. ROGERS. Under Secretary Rood, Secretary Mattis is now the third consecutive Secretary of Defense that has identified nuclear deterrence as the highest-priority mission of the Department of Defense. Do you believe 6 or 7 percent of our defense budget is an appropriate level of spending for the nation's #1 priority defense mission? Do you believe this is affordable?

Secretary ROOD. Yes. Maintaining an effective nuclear deterrent is much less expensive than fighting a war that we fail to deter. We can afford this level of investment against one of the few existential threats that we face.

Mr. ROGERS. Under Secretary Rood, do you believe DOD should develop a detailed 30-year cost estimate for modernizing, sustaining, and operating our nuclear force? Do you believe this type of report would be accurate and useful, or just inject misleading information into the debate? Do you believe the current 10-year plan and estimate DOD already provides each year to Congress is sufficient?

Secretary ROOD. The Department of Defense (DOD) has multiple tools with which to assess the cost of modernizing, sustaining, and operating U.S. nuclear forces. DOD's primary tool is the current 10-year plan and estimate that we provide to Congress annually. We believe this is the best mechanism for formally reporting costs to Congress because it is a more reliable estimate given large degrees of uncertainty, such as inflation, material costs, and labor rates inherent in any longer term estimate of the nuclear enterprise. A 30-year estimate would introduce a high degree of uncertainty that would risk providing Congress with imprecise and potentially misleading data.

Mr. ROGERS. Under Secretary Rood, how do the supplemental capabilities proposed by the NPR—a low-yield submarine-launched weapon and a sea-launched cruise missile—help shore up deterrence and assurance in this new era of great power competition?

Secretary ROOD. The low-yield ballistic missile (LYBM) and sea-launched cruise missile (SLCM) are necessary to address our concerns that potential adversaries may believe they can effectively threaten or employ limited nuclear strikes. These supplemental capabilities, along with the existing elements of our Triad, provide a diverse set of nuclear capabilities that will provide flexibility to tailor the U.S. approach to deterring different potential adversaries.

Mr. ROGERS. Under Secretary Rood, do the supplemental capabilities proposed by the NPR lower the threshold for nuclear use? Are they about nuclear warfighting or about ensuring conflict is avoided altogether? Do you believe the addition of these capabilities to the U.S. nuclear arsenal increase or decrease the likelihood of a nuclear war?

Secretary ROOD. By taking steps to help convince adversaries that even limited use of nuclear weapons will be more costly than they can tolerate, we in fact raise that threshold for nuclear weapons use, thereby decreasing the likelihood of nuclear war. The supplemental capabilities proposed by the NPR are intended to ensure conflict is avoided altogether and decrease the likelihood of nuclear war.

Mr. ROGERS. Under Secretary Rood, do we need a low-yield SLBM when we already have a low-yield nuclear gravity bomb? Are these capabilities redundant? How do adversary air defenses factor into the recommendation for a low-yield SLBM?

Secretary ROOD. The low-yield submarine-launched ballistic missile (SLBM) is highly survivable when deployed in ballistic missile submarines at sea, while our gravity bombs are more vulnerable in fixed storage and operating locations. SLBMs are highly accurate and, given their speed and trajectory, are better able to penetrate modern defenses that could challenge air-delivered weapons. The low-yield SLBM does not reduce the need for air-delivered gravity bombs and dual-capable aircraft, which can be forward deployed, contribute to allied burden sharing, provide visible assurance to both allies and partners, and serve as a tangible demonstration of U.S. extended deterrence guarantees.

Mr. ROGERS. Under Secretary Rood, what is your assessment of the impacts from Russia's violation of the INF Treaty? What impact may this violation have on our military, defense posture, and that of our allies? How does the NPR and the administration's December 2016 Russia strategy propose to address this violation? How long should the U.S. continue to remain in the INF Treaty if Russia continues to violate it?

Secretary ROOD. Russia's violation of the Intermediate-range Nuclear Forces (INF) Treaty is a concrete threat to U.S. forces and to allies and partners in Europe and Asia. Therefore, the United States is pursuing an integrated strategy supported by diplomatic and economic measures as well as Treaty-compliant research and development actions intended to persuade Russia to return to full and verifiable compliance. This includes a review of U.S. options for conventional, ground-launched, intermediate-range missile systems which would enable the United States to defend ourselves and our allies and partners should Russia not return to compliance.

Mr. ROGERS. Under Secretary Rood, should we be considering extending the New START Treaty while Russia is violating the INF Treaty, violating the Open Skies Treaty, violating the Treaty on Conventional Forces in Europe, and failing to comply with the Biological Weapons Convention, the Chemical Weapons Convention, and many other arms control commitments? Do you believe we should pursue further nuclear arms control measures with Russia while Russia is in violation of so many existing arms control agreements?

Secretary ROOD. The United States remains willing to engage in a prudent arms control agenda. We are prepared to consider arms control opportunities that return parties to predictability and transparency, and remain receptive to future arms control negotiations if conditions permit and the potential outcome improves the security of the United States and its allies and partners. The United States will continue to implement the New START Treaty fully, which complements the U.S. nuclear deterrence strategy by contributing to a transparent and predictable strategic balance between the United States and Russia. We will consider next steps related to the New START Treaty at the appropriate time, taking into account Russia's compliance with its obligations under the New START Treaty and other arms control agreements.

Mr. ROGERS. Under Secretary Rood, were our allies consulted as the NPR was being considered and drafted? What did they say? How are they reacting to the proposal to continue the Obama administration's program of record and add two supplemental capabilities?

Secretary ROOD. Throughout the 2018 Nuclear Posture Review, we consulted extensively with allies and partners. They were unanimous in the view that the security environment has changed for the worse since 2010; they offered a range of opinions on the environment and the continued need for nuclear deterrence; and they appreciated our efforts to consult with them. Our East Asian allies in particular appreciated the reaffirmation of U.S. extended deterrence commitments. In Europe, reactions were positive, particularly our proposed moves to strengthen deterrence, reaffirm our declaratory policy, and further the goals of the Treaty on Non-Proliferation of Nuclear Weapons. A number of European allies emphasized the importance of balancing deterrence with arms control and non-proliferation initiatives. Reactions to continuation of the U.S. nuclear modernization program were generally positive. No European allies objected to the inclusion of the supplemental capabilities. Many viewed these supplemental capabilities as an appropriate counter-balance to Russian, Chinese and North Korean developments. In briefings and meetings at NATO, Allies recently have reacted positively to the NPR.

Mr. ROGERS. Under Secretary Rood, the NPR recommends the U.S. retain the longstanding ability to forward-deploy dual-capable aircraft, like F–15s and eventually F–35s, around the world—not just in Europe. This includes Asia, correct? Why is the ability to deploy dual-capable aircraft like F–35s to Asia—in support of allies like Japan and South Korea—important? Do our dual-capable aircraft help reassure

our allies in Asia? How have our Asian allies, particularly Japan and South Korea, reacted to the NPR?

