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Before the

Subcommittee on Strategic Forces

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

HEARING TO RECEIVE TESTIMONY ON
U.S. NUCLEAR WEAPONS POLICY, PROGRAMS, AND
STRATEGY IN REVIEW OF THE DEFENSE AUTHORIZATION
REQUEST FOR FISCAL YEAR 2020 AND THE FUTURE YEARS
DEFENSE PROGRAM

Wednesday, May 1, 2019

Washington, D.C.

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U.S. Senate

Subcommittee on Strategic Forces

Committee on Armed Services

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The subcommittee met, pursuant to notice, at 2:29 p.m. in Room SR-222, Russell Senate Office Building, Hon. Deb Fischer, chairman of the subcommittee, presiding.

Committee Members Present: Senators Fischer [presiding], Cotton, Rounds, Cramer, Hawley, King, Heinrich, and Jones.

OPENING STATEMENT OF HON. DEB FISCHER, U.S. SENATOR FROM NEBRASKA

Senator Fischer: The hearing will come to order.

The subcommittee meets today to receive testimony on U.S. nuclear weapons policy, programs, and strategy in review of the administration's budget request for fiscal year 2020.

Testifying before the subcommittee today are: Ellen Lord, the Under Secretary of Defense for Acquisition and Sustainment; David Trachtenberg, the Deputy Under Secretary of Defense for Policy; General Timothy Ray, the Commander of Air Force Global Strike Command; and Admiral Johnny Wolfe, the Director of the Navy's Strategic Systems Programs.

Thank you for appearing before us today. And I also want to express my particular appreciation for this Department's emphasis of the importance of nuclear deterrence.

Secretary Lord, your prepared testimony unequivocally describes nuclear deterrence as, quote, "the Department of Defense's highest priority," close quote, echoing similar comments from a number of other senior leaders, such as General Dunford. As you all know, a lack of senior leader attention has been a challenge for the nuclear enterprise in the past, and I am pleased to see this Department is properly prioritizing this issue.

Similarly, I think there is bipartisan recognition in Congress that if foreign nuclear threats continue to grow and our platforms reach the end of their serviceable lives, modernization is necessary to ensure our deterrent remains credible. We look forward to hearing from each of you about your efforts in this regard, and your assessment of how any delay or disruption would impact our ability to met deterrence requirements.

Your full statements will be made part of the record. But, first, I would like to recognize the Ranking Member for any comments he would like to make.

Senator Heinrich.

STATEMENT OF HON. MARTIN HEINRICH, U.S. SENATOR FROM NEW MEXICO

Senator Heinrich: Thank you. And let me thank Chairwoman Fischer for holding today's hearing.

And I also want to thank our witnesses for taking the time to testify today. We very much appreciate your service to our country and to the job that each of you perform.

Every national security action we take is underpinned by our deterrent. So, it's important we continue its modernization. Some have claimed it's too expensive. But, even in its peak years, the Congressional Budget Office has said that its cost, relative to the DOD budget, will only be 6 percent. I have often said that 6 cents on the dollar to protect us from World War III or an existential threat is money well invested.

There is a lot to cover in today's hearing, besides modernization. I'm concerned about pulling out of the INF Treaty with nothing to show for it. And it seems to me that we have given Putin everything he wanted since he broached this topic with the administration officials 15 years ago. And, in turn, we have left our NATO allies in a bind.

I am concerned about the upcoming expiration of the New START Treaty. If we let this treaty expire, it'll be the first time since 1972 that we have not had some form of arms control treaty in place for strategic stability. The Senate

ratified the New START Treaty, with the condition of modernizing the triad, which President Obama certified in February of 2011, and which continues to this day. Arms control and modernization should go hand in hand. I take this relationship very seriously.

I am encouraged that the President has recently announced that he wants to include China in an arms control discussion, and to add nonstrategic nuclear weapons as a future arms control agreement. But, he should renew the New START Treaty first, and that should be our priority.

Let me close on this issue of pit production. I continue to question the validity of producing 80 pits per year by 2030 under the split production option proposed by the NNSA. The Institute for Defense Analysis found that none of the options analyzed by the NNSA can be expected to provide 80 pits per year by 2030, and none of the options were demonstrably better than the others. I'd like to note, however, that, when the NNSA analyzed a split production at the Savannah River site, it was for 80 pits a year by 2030, at an added cost of some $14 billion to the taxpayer. I am very leery, to say the least, of the split option, given that an independent report said it will not even achieve by 2030, and it will cost even more than the additional $14 billion to be requested by Congress.