Secretary ROOD. The United States will continue to maintain, and enhance as necessary, the capability to forward deploy dual-capable aircraft (DCA) around the world, including in Asia. Because DCA can be forward deployed to any region, they can provide a clear signal to potential adversaries that the United States possesses the forward-deployed capabilities to respond promptly to potential escalation. Their tangible presence also contributes significantly to the assurance of allies and partners. As such, they make the U.S. nuclear deterrent more flexible and enable better tailoring of our strategy to possible regional adversaries.

Both Japan and South Korea have expressed support for the 2018 Nuclear Posture Review (NPR), and appreciation for the close consultations throughout the process.

Mr. ROGERS. Under Secretary Rood, are you satisfied with DOD's relationship with the National Nuclear Security Administration (which supplies and maintains U.S. nuclear warheads)? What works best in this relationship? What would you change? Is the forum for this relationship, the Nuclear Weapons Council, functioning as it should? How often do you speak to your counterparts in NNSA and the Department of Energy?

Secretary ROOD. The Department of Defense works closely with the Department of Energy's National Nuclear Security Administration (NNSA) to ensure that the U.S. nuclear stockpile and its supporting infrastructure provide the warheads our forces need to reliably deter strategic attacks against the United States, and our allies and partners. I look forward to working closely with Secretary Perry and NNSA Administrator, Ms. Gordon-Hagerty, on modernizing and recapitalizing all aspects of the U.S. nuclear deterrent and U.S. nuclear infrastructure to ensure a safe, secure, and effective deterrent that protects the homeland, assures allies and partners and above all, deters adversaries. I speak regularly to my counterparts at NNSA. We use the Nuclear Weapons Council as a key means to ensure the DOD and DOE/NNSA are coordinated in our approaches and this is an effective forum to discuss and resolve issues.

Mr. ROGERS. Under Secretary Rood, the Obama administration had a policy of not pursuing any new U.S. nuclear capabilities and reducing the role of U.S. nuclear weapons in our national security strategy. The 2010 NPR claimed this would show leadership and discourage other nations from pursing their own new nuclear capabilities. Has this policy influenced the behavior of foreign nuclear powers, in particular of Russia? If our potential adversaries are not following our lead here, is it dangerous for us to continue down this road indefinitely if no other nation—except perhaps our closest ally in the U.K.—is doing the same? In your view, how likely is it that the U.S. nuclear deterrent can remain credible to 2050 or beyond if we never modify or improve its nuclear capabilities while other countries continue to advance?

Secretary ROOD. For decades, the United States led the world in efforts to reduce the roles and number of nuclear weapons. Although the United States has reduced its nuclear arsenal by more than eighty-five percent since its Cold War peak, others have not followed our example. Russia, China and North Korea are growing their stockpiles, increasing the prominence of nuclear weapons in their security strategies, and—in some cases—pursuing the development of new nuclear capabilities to threaten peaceful nations. In this environment, it is not possible to delay modernization of U.S. nuclear forces if we are to preserve a credible nuclear deterrent. This is a top priority of the Department of Defense.

Mr. ROGERS. Under Secretary Rood, does the U.S. currently have a "launch-on-warning" or "launch-on-alert" posture in our nuclear forces? Or do we just retain the option to "launch-under-attack?" In what scenario do you envision the U.S. potentially "launching-under-attack?" How does the U.S. verify it is under attack in such a scenario? Are you concerned the U.S. may mistakenly launch a nuclear strike, either in a day-to-day posture or during a crisis? Do you believe we should de-alert our ICBMs or other nuclear forces?

Secretary ROOD. The United States maintains a portion of its nuclear forces on alert day-to-day, and retains the option of launching those forces promptly. This posture maximizes decision time and preserves the range of U.S. response options. Forces on day-to-day alert are subject to multiple layers of control, ensuring clear civilian oversight and, when needed, Presidential decision-making. Over more than half a century, the United States has established a series of measures and protocols to ensure that intercontinental ballistic missiles on land and at sea are safe, secure, and under constant control. Any U.S. decision to employ nuclear weapons would follow a deliberative process.

Mr. ROGERS. Under Secretary Rood, do you support a U.S. policy of no-first-use of nuclear weapons? What do our allies think of the U.S. potentially adopting such a policy? Would such a policy increase the deterrence of adversaries and the assurance of allies?

Secretary ROOD. I do not support a policy of no-first use of nuclear weapons. The United States has never adopted a "no-first-use" policy and, given the contemporary threat environment, such a policy is not justified today. Such a policy would undermine both deterrence of adversaries and assurance of allies and partners.

Mr. ROGERS. Under Secretary Rood, President Putin announced last week that Russia was pursuing and fielding four new nuclear weapons because the U.S. refuses to engage in arms control and is developing missile defenses to thwart Russia's strategic forces. Are these reactions to the 2018 NPR or have they been in development for years/decades? Does the U.S. plan to respond with additional new nuclear weapons of its own, or stick to the triad and dual-capable aircraft modernization program initiated by President Obama plus the two supplemental capabilities proposed by the NPR?

Secretary ROOD. President Putin's announcement, was not a reaction to the 2018 Nuclear Posture Review (NPR). The systems he referenced in his comments were in development for years before the NPR's publication. The NPR affirms the U.S. commitment to recapitalizing and modernizing the nuclear Triad and dual-capable aircraft, and announces the intent to modify existing submarine-launched ballistic missile warheads to provide a low-yield option and to pursue a modern nuclear-armed sea-launched cruise missile. These decisions were not in response to the capabilities announced by President Putin but were made to ensure that the United States maintains a safe, secure and effective nuclear deterrent so we make certain nuclear weapons are never used.

Mr. ROGERS. Under Secretary Rood, what does the NPR recommend regarding our nuclear command, control, and communications (NC3) system? What actions is DOD considering or pursuing? How do you think DOD should be organized for NC3 issues? As NC3 recapitalization takes place, what are you doing to ensure the systems are secure from both cyber-attacks and supply chain insertions?

Secretary ROOD. The 2018 Nuclear Posture Review provides for the Chairman of the Joint Chiefs of Staff to deliver a plan no later than May 1, 2018 to reform NC3 governance to ensure its modernization and effective functioning against current and future environments. In addition to NC3 governance reform, the Administration will pursue a series of initiatives to strengthen NC3, including: 1) strengthening protection against space-based and cyber threats; 2) enhancing integrated tactical warning and attack assessment; 3) improving command post and communication links; 4) advancing decision-support technology; and 5) integrating planning and operations. Airborne NC3 capabilities are key to the overall survivability of the NC3 system; their modernization and sustainment are well-warranted.

Mr. ROGERS. When do you anticipate the Missile Defense Review will be completed?

Secretary ROOD. We will be completing the Missile Defense Review (MDR) in the near future; we need to ensure we get it right. The MDR will respond to the President's guidance to strengthen defenses for the homeland and protect our deployed forces and allies and partners from growing missile threats.

Mr. ROGERS. The Ballistic Missile Defense Review was a requirement in the FY17 NDAA, with a due date of January 31, 2018. We have yet to see this document, understanding that a significant re-write is taking place. When can we realistically expect to see this review, and can you give us a preview of what we will be getting?

Secretary ROOD. We will be completing the Missile Defense Review (MDR) in the near future; we need to ensure we get it right. The MDR will respond to the President's guidance to strengthen defenses for the homeland and protect our deployed forces and allies and partners from growing missile threats. The MDR will be responsive to the broader challenges the Administration has identified in the National Security Strategy and the National Defense Strategy. The review will also address a broader array of threats, including cruise and hypersonic missiles, thus the new title, Missile Defense Review.

Mr. ROGERS. Officials in the Department, and several combatant commanders, have expressed the need to develop next generation technologies in directed energy, space sensing, and boost phase intercept when addressing future ballistic missile threats. I agree with that statement wholeheartedly; however, that is not what is reflected in the PB19 budget submission, which arguably contains "more of the same" interceptor procurements, terrestrial sensors, and spiral development of our current systems. Further, it zeroes programs out like the Missile Defense Tracking System—a needed space-based sensor layer. From an overall strategic standpoint, can you explain this mismatch?

Secretary ROOD. I agree that we must invest in these advanced technologies to cope with increasingly sophisticated missile threats, but we also believe we should invest in near-term improvements to ensure protection against urgent missile threats from North Korea. The President's Budget 2019 does begin to address the issue of advanced technologies. We are funding the development of a demonstration project for space-based discrimination. The Missile Defense Agency is developing and demonstrating directed energy and laser technologies and is testing a range of potential concepts, including both tracking and defensive lasers that could be deployed on a variety of platforms. Simultaneously, we are developing several new radars that will improve our ability to discriminate among and address more complex missile threats, and we are developing an advanced warhead for the Ground-Based Interceptor (GBI)—called Multiple Objective Kill Vehicle (MOKV).

Mr. ROGERS. The NDS highlights a need to continue international collaboration for missile defense. How is OSD Policy adapting that guidance to increase both development cooperation and also making Foreign Military Sales of U. S. systems more enticing, affordable, and "easy" for our allies and partners around the world?

Secretary ROOD. This Administration is integrating FMS with the larger set of security cooperation programs, and identifying process improvements that will enable additional defense exports.

In particular, the Defense Security Cooperation Agency (DSCA) is currently pursuing initiatives under our National Defense Strategy to reform aspects of the FMS process and ensure DSCA is able to deliver effective, enduring, and timely partner capabilities that advance U.S. interests. Some of these may require legislation. Others have to do with changing our internal processes. We have already implemented several changes to the processes such as measures to use forecasted sales to inform both advanced technology transfer decisions and advanced negotiations of priced contract options for an anticipated weapon system, thus enabling a faster timeline to system delivery. We have also identified and implemented ways to leverage multi-country acquisitions with NATO more effectively.

The Office of the Secretary of Defense (OSD) is working cross-functionally as well as with its interagency partners to facilitate international collaboration in missile defense. OSD is supporting allies and partners bilaterally to ensure they are equipped with advanced capabilities to meet threats. This includes DOD efforts, in close coordination with interagency partners and in consultation with U.S. industry, as appropriate, to fulfill Poland's Integrated Air and Missile Defense (IAMD) requirement. This also includes supporting Germany in its development of a Ground Based Air Defense system. The United States continues SM–3 Block IIA guided missile co-development efforts with Japan. To aid Japan's potential acquisition of Aegis Ashore through FMS, the United States highlighted options that will improve delivery timelines. We are also actively pursuing FMS opportunities with the Gulf Cooperation Council (GCC) states, to include a completed sale of THAAD to the UAE and potential acquisition of THAAD by the Kingdom of Saudi Arabia.

Mr. ROGERS. STRATCOM has been providing foundational space situational awareness data to non-USG entities in accordance with 10USC2274 since 2012. At a time when legitimate DOD space situational awareness requirements will be increasing, does it still make sense for STRATCOM to be providing this data to the public or is this better suited to a different Federal agency?

General HYTEN. USSTRATCOM will continue to provide basic space situational awareness data for the public. We must collect that data for our military requirements. As additional sources become available, the United States will have the opportunity to leverage civil, commercial, international and other data to refine this service.

To facilitate enhanced data sharing, and recognizing the need for the DOD to focus on maintaining access to and freedom of action in space, I continue to support designating a civil agency to become the interface for the publicly-releasable portions of the DOD data catalog.

Mr. ROGERS. General Hyten, we've now had three consecutive Secretaries of Defense identify nuclear deterrence as the highest-priority mission of the Department of Defense. Do you agree with this prioritization? Do you believe 6 or 7 percent of our defense budget is an appropriate level of spending for the nation's #1 priority defense mission? Do you believe this is affordable?

General HYTEN. Yes, the commitment to nuclear deterrence is not only affordable it is essential to our National Security—America can afford survival. Maintaining an effective nuclear deterrent is much less expensive than fighting a war that we are unable to deter. We can afford this level of investment against one of the few existential threats that we face.

Mr. ROGERS. General Hyten, do the supplemental capabilities proposed by the NPR lower the threshold for nuclear use? Are they about nuclear warfighting or

about ensuring conflict is avoided altogether? Do you believe the addition of these capabilities to the U.S. nuclear arsenal increase or decrease the likelihood of a nuclear war?

General HYTEN. The NPR concluded deterrence requires a wider range of options than those provided by current forces to ensure the adversary understands the U.S. has the capability and will to respond.

The supplemental capabilities are designed to raise the nuclear threshold by convincing adversaries even the limited use of nuclear weapons will be more costly than they can tolerate.

Mr. ROGERS. General Hyten, in your professional military judgment, do we need a low-yield SLBM when we already have a low-yield nuclear gravity bomb? Are these capabilities redundant? How do adversary air defenses factor into the recommendation for a low-yield SLBM?

General HYTEN. Russian strategy, doctrine, and capabilities call for the limited use of nuclear weapons to coerce NATO, and to defeat NATO conventional forces. They would not have adopted this strategy and doctrine, and would not be expending resources to modernize and expand their non-strategic nuclear forces (which are already approximately ten times larger than NATO's), if they perceived current U.S. and NATO nuclear posture as sufficient to deter such nuclear use.

The 2018 Nuclear Posture Review took a deliberate threat-policy-posture approach to examine the strategic environment. The NPR determined that our deterrent approach must be tailored and flexible to address today's challenges and future uncertainty.