Madam Secretary, you certified to this committee on May

10th, 2018, that the recommended alternative is, quote, "likely to meet pit production timelines and requirements responsive to military requirements," end quote, and it is also, quote, "cost-effective and has reasonable near-term and lifecycle costs that are minimized to the extent practicable compared to other alternatives." I would like to ask that, in light of this report, that you report back to the committee on reevaluation of your certification.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator Heinrich: And again, thank you today for coming, and I look forward to hearing all of your testimony.

Senator Fischer: Thank you, Senator Heinrich.

As I visited with the panel before we started the hearing, we do have four votes beginning at 3 o'clock, and so I have asked them to submit their statements for the record. I also suggested to them, during the questioning, if they feel there is a part of their prepared statements that they would like to include it at that point during the questioning, they were free to do so at that time.

[The prepared statements of Ms. Lord, Mr. Trachtenberg, General Ray, and Admiral Wolfe follow:]

Senator Fischer: With that, I will begin our first round of questioning.

Secretary Lord, after the last two administrations, we've consistently heard testimony that nuclear modernization programs such as GBSD have no margin for error. Can you talk about how fragile the situation is and the impact that funding cuts or additional delays would have on our ability to meet deterrence requirements?

Ms. Lord: Absolutely. Thank you, Chairman.

We are living now with Cold War technology, and we have put off modernizing the triad multiple -- for multiple decades. So, now we have no margin. We need to move forward. So, any cut in funding would essentially have us unilaterally stand down, in terms our -- of our capability to have a credible nuclear deterrent.

Senator Fischer: When you say we have no room for any delay in meeting these modernization requirements, could you speak to us, in this setting, on the importance of our keeping up with that in regard to what our adversaries, specifically Russia and China, are doing, and why that is so important for us to know, why it's important for the people of this country to know?

Ms. Lord: Absolutely. Russia, in particular, has developed many capabilities, whether they be UUVs or different types of warheads, over recent years. Our systems

will be timing out, in terms of their capability, between 2020 and 2040. We must modernize what we have so that we can replace our systems, one for one. GBSD, for instance, there is no margins to do another SLEP on Minuteman III, because not only would it be more expensive than developing GBSD, but you would not have the resiliency in the capability, because you would not have the modern equipment, you would not have the actual capabilities from a functional-range point of view, warhead capability. So, we need to, by 2028, start replacing.

Senator Fischer: Okay, thank you.

General Ray, if you have anything to add to that. Some have argued that reducing the number of deployed Minuteman ICBMs to 300 or 200 missiles would be a way to extend the life of the current system and allow the delay for its replacement. Can you talk about why this isn't accurate?

General Ray: Yes, ma'am. Thank you for the question. Three dimensions to that:

The first, of course, 400 to 450 weapons deployed is a very high threshold for our enemies to derail us. It would consume up to two-thirds of an enemy arsenal to disarm us.

The second piece of that is the near-term challenge, as Secretary Lord talked about, is the timing. When we -- last night, we had the successful launch of a Minuteman III. That testing program will consume the boosters and the

propulsion system rocket engines much faster if we continue on this pace. We don't have a program to replace that.

But, when I consider the affordability formula, it features some things, such as modularity. It features a competitive environment with a good tech baseline that we own. It features a good tech base of engineers and individuals.

When I think about foregoing the GBSD, we forego a value proposition that gives us the modularity that lets Admiral Wolfe and I work together on improvements in a more affordable fashion. It also helps us in the competitive environment, since we would own the tech baseline for GBSD. But, moreover, we forego a value proposition of reducing our convoys by upwards of two-thirds and the number of times that we would penetrate the sites by two-thirds. And so, when we think about what the digital engineering is helping us learn, and help drive the sustainment dollars down by billions, what we give up is probably even more than just the pricetag of a new program.

Senator Fischer: You know, you talk about affordability. And, General Rand, your predecessor, he testified that it would save -- the GBSD would save around a billion dollars compared to performing another life extension program. General Hyten, in his annual posture statement, said that the further life extension of Minuteman

III ICBM is not cost-effective, nor will it provide a weapon system capable of adapting to advancing technology.

Can you talk a little bit more about the savings that are associated with the GBSD in greater detail, and some of the other benefits that it's going to provide?