Low yield weapons are a critical piece of our force structure and defense posture but are currently limited to our bomber force—a low yield ballistic missile (LYBM) weapon and sea-launched cruise missile (SLCM) provide unique attributes to enhance existing capabilities:

- LYBM: survivable, prompt, can strike targets that are heavily defended against bombers and air-delivered weapons.
- SLCM: assured response capability, forward-deployable, non-host nation dependent, and provides additional diversity in delivery platforms, range, survivability, and future hedging.

Reintroducing a low-yield option for our sea leg addresses adversary perception of advantage, improves our nuclear deterrent, allows the U.S. to negotiate from a position of strength, and bring an enhanced assurance element to our allies.

Mr. ROGERS. General Hyten, please discuss the requirement for the LRSO cruise missile. Some are saying we don't need the LRSO if we already have a penetrating bomber, such as the B–2 or B–21, armed with nuclear gravity bombs. But the new Nuclear Posture Review states very clearly that we need both LRSO and the B–21 bomber. How do capabilities like LRSO, our bombers, and the nuclear-armed sea-launched cruise missiles contribute to assurance and deterrence in Asia? Do they reassure allies like Japan and South Korea while deterring potential adversaries like China and North Korea? Do you believe LRSO is de-stabilizing? Don't we and the Russians already have dual-capable cruise missiles? Please discuss aging and maintenance in our current air-launched cruise missiles. What happens to these missiles and this capability if LRSO is not fielded on time? What is the risk to a credible nuclear deterrent?

General HYTEN. The B–21 and LRSO are required to ensure the continued effectiveness of the air leg of the Triad. The bombers, delivering both gravity bombs and the LRSO, ensure maximum operational flexibility against a wide variety of targets anywhere in the world and provide a visible and recallable response option intended to deter adversaries and assure allies. The SLCM demonstrates our commitment to allies by providing additional in-theater options to respond to regional instability.

I do not view cruise missiles as destabilizing. Cruise missiles have been fielded on bombers and other platforms (e.g., sea-launched) since the late 1960s. Moreover, Russia has air launched cruise missiles, which implies that they do not view them as destabilizing.

LRSO is a just-in-time replacement for the AGM–86B Air Launched Cruise Missile (ALCM). The ALCM, fielded in the 1980s and decades beyond its planned lifetime, is increasingly difficult to sustain and its ability to survive modern air defenses is eroding.

Mr. ROGERS. General Hyten, is the U.S. in a nuclear arms race with Russia? Please describe Russia's nuclear forces modernization program, comparing and contrasting it to ours. When did Russia embark on its nuclear modernization program and when was ours initiated? When will Russia have largely completed its nuclear modernization program? When will ours largely be completed?

General HYTEN. The systems President Putin mentioned in his recent speech do not change the military balance, nor do they necessitate a change in our deterrence

posture. However, my job is to ensure we can effectively deter and respond to any threats our country faces. The U.S. nuclear modernization program is not increasing the numbers of our strategic nuclear weapons, rather we are replacing systems that are decades past their original design life. Modernization is necessary to preserve our deterrent and hedge against prospective risks.

Russia initiated nuclear modernization in 2009, and is estimated to be 80% complete by 2020 and 100% complete by 2025. The U.S. by comparison has just initiated modernization and will not complete modernization until ~2040.

Mr. ROGERS. General Hyten, the previous administration had a policy of not pursuing any new U.S. nuclear capabilities and reducing the role of U.S. nuclear weapons in our national security strategy. The 2010 NPR claimed this would show leadership and discourage other nations from pursing their own new nuclear capabilities. Has this policy influenced the behavior of foreign nuclear powers, in particular of Russia? If our potential adversaries are not following our lead here, is it dangerous for us to continue down this road indefinitely if no other nation—except perhaps our closest ally in the U.K.—is doing the same? In your view, how likely is it that the U.S. nuclear deterrent can remain credible to 2050 or beyond if we never modify or improve its nuclear capabilities while other countries continue to advance?

General HYTEN. No, Russia, China and North Korea did not follow our lead.

I remain confident in our existing nuclear deterrent force; however our legacy capabilities are serving well beyond their intended design lives and are rapidly approaching end of life. The NPR recognized maintaining a safe, secure and reliable nuclear deterrent is predicated on modernizing the TRIAD, nuclear command, control and communications (NC3), dual capable aircraft (DCA), stockpile and infrastructure.

The President's Budget addresses the Department's nuclear modernization requirements and with continued congressional support, I am confident we will continue to have a credible deterrent for the foreseeable future.

Mr. ROGERS. General Hyten, would putting a single, lower-yield warhead on a D5 submarine-launched missile increase the vulnerability of the submarine beyond the risks it already entails in current war plans? Do current war plans include options for single-missile launches from submarines?

General HYTEN. No, the introduction of a low yield SLBM warhead will not change the operating patterns of SSBNs. Our nuclear forces are postured to decisively respond to a range of contingencies spanning various levels of conflict.

Further, our SSBNs are designed and operated in such a manner as to minimize opportunities for adversaries to attack them, and launching one or more SLBMs will not introduce additional risk to SSBN survivability.

Mr. ROGERS. General Hyten, does the U.S. currently have a "launch-on-warning" or "launch-on-alert" posture in our nuclear forces? Or do we retain the option to "launch-under-attack?" In what scenario do you envision the U.S. potentially "launching-under-attack?" How does the U.S. verify it is under attack in such a scenario? Why did the Obama administration conclude to retain the option to "launch-under-attack?" Are you concerned the U.S. may mistakenly launch a nuclear strike, either in a day-to-day posture or during a crisis? Do you believe we should de-alert our ICBMs or other nuclear forces?

General HYTEN. It remains the policy of the U.S. to retain some ambiguity regarding the precise circumstance that might lead to a U.S. nuclear response. Further, our forces are postured in such a way that no adversary could conceivably be confident they could achieve their objectives in a large scale attack.

The U.S. retains a robust attack warning and assessment capability, and deliberative conferencing procedures to determine the validity and scope of a potential attack, convey information to the President, discuss potential responses and, when directed, execute the President's orders.

The Obama administration in the 2010 NPR and the Trump administration in the 2018 NPR assessed the threat environment and determined the capacity to respond at any time and in any scenario enhances our deterrent. Our forces are postured appropriately to address the threat.

Mr. ROGERS. General Hyten, are you concerned that an adversary may not know whether a single D5 missile launched at it is carrying a single warhead or multiple warheads?

General HYTEN. No, but this is not a new dilemma. An adversary would understand the scale of the attack—regardless of the number of Reentry Vehicles—is limited and does not represent an existential threat.

Mr. ROGERS. General Hyten, is the nuclear declaratory policy in the 2018 NPR in any significant way different from the Obama administration's declaratory policy?

General HYTEN. No, the 2018 NPR does not expand the circumstances in which the U.S. might consider using nuclear weapons.

The 2018 NPR declaratory policy states "the United States would only consider the employment of nuclear weapons in extreme circumstances in defense of the vital interests of the United States, its allies, and partners." The 2010 NPR contained the same language.

The 2018 NPR further clarifies 'extreme circumstances' by providing examples that might elicit U.S. consideration of a nuclear response. Clarification reduces the potential for adversary miscalculation which enhances deterrence.

Mr. ROGERS. General Hyten, do you believe the U.S. deploying a low-yield SLBM warhead is simply mirror-imaging the Russian "escalate-to-deescalate" or "escalate-to-win" strategy? Is this low-yield U.S. weapon about fighting and winning a nuclear war or about deterring a nuclear war in the first place?

General HYTEN. The NPR concluded that U.S. nuclear forces require supplemental capabilities to provide a credible response to adversary limited first use of nuclear weapons in order to deter such use.

The supplemental capabilities are designed to raise the nuclear threshold by convincing adversaries even the limited use of nuclear weapons will be more costly than they can tolerate.

Mr. ROGERS. General Hyten, do you support a U.S. policy of no-first-use of nuclear weapons? Why did the Obama administration ultimately conclude in 2016 to not pursue such a policy?

General HYTEN. No, I do not support a "no-first-use" policy.

The Obama Administration in the 2010 NPR and the Trump Administration in the 2018 NPR concluded elimination of the "first-use" policy would unnecessarily constrain options available to the President, particularly in times of extremis.

First use policy also acts as a deterrent to conventional escalation/coercion, assures allies, and is a key element of our extended deterrence policy.

Mr. ROGERS. General Hyten, do you support efforts to go faster on major nuclear modernization programs? What could be done to go faster on the GBSD and LRSO programs?

General HYTEN. Yes, I strongly support service efforts to accelerate modernization. Legacy weapon systems are well past their planned service life and have eroding margin.

The Air Force is executing GBSD and LRSO on schedule and the best way to sustain this momentum is to: 1) pass budgets on-time; 2) keep program requirements stable from Milestone-B through deployment; and 3) pursue mature, low-risk technologies capable of adapting to future changes. I also support initiatives to streamline acquisition and test, and minimize burdensome oversight.

Mr. ROGERS. General Hyten, what types of "non-strategic" nuclear weapons does Russia have? How many non-strategic nuclear weapons does Russia have? How many types and how many numbers of non-strategic nuclear weapons does the U.S. have? What steps does the NPR recommend regarding non-strategic nuclear weapons?

General HYTEN. [The information is classified and retained in the committee files.]

Mr. ROGERS. General Hyten, please describe the military requirements that are driving U.S. nuclear modernization plans. What do we see other countries doing and how does that impact our requirements? How does aging or vulnerabilities in our own U.S. nuclear forces impact requirements and modernization plans?

General HYTEN. Nuclear weapons have and will continue to play a critical role in deterring nuclear attack and preventing large-scale conventional warfare between nuclear armed states for the foreseeable future. The military requirements driving U.S. nuclear modernization plans are based on a pragmatic assessment of the threats we face and the uncertainties regarding the future global security environment.

U.S. nuclear forces must be survivable, forward deployable, responsive, visible, penetrating and accurate.

Our legacy nuclear weapon systems are operating well past their designed service life and have eroding margin, while adversaries are modernizing their nuclear forces, strategic systems, and conventional capabilities to achieve their national security objectives in today's complex and demanding global security environment.

Mr. ROGERS. General Hyten, what is the military requirement for a low-yield submarine-launched ballistic missile (SLBM) warhead and a sea-launched cruise missile (SLCM)? Isn't it correct that the low-yield SLBM warhead is a simple modification to an existing weapon? Not a new weapon? And isn't it correct that the U.S. deployed SLCMs for several decades—before giving them up in 2010. Wouldn't this be updating and redeploying a capability we used to have?

General HYTEN. The military requirement for a low-yield SLBM warhead and a SLCM is in direct response to the threat. Russian strategy, doctrine, and capabili-

ties call for the limited use of nuclear weapons to coerce NATO, and to defeat NATO conventional forces through the wider use of nuclear weapons if their coercive use fails.

Modification of the SLBM warhead and reintroduction of the SLCM will strengthen deterrence by convincing adversaries the U.S. has credible and effective options at any level of escalation, and they cannot escalate their way out of a failing conflict through the use of nuclear weapons.

The nuclear armed sea-launched cruise missile is a capability the U.S. deployed for a number of years and is not a new capability. The Department is in the process of determining the technical approach to pursue this capability.

Mr. ROGERS. General Hyten, why does the NPR recommend retaining the B83 nuclear gravity bomb? Does STRATCOM have targets that only the B83 nuclear gravity bomb can hold at risk?

General HYTEN. [The information is classified and retained in the committee files.]

Mr. ROGERS. General Hyten, what does the NPR recommend regarding our nuclear command, control, and communications (NC3) system? What actions is DOD considering or pursuing? How do you think DOD should be organized for NC3 issues? As NC3 recapitalization takes place, what are you doing to ensure the systems are secure from both cyber attacks and supply chain insertions?

General HYTEN. *What does the NPR recommend regarding our NC3 system?*

NC3 system must assure integrity of transmitted information and be resilient and survivable to overcome effects of adversary nuclear attack. NC3 must be increasingly flexible to tailor deterrence strategies across a range of potential adversaries and threats, and enable adjustments over time. We must sustain and replace nuclear capabilities, modernize NC3, and strengthen the integration of nuclear and non-nuclear military planning.

What actions is DOD considering or pursuing?

Space assets that are agile and resilient against 21st century threats; enhanced threat warning systems that keep pace with modern threats. Communications links between command centers and Triad forces that are assured, resilient, and reliable at all levels of conflict. Protection of NC3 components against current and future cyber threats. Advanced Decision Support for senior leadership to enable more informed response to any event in most timely manner. Planning systems capable of providing integrated options across the full spectrum of effects (e.g. conventional/nuclear).

How do you think DOD should be organized for NC3 issues?

As noted in the 2018 NPR, DOD authority and responsibility for governance of the NC3 system is broadly diffused and must be integrated. To get at this problem, the Chairman was tasked through the NPR to provide Secretary Mattis a recommended plan to reform NC3 governance. I'll have to defer further comment until after the SECDEF makes his determination.

As NC3 recapitalization takes place, what are you doing to ensure the systems are secure from both cyberattacks and supply chain insertions?

While efforts are ongoing at the Joint Staff level to modify existing practices of contract enforcement and/or oversight, I have directed Cyber Protection Teams to continue to conduct Defensive Cyber Operations on our most critical NC3 systems. Additionally, USSTRATCOM is working with the interagency and partnering with OUSD(I), to: 1) incorporate rigorous supply chain security measures throughout the lifecycle of our most sensitive systems and 2) guide Intelligence Community and law enforcement efforts to quickly detect and respond to supply chain threats.