General Ray: Ma'am, I think the big help to us right now -- and we've talked with your staff -- is the digital engineering that is operating at an unprecedented level of this acquisition program. Secretary Roper has already declared this is the best acquisition program he has. The risk that we're reducing by the numerous design cycles -- a typical design effort would take one, maybe two, manual efforts. We're on our ninth design cycle on this side of the milestone. So, the insights about how to manage requirements, the ability to create a competitive environment of areas that will give us a good return on investment for areas that we value, and then the insights on how to sustain, are tremendous to us, in terms of the ability to work with the Navy on new components and the ability to do things smartly in the design, right up front, that the two primes are telling us that it's a much more competitive environment and much more affordable approach.

Senator Fischer: Okay. Thank you.

Senator Heinrich.

Senator Heinrich: Under Secretary Lord, as you know,

we are modernizing three weapons platforms, a new cruise missile, and multiple warhead systems, all concurrently. What contingency plans do you have if any one of these programs slips?

Ms. Lord: We are the point where, for decades, we have put out -- put off modernizing these programs. And right now, we have no choice but to move forward, and move forward in lockstep with NNSA. So, we are focused on GBSD, particularly, and looking at plutonium pit production, making sure we have 30 by 2026, that we have 80 per year by 2030. So, we do not have any margin, at this point, because, for decades, we have delayed.

Senator Heinrich: I don't disagree. And certainly, I'm fully committed to working with you to ensure that Los Alamos can get to 30 by 2026, safely and expeditiously. However, from a broader good-government perspective, I'm going to remain determined to hold both yourself and others accountable for the decision to split plutonium production and to build, really, an entirely new plutonium pit production complex. The independent IDA study found that none of the plutonium pit options were demonstrably better than any of the others. So, I have to ask, How did the Nuclear Weapons Council select an option that is literally twice the cost of other options and will force appropriators to find an additional 14 billion-plus dollars?

Ms. Lord: The Nuclear Weapons Council looked at the data we had. Since we do not yet have a conceptual design, we do not have firm cost data. If we get funding for the conceptual design in the 2020 budget, we will have it by the end of 2020. We will then be able to understand the cost implications. The IDA study that was done said there was no significant difference in the cost between the two alternatives.

Senator Heinrich: So, the --

Ms. Lord: The multiple alternatives.

Senator Heinrich: -- need for redundancy has never been in the nuclear complex, or at least articulated, and was nowhere in the Nuclear Posture Review, was nowhere in the analysis of alternatives, or even the engineering analysis conducted by the Pentagon and the NNSA. So, when did the Nuclear Weapons Council decide that redundancy was a factor, even "the" factor, for splitting pit production?

Ms. Lord: The Nuclear Weapons Council focused on the Nuclear Posture Review, which states, "An effective, responsive, and resilient nuclear weapons infrastructure is essential to the U.S. capacity to adapt flexibly to shifting requirements." So, what we looked at was a resilient capability. It wasn't particularly redundant. What we found the best option to be was to, first, produce the 30 pits --

Senator Heinrich: What does that mean, "resilient"? What are -- how are --

Ms. Lord: It means --

Senator Heinrich: -- how do you define that?

Ms. Lord: -- we have the ability to have multiple options to meet our requirements. So, we will start at Los Alamos with the trained workforce we have there. We have to add about 1,000 jobs a year at Los Alamos, given everything we have in front of us. We then will look at South Carolina, where we have a facility that can be upgraded, and a large workforce in a community that's very, very interested in moving forward.

So, what we are doing is, we are standing up, first, Los Alamos, then we will move to Savannah River, and move on from there with two different options to mitigate any type of catastrophes we might have in one or the other, and also be able to tap into the workforces of each of the communities.

Senator Heinrich: How do you square your certification that this pit -- that this split production option is on track to get us where we need to be, when the independent study comes to such a starkly different conclusion?

Ms. Lord: The independent study said that there was no path without risk involved, and that there was no significant differences in all the risks. So, we're waiting

for the full study to be done at the end of June, and then, every day we don't move forward with the conceptual design and on to the follow-on details, we will slip. So, we think this is the best path forward right now, but we need to get down to work, and continue with it.

Senator Heinrich: General Ray, your bomber roadmap states that we'll field 175 bombers, about 100 B-21s, and 75 B-52s, when all is said done, out in the 2030s. This has concerned some people, but it seems to me, as long as we're producing B-21s, we have the flexibility, 5 or 20 years from now, to change that number, up or down. Do you believe this number is set in stone, or is it more flexible than that?