Mr. ROGERS. Officials in the Department, and several combatant commanders, have expressed the need to develop next generation technologies in directed energy, space sensing, and boost phase intercept when addressing future ballistic missile threats. I agree with that statement wholeheartedly; however, that is not what is reflected in the PB19 budget submission, which arguably contains "more of the same" interceptor procurements, terrestrial sensors, and spiral development of our current systems. Further, it zeroes programs out like the Missile Defense Tracking System—a needed space-based sensor layer. From an overall strategic standpoint, can you explain this mismatch?

General HYTEN. I agree there is a need to develop next generation technologies in directed energy, space sensing, and boost phase intercept. It is important to note, the PB funds both existing capabilities as a near-term hedge and begins development of next generation upgrades and capability advancements to strengthen our missile defense posture.

I concur MTS is a needed space-based sensor capability and although the PB does not fund MDA to pursue this program directly, the PB does fund the AF, in close

cooperation with MDA, to develop a missile warning sensor demo to inform the future next generation MTS/OPIR programs.

QUESTIONS SUBMITTED BY MR. SMITH

Mr. SMITH. What was the reason to reverse the decision to retire the B83 bomb, and instead keep it in the U.S. arsenal? Is there a change in military requirements that requires keeping these nuclear weapons?

Secretary ROOD. The 2018 Nuclear Posture Review reiterates the prior Administration's commitment to retain the B83–1 in the stockpile until there is sufficient confidence in the B61–12 gravity bomb. Given the changed threat environment, deterrence requirements to hold a variety of protected targets at risk, and the unique capabilities of the B83–1 bomb to fulfill those requirements, the Administration decided to postpone B83–1 retirement until a suitable replacement is validated.

Mr. SMITH. Why are additional low-yield capabilities on sea-based platforms (low-yield D5 on SSBNs and a new sea-launched cruise missile) needed, when the United States already has low-yield options on its air-launched platforms, with the B61 bomb and the air-launched nuclear cruise missile (both of which are being modernized)?

Secretary ROOD. These supplements to the planned nuclear force replacement program are prudent options for enhancing the flexibility and diversity of U.S. nuclear capabilities to help address emerging deterrence requirements in the near term and beyond. Together, they will: provide a more diverse set of capabilities enhancing our ability to tailor deterrence and assurance; expand the range of credible U.S. options for responding to nuclear or non-nuclear strategic attack; and enhance deterrence by signaling to potential adversaries that their concepts of coercive, limited nuclear escalation offer no exploitable advantage.

Mr. SMITH. Has the United States ever used low-yield warheads on SSBNs? How might using low-yield nuclear warheads on SSBNs, which seems to have never have been done in the decades of U.S. nuclear deterrence, change when SSBNs might be used in a nuclear conflict? Are they likely to be used early in a conflict to respond to an attempt by Russia to use a low-yield nuclear weapon in a regional, conventional conflict where they might attempt to "escalate-to-deescalate"? And would the purpose be to target Russian territory with a low-yield nuclear weapon?

Secretary ROOD. The United States has never deployed a low-yield submarine-launched ballistic missile (SLBM) warhead. A low-yield warhead was used in the Tomahawk sea-launched cruise missile before the system was retired from the U.S. nuclear inventory. The low-yield capabilities announced in the Nuclear Posture Review (NPR) are intended to enhance the credibility of our deterrent against limited nuclear first-use by an adversary at any stage of a conflict. They will improve our deterrence posture by dispelling any perception among nuclear-armed adversaries, especially Russia, of an exploitable "gap" in our ability to respond to their limited nuclear weapon use strategies (e.g., "escalate to deescalate").

Mr. SMITH. Has the United States ever used low-yield warheads on SSBNs? How might using low-yield nuclear warheads on SSBNs, which seems to have never have been done in the decades of U.S. nuclear deterrence, change when SSBNs might be used in a nuclear conflict? Are they likely to be used early in a conflict to respond to an attempt by Russia to use a low-yield nuclear weapon in a regional, conventional conflict where they might attempt to "escalate-to-deescalate?" And would the purpose be to target Russian territory with a low-yield nuclear weapon?

General HYTEN. Low-yield warheads have never been deployed on a SSBN. Los Angeles-class SSNs employed the TLAM–N with a low yield nuclear option from 1984–2010.

Introduction of a low-yield SLBM warhead is intended to enhance deterrence, raise the nuclear threshold, and prevent escalation of the conflict by providing a flexible, credible capability to tailor U.S. deterrence across a spectrum of adversaries, threats, and contexts.

The targets and weapons used to achieve U.S. objectives are highly dependent upon the context of the conflict.

Mr. SMITH. What was the reason to reverse the decision to retire the B83 bomb, and instead keep it in the U.S. arsenal? Is there a change in military requirements that requires keeping these nuclear weapons?

General HYTEN. [The information is classified and retained in the committee files.]

Mr. SMITH. Why are additional low-yield capabilities on sea-based platforms (low-yield D5 on SSBNs and a new sea-launched cruise missile) needed, when the United States already has low-yield options on its air-launched platforms, with the B61

bomb and the air-launched nuclear cruise missile (both of which are being modernized)?

General HYTEN. Russian strategy, doctrine, and capabilities call for the limited use of nuclear weapons to coerce NATO, and to defeat NATO conventional forces. They would not have adopted this strategy and doctrine, and would not be expending resources to modernize and expand their non-strategic nuclear forces (which are already approximately ten times larger than NATO's), if they perceived current U.S. and NATO nuclear posture as sufficient to deter such nuclear use.

The 2018 Nuclear Posture Review took a deliberate threat-policy-posture approach to examine the strategic environment. The NPR determined that our deterrent approach must be tailored and flexible to address today's challenges and future uncertainty.

Low yield weapons are a critical piece of our force structure and defense posture but are currently limited to our bomber force—a low yield ballistic missile (LYBM) weapon and sea-launched cruise missile (SLCM) provide unique attributes to enhance existing capabilities:

LYBM: survivable, prompt, can strike targets that are heavily defended against bombers and air-delivered weapons.

SLCM: assured response capability, forward-deployable, non-host nation dependent, and provides additional diversity in delivery platforms, range, survivability, and future hedging.

Reintroducing a low-yield option for our sea leg addresses adversary perception of advantage, improves our nuclear deterrent, allows the U.S. to negotiate from a position of strength, and bring an enhanced assurance element to our allies.

QUESTIONS SUBMITTED BY MRS. DAVIS

Mrs. DAVIS. The Russian doctrine of "escalate to deescalate" by using low-yield nuclear weapons is dangerous and reckless. We shouldn't mirror their reckless strategy. So what do we hope to gain by proliferating low-yield weapons? What is the strategic gain of their employment?

General HYTEN. The supplemental low-yield capabilities directed in the NPR—low-yield ballistic missiles (LYBM) and a sea-launched cruise missile (SLCM)—are a measured response to the threat and are intended to deter Russia from acting on their 'escalate to deescalate' strategy. If Russia believes they can successfully use a low-yield nuclear weapon to end a conventional conflict and achieve their objectives, we risk deterrence failure.

The supplemental capabilities are intended to deny potential adversaries any mistaken confidence that limited nuclear employment would provide an advantage restoring the nuclear threshold and increasing the likelihood of conflict is avoided altogether.

Mrs. DAVIS. Cost estimates for nuclear modernization range from $700B to $1.5T. Leveraging diplomatic instruments of power in these times is crucial. Russia has a weak economy; they don't want to spend the money on nuclear modernization if they don't have to. As the only peer nuclear competitor, shouldn't we be looking for ways to shore up current treaties to engage Russia in further bilateral reductions of nuclear weapons?

General HYTEN. While the United States has continued to reduce the number and salience of its nuclear weapons, Russia has expanded and improved its strategic and non-strategic nuclear forces.

The NPR makes clear the United States sees negotiated arms control agreements as a valuable tool to reduce the threats potential adversaries pose to the U.S. and its allies and partners, to increase transparency and predictability and reduce the likelihood of misperception and miscalculation, and to prevent unnecessary competition in nuclear arms.

However, for arms control agreements to serve these purposes effectively we must have a willing partner that complies with the commitments they make in such agreements. This is why a satisfactory resolution of Russia's ongoing violation of the INF Treaty is so important. Without a verifiable return of Russia to compliance with the INF Treaty our ability to use arms control as a means of enhancing U.S. and allied security is profoundly undermined.

QUESTIONS SUBMITTED BY MR. BROOKS

Mr. BROOKS. STRATCOM has stated a need for a Prompt Global Strike weapon, either land- or sea-launched. From our understanding, the Joint Staff has not completed validation of this requirement, despite ongoing development efforts and plans

for the Navy to assume the program in 2019. Do you know why the delay in Joint Staff validation? How is this delay impacting delivery of a capability to fulfill your requirement?

General HYTEN. The Joint Requirements Oversight Council (JROC) revalidated system requirements and capability needs for a Conventional Prompt Strike (CPS) system in 2016. The JROC supported prioritizing deployment of a sea-based prompt strike capability in the near-term and supported further efforts on additional basing modes. The Department took a significant step forward this cycle towards realizing an operational capability by transferring the program to the Navy in 2020 and adding significant resources beginning in FY19. These actions place us on a clear transition path from experimentation to a fielded capability.

Mr. BROOKS. In your opening remarks you stated that the Department is pursuing several lines of effort with hypersonic capabilities, and that we need to prioritize and accelerate development. I assume the several lines of effort you mention are the AT&L (now A&S)/Navy program and the Air Force/DARPA efforts. With the requirement from STRATCOM driving the A&S/Navy development, how do you see the air-launched Air Force efforts competing with what you have stated is the need?

General HYTEN. We continue working closely with other Combatant Commands and Services to ensure warfighter requirements for this capability are addressed. The Air Force and DARPA development of air-launched hypersonic strike capabilities are complimentary to A&S and Navy Conventional Prompt Strike program. The diversity of ranges, survivability, lethality, and delivery options will provide operational commanders flexibility in all phases of conflict.

QUESTIONS SUBMITTED BY MR. LARSEN

Mr. LARSEN. What is your advice to the President on whether to extend New START Treaty? Is the New START Treaty still in U.S. security interests? What would the risk to national security and strategic stability be if the treaty were not extended or updated?

General HYTEN. The New START Treaty has, and continues to be, an essential transparency and confidence building measure in maintaining U.S.-Russia strategic stability.

The verification regime (i.e., on-site inspections, database exchanges, notifications and so on) permits visibility into Russian strategic offensive capabilities which significantly contribute to our understanding of their force structure and pace of modernization.

It also allows us to demonstrate to the Russians that we are compliant, stable and capable. That said, I would advise further dialogue and analysis is prudent on any matters pertaining to extending the Treaty.

Mr. LARSEN. Would the use of a low-yield nuclear weapon from a submarine risk increasing ambiguity? Could an adversary differentiate between a sub-launched missile carrying a single, low-yield nuclear weapon or whether it carried many high-yield nuclear warheads, or whether it carried a conventional hypersonic weapon? Is this an acceptable risk?

General HYTEN. Adversaries cannot determine the yield or number of warheads mated on a launch vehicle. Employment of a low yield SLBM does not change the equation and/or increase ambiguity.

An adversary would understand the scale of the attack—single missile vs multiple launches—and the fact the attack does not represent an existential threat.

Especially during a crisis or conflict, U.S. and Russian decision-makers take the entire threat environment into account—not simply one action. Just as there is no automaticity to respond to limited Russian nuclear employment with a massive response, we should not expect Russia to do so either.

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. Last year's conference report for NDAA FY18 terminated the position and office of the Principal Department of Defense Space Advisor and transferred the duties, responsibilities and personnel to a single official selected by the Deputy Secretary of Defense. How does that impact the Department and how does that affect our readiness in the space warfighting domain?

Secretary ROOD. Pursuant to Section 1601 of the National Defense Authorization Act for Fiscal Year 2018 (NDAA for FY 2018) (Public Law 115–91), the position and the office of the Principal DOD Space Advisor (PDSA) were terminated. The Deputy Secretary of Defense realigned the duties, responsibilities, personnel, and resources of the PDSA directly under the purview of the Deputy Secretary of Defense as an

interim measure as he leads the Department in a comprehensive review of options for space organization and management. The Deputy Secretary carried out this Congressional direction through a January 18, 2018 memorandum, "Guidance for Increasing Lethality and Warfighting Readiness in Space," which "ensures continuity of responsibilities and authorities throughout the DOD space enterprise while this review is conducted." This guidance also reflects the National Defense Strategy's emphasis in its first line of effort to rebuild military readiness as we build a more lethal Joint Force. As a result, DOD is implementing the Congressional direction pursuant to Section 1601 in a manner that strengthens warfighting readiness and lethality in the space domain.

Mr. TURNER. Earlier this year you reorganized your Joint Functional Component Command for Space into a Joint Force Space Component Command and dual-hatted that organization with Air Force Space Command. Can you explain why you did that, what effect you were trying to achieve? What benefit were you trying to derive by dual-hatting the Air Forces' organize, train, and equip major command with the joint responsibility for commanding and operating space units?

General HYTEN. This change was part of a broader command organizational restructure intended to build a coherent and streamlined warfighting construct, consistent with doctrine, to enable more effective command and control of forces and direct lines of authority.

This shift to a dual-hatted joint and service commander elevates and emphasizes the role of space in the joint warfighting environment and improves both unity of command and effort for joint space operations.

Mr. TURNER. You have been a vocal advocate for moving faster in space acquisition. And I agree with that sentiment completely, but where do you think the biggest problem is for space acquisition? How would you redesign the space acquisition process?