General Ray: It is more flexible. The bomber roadmap that we have right now is the product of a programmatically-driven solution. The analysis that we're looking at for inside of OSD and inside the Air Force has revealed it will be at the forefront of anything that happens. The Air Force we need has shown a growth in bomber squadrons. The CSBA study and the MITRE study show a growth in that. And so, my role here now in Global Strike Command is to set the foundation for smart and good growth.

The decision point to look closely at the B-21 production rate is in about the 2024 timeframe. So, we've got a very good program, very good program managers there, and we all agree that, once we get to that point, we have

some options. But, in the meantime, there are some sustainment options we're going to look at to make the bomber roadmap that we have more affordable. I'm convinced we're underinvested in the countermaritime dimension of long-range strike. We're underinvested in hypersonics and, potentially, counterspace. So, my job is to set the foundation for the Chief and the Secretary to have some more innovative options, here, in the next 2 or 3 years, to expand beyond the minimum of 100 B-21s and 75 B-52s.

Senator Heinrich: Thank you.

Senator Fischer: Thank you, Senator Heinrich.

Senator Rounds.

Senator Rounds: Thank you, Madam Chair.

General Ray, first of all, I really appreciate that the Secretary of the Air Force's strategic decision to choose the Ellsworth Air Force Base as the first B-21 base is moving forward. Since the Air Force has requested funding in FY20 for two weapons-generation facilities -- and these would be at Warren and Malmstrom, if I'm correct -- when would we expect to see funding requested for these weapons-generation facilities at all of the bomb wings, including Ellsworth Air Force Base, to support the B-21? Assuming FY21 beginning or otherwise?

General Ray: Sir, the process we're following now, of course, with the MOB declaration and the NEPA process that

we started that you and I talked about is one piece of it. The Secretary insisted that we rethink, and we reported back to Congress recently that we needed to reevaluate our WGF game plan. We are proud to say that there is a good plan for the ICBM WGFs, and that remains on track. The Secretary has given us a homework assignment. We've gone back and looked at that very closely, broadened our team to collaborate on some more insightful and appropriate approaches to this. She's not blessed our roadmap just yet. And so, I'd like to be able to come back to you and to the committee with a more informed long-term game plan that would -- just like Senator Heinrich's question, that would accompany the right bomber roadmap and give you better insights.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator Rounds: Timeframe for that report?

General Ray: Sir, I think the decision from the Secretary should be in the next couple of months. And then our ability to refine that, I'd like to come back to you by the end of the fiscal year, if that's possible.

Senator Rounds: So, it would still be available to maintain on-track planned developments for FY21 appropriations.

General Ray: Sir, if I could come back to you with that assessment, I can give you a better sense of when that would be.

Senator Rounds: My point being, at this point, there is not an anticipated delay in the construction processes, because all of these new facilities need to be in place before that -- the B-21 can actually be facilitated, correct?

General Ray: Sir, not every facility has to be there. And that's part of the SATAF planning that's beginning now, and part of the NEPA process. But, the sequencing of these things has been perturbated with the supplemental request for the emergency relief in our MILCON game plan. So, we need to come back and then lay out the roadmap for the timing of how we're going to do all these steps. And I think we should include all the bomber bases to give us clarity. The closest challenge that we have right now is

for the Barksdale facility, based on the B-52 in the current nuclear mission, and then to add on, where we can, for the additional B-21s.

Senator Rounds: Okay.

For Secretary Lord and General Ray, both. Have you found that the nuclear command, control, and communications acquisition and operational management -- has it improved since Secretary Mattis designated U.S. Strategic Command as the enterprise lead and the Under Secretary of Defense for Acquisition and Sustainment as acquisition lead and primary policymaker for OSD?

Ms. Lord: I would like to address that. Yes, I believe it has. In fact, we just very recently completed an NC3 Enterprise Review with General Hyten, myself, General Selva, the DepSecDef, and we are reviewing all the key programs, looking at fragility, making sure we're addressing key items. Again, we need to modernize and sustain at the same time. We're, again, dealing with Cold War technology that needs to be upgraded. What is particularly key, in my role in A&S, is that I have your support for the 14 billets in the 2020 NDAA that I need in order to help staff and move this forward.

Senator Rounds: Thank you.

General Ray?

General Ray: Sir, it's emphatically helped us as a

team, greater coordination at all levels and echelons of influence and stewardship. The additional pieces, we're adding some more operationally relevant approaches to how we're doing business so that you can manage the risk. I have great coordination with OSD, the Joint Staff, and certainly with General Hyten. I believe that's going to be very helpful. I've asked for an independent review to come in and relook at the NC3 center that is in my command. When it stood up, it was stood up without the STRATCOM role and the oversight from OSD. And I believe, with some minor modifications, we can be even more effective.