General HYTEN. One impediment to moving faster in space acquisition has been our inability to innovate, prototype and field new space capabilities on the timeline of need. We need to stop excessive risk reduction activities where we spend years designing and analyzing exquisite systems rather than pushing to get the right capability on orbit for the warfighter. I see that changing now in both the AF and the DOD. Secretary Wilson, General Goldfein, Dr. Roper, Deputy Secretary Shanahan, Undersecretary Lord, and Undersecretary Griffin are pushing in just this direction.

I also support a process to more easily replace capabilities in a conflict by fielding smaller and cheaper satellites that can quickly integrate with a modular payload bus and inexpensive ground architecture.

To replace capabilities based on warfighter need, we also need to adopt more commercial space procurement practices to push satellite development down to 3 to 5 years and continue to leverage the increasingly affordable launch market.

Eliminating excess bureaucracy is also critical to accelerating acquisition to the speed of relevance, and I believe we have the right leadership in the Department to make strides in this area.

Mr. TURNER. Last year's conference report for NDAA FY18 terminated the position and office of the Principal Department of Defense Space Advisor and transferred the duties, responsibilities and personnel to a single official selected by the Deputy Secretary of Defense. How does that impact the Department and how does that affect our readiness in the space warfighting domain?

General HYTEN. I agree with the NDAA's decision to eliminate the PDSA.

The Deputy Secretary of Defense has not made a decision on where the duties, responsibilities and personnel will transfer. As such, it would be premature for me to comment on effectiveness.

Mr. TURNER. We see an array of new threats that are driving improved missile warning; many of those involve surveillance over the North Pole. How would you characterize polar coverage priorities for Next Gen Missile Warning, and how can our country get more resilient capabilities operational quickly? Should we start with one part of the constellation, the other, or both, based on your assessment of the threats?

General HYTEN. To be clear, our missile warning constellation does provide global coverage (including the North Pole) and is effective against existing ballistic missile threats.

As threats evolve, we must ensure our missile warning capabilities outpace our adversaries through innovation and fielding at the speed of relevance.

I am encouraged with the direction of the President's Budget (PB). The PB accelerates development of a more resilient, global missile warning architecture and begins development of capabilities required to address advanced adversary threats.

Mr. TURNER. Recently we have received the DSD's Space Organization Interim Report which highlights acquisition as a major focus in order for us to move at the speed of relevance with incorporating innovation into the space acquisition process. How important or helpful do you think the final report will be for space acquisition redesign?

General HYTEN. I believe the framework laid out in the interim report moves us in the right direction. I'm optimistic the changes the Deputy Secretary of Defense recommends will be the basis for the modifications necessary to move at the speed of relevance.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. The current plan to modernize and recapitalize the nuclear deterrent and its supporting infrastructure requires a great deal of concurrent work and spending in the 2020s and into the 2030s. In fact, outgoing NNSA Administrator Gen. Klotz stated last month that "We've never done more than one life extension program at a time, since the end of the Cold War. We're now doing essentially four . . . We're pretty much at capacity in terms of people." How is DOD planning for the high concurrency in modernization programs, and now having to add two more capabilities (a low-yield D5 and a new nuclear sea-launched cruise missile)? What risks are there in this plan?

General HYTEN. I agree with Administrator Gordon-Hagerty's assessment in recent testimony to the House Armed Services Strategic Forces Subcommittee. The nuclear weapons enterprise is prepared and has the capabilities and capacity to execute planned programs including the added requirements from the 2018 Nuclear Posture Review.

We will work through the Nuclear Weapons Council to synchronize DOD acquisition programs with NNSA stockpile activities. Risks include the need for continued support from Congress for predictable and stable program funding and recruiting, training, and equipping the personnel in the workforce to execute the programs.

Mr. GARAMENDI. Does DOD have a comprehensive nuclear modernization plan (to complement NNSA's Stockpile Stewardship and Modernization Plan) identifying major programs and capability sustainment and modernization requirements?

General HYTEN. Yes, section 1043 of the FY12 NDAA requires an annual report to Congress on all Service sustainment/modernization plans with ten-year cost projection. Additionally, Service modernization plans are included in the Nuclear Weapons Council (NWC) long-range Strategic Plan. The NWC plan aligns DOD platform programs and DOE NNSA stockpile and infrastructure programs to ensure capabilities are concurrently developed to meet deterrence requirements.

Mr. GARAMENDI. We have never used SSBNs for a single low-yield nuclear warhead. SSBNs are our survivable second strike capability to deter a massive nuclear exchange. Are we changing the mission or use of this platform? Would using a D5 to launch a low-yield nuclear weapons risk undermining strategic requirements? Specifically, is there any increased risk that a submarine, having launched a single low-yield missile, would be vulnerable to attack? Could DOD meet strategic requirements if the sub cannot escape safely after such a launch?

General HYTEN. No, the introduction of a low yield SLBM will not change the operating patterns of SSBNs. Our nuclear forces are postured to decisively respond to a range of contingencies spanning various levels of conflict. Further, our SSBNs are designed and operated in such a manner as to minimize opportunities for adversaries to conduct prosecution. Employment of a low-yield weapon will not introduce additional risk to SSBN survivability.

The Triad provides the inherent flexibility required to mitigate the loss of any single platform.

Mr. GARAMENDI. Given Putin's statements this week about Russia's nuclear weapons capability, do you see a risk of a nuclear arms race with Russia? How can this risk be mitigated?

General HYTEN. The systems President Putin mentioned in his recent speech do not change the military balance, nor do they necessitate a change in our deterrence posture. With that said, as the Commander of USSTRATCOM, it is my responsibility to ensure this country can deter and respond to any threat. The recommendations made in the NPR to modernize our TRIAD and incorporate select low-yield supplements are needed to maintain and enhance the flexibility, diversity and responsiveness of U.S. nuclear forces now and in the future.

I completely agree with former Secretary of Defense Carter's statement, "... During the past 25 years, the United States has made no major new investments in its nuclear forces, yet other countries have conducted vigorous buildups.

This history does not support the contention that U.S. investments fuel the nuclear programs of others. . .'' (Spring 2018 Newsletter, Harvard School of Government's Belfer Center).

Mr. GARAMENDI. Why do you recommend pursuing new low-yield nuclear weapon options? The U.S. arsenal already deploys low-yield options with the B61 (which we are spending $12 billion to modernize) and the planned LRSO. Why do we need other options, including redeploying a new sea-launched nuclear cruise missile and fielding a low-yield option for the submarine-launched D5 missile?

General HYTEN. Russian strategy, doctrine, and capabilities call for the limited use of nuclear weapons to coerce NATO, and to defeat NATO conventional forces. They would not have adopted this strategy and doctrine, and would not be expending resources to modernize and expand their non-strategic nuclear forces (which are already approximately ten times larger than NATO's), if they perceived current U.S. and NATO nuclear posture as sufficient to deter such nuclear use.

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