Senator Rounds: Thank you.

I'd just -- very quickly -- and I'm not even sure who to address this to, so I'll offer it and then ask whoever feels comfortable with response. Would it be fair to say that both our near-peer competitors, China and Russia, have both significant advantages today, in terms of the upgrades to their NC3 development and upgrades that basically push us to make certain that we are getting ours done just to be in a competitive and at least -- at least in a near-peer position over the next couple of years?

Mr. Trachtenberg: Senator Rounds, if I could, just generally, I would say, without getting into specific capabilities of Russia or China, I would note that both of those countries have very aggressive modernization programs

underway, and have had them underway for quite some time. One of the basic premises contained within the National Defense Strategy is that we are at risk of losing our competitive advantages to potential adversaries; hence, the need -- and I would echo the comments of my colleagues here, also -- with respect to the importance of maintaining our NC3 architecture and infrastructure.

From my perspective, sir, the nuclear command, control, communications enterprise is the glue that holds our nuclear deterrent together. And hence, it is critically important to ensure the robustness and reliability of that, going forward.

Senator Rounds: Thank you.

Thank you, Madam Chair.

Senator Fischer: Thank you, Senator Rounds.

Senator King.

Senator King: Thank you, Madam Chair.

Ms. Lord, in your -- Secretary Lord, in your testimony, you used the word "credibility." Do you feel that, if we slip on our schedule -- for example, with Columbia or otherwise in the -- in all of the elements that we're trying to modernize at one time, that that diminishes credibility, which, in turn, diminishes deterrence?

Ms. Lord: Absolutely.

Senator King: And that strikes me as one of the great

dangers here. Do you see -- as you do your planning and your charts, are there gaps? Are there places where -- for example, I'm -- you know, and this isn't -- this is hypothetical, but Columbia doesn't come on until a certain period. And Ohio, we're starting to be retired. There's -- are there gaps in our --

Ms. Lord: Absolutely. There's a one-for-one with Ohio and Colombia. And that's why, for instance, Columbia is one of the major defense acquisition programs that I milestoned decision authority for, and I review that very, very closely. In fact, on Friday morning, I have a quarterly review on it, and I look very closely at what we have for capacity in our shipyards to build it.

Senator King: Am I understanding there's been some issues about the tubes?

Ms. Lord: We have a common missile chamber, actually, with the U.K., and the first ones being fabricated are for the Dreadnought, the U.K. sub. They're up in Quonset Point, Rhode Island, right now. There were some cracks on them. It's a technically challenging weld. There were issues with the nondestructive tests that were being done. We identified it. We've gotten to root-cause analysis and, I think, irreversible corrective action. We're working very closely with a key contractor --

Senator King: Is that going to cause the schedule to

slip?

Ms. Lord: We think it is contained. I will find out, again, on Friday. But, right now, there shouldn't be. I'll defer to Admiral Wolfe.

Admiral Wolfe: Yes, ma'am -- yes, sir, if I could answer that.

So, right now, based on, as Secretary Lord said, knowing what we know about the welds, getting to root cause, we still have margin in the program. We have 11 months' margin. If you look at how the Navy has responded to this, both the Navy and General Dynamics Electric Boat, we've staffed up, we've realized several things. One is, it's the fragility of the industrial base, which we've talked about already. So, making sure that we are getting that industrial base not only where it needs to be, but to get it to status quo and sustain it. That's why we've stood up, in the Navy, a separate program executive offices just for Columbia, because this is the Navy's number-one acquisition program. And so, we're taking all the steps to make sure we've got the proper oversight to keep this on track.

Senator King: I --

Ms. Lord: If I may, just one more point on that.

This is so very, very important to us that, frankly, after the last Columbia review, I had the week before Christmas, I had Phebe Novakovic, GEO of GD, come in on the

Friday afternoon before Christmas to sit down and talk about how the supply chain was being managed and what we have for staffing. So, very -- working very, very tightly with Hondo Geurts, in the Navy, on that one.

Senator King: Well, deterrence is the heart of our defensive posture, and credibility is the heart of deterrence. So, that's obviously of great concern.

Mr. Trachtenberg, do we need to match every new Russian nuclear-armed delivery vehicle?

Mr. Trachtenberg: Absolutely not, Senator King. And it's certainly not our intent to match what Russia is doing, weapon for weapon. Our basic concern is that we have seen, through the development of Russian military doctrine, some of the exercises they have conducted, that -- our concern is that the Russians may believe that they have some kind of exploitable advantage through the development of capabilities that they have developed. And through our Nuclear Posture Review and the programs that we have asked for support for to develop, we hope that we can certainly convince the Russians not to miscalculate and believe that anything they are doing would offer them an advantage that could be exploitable or that -- where they could miscalculate, and competition could lead to conflict. So -- but, no, the short answer to your question is no.

Senator King: But, clearly, this is an area of --

again, getting back to deterrence, we need to be sure that they don't feel that they have a weapon that can penetrate our defenses or will otherwise go unresponded.

Let me ask a -- one more question. This is sort of an odd question, but you'll have to excuse it. I'm spending a lot of my time these days in the cyber arena. And one of the big issues in cyber is attribution. Where is the attack coming from? Is there a potential for attribution issues in this area, particularly where you're talking about an underwater, unmanned vehicle, knowing where it is going. We need to know who to respond to and what the response will be. Am I just making something up, here, or is this an issue?

Mr. Trachtenberg: No, sir. I would not say you're making anything up, here, Senator. I think you're absolutely right to focus on cyber as an element in the deterrence equation. What we have seen, certainly over the past decade or so, is the development of cyber as a domain where we need to pay particular attention to what is happening and what our adversaries are doing. Attribution is certainly one element when it comes to our overall deterrent and the credibility of that deterrent and how we might respond. Cyber is a piece of that.

So, you're absolutely correct to flag that. That is one of the additional technologies and capabilities that we

need to look at, and are looking at, as a Department.

Senator King: Well, it's certainly a piece of -- and it's -- a big part of our upgrade is command and control. I'm out of time, but that's as important as anything else we're talking about here, I think.

Mr. Trachtenberg: Absolutely.

Senator King: Thank you.

Thank you, Madam Chair.

Senator Fischer: Thank you, Senator King.

Senator Cramer.

Senator Cramer: Thank you, Madam Chair.

And this is was not something I was going to ask about, but just to, maybe, follow up on that line of thought. How important is space to that, then? You know, and -- because we're going to have a decision to make, here, on Space Force and what happens next. Maybe, you know, whoever wants to talk about that could add to that. But, Secretary, it seemed like -- seems like the appropriate time to ask.

Ms. Lord: Perhaps I'll make a comment and then pass it down through.

When you talk about nuclear command and control, space is an incredibly important portion of that to make sure we have secure and resilient communications. And our space layer is critical for that. The cybersecurity of that is another piece. And that's why we're working so hard to make

sure that have hardened systems, and why so many of these systems need to be upgraded, because they're just not capable of being hardened today.

But, I'll hand over.

Mr. Trachtenberg: Yeah, just briefly, Senator Cramer. I would agree with that completely. Space is critically important. Almost everything that we do nowadays relies, to some degree, on space and space systems. Key aspects of our NC3 architecture -- for example, missile warning or command and control -- are space-based. And so, we very much need to be focused on the survivability, the resilience, and the capability of those space-based elements for the deterrence mission, as well as for others, as well.

Senator Cramer: General Ray?

General Ray: Senator, I think one of the other dimensions is to go beyond just simply the importance when we think about where we are. And one of the new roles I have under Strategic Command, is as the JFAC. And so, one of the jobs I do is to coordinate the air and space dimension. With space leaving STRATCOM, I now have to be the space coordinating authority. And so, I will tell you, the indications and warning dimension, to get to Senator King's point about attribution, is foundational to everything we're doing. But, what it's allowed us to do in this last exercise is to actually map kinetic and nonkinetic

threats to our -- from a space, cyber, and physical domain against our nuclear command and control and indications warnings. So, we have a better roadmap now, at the very classified level, about what to contend with, and it'll help us with the recipe of how to deal with those coming.

Senator Cramer: That's probably as important in a submarine as it is anyplace, huh?

Admiral Wolfe: Yes, sir. And I would tell you, cybersecurity has to be at the forefront of everything that we do, moving forward. And we do kind of -- some people would say, "Well, you're on a submarine, you're kind of out, right? You don't need to worry about that." We all need to worry about it. And so, it doesn't matter what you're doing. And everything that we're doing in the Navy, whether it be NC3, whether it be what we're doing in the Trident, cybersecurity is a part of everything that we're putting in place, moving forward.

Senator Cramer: I'm going to resist the temptation to just go on, on the whole Space Force idea, but -- and get, maybe, General Ray, from you, a more -- a broader, just, elaboration on the importance of the entire triad. Because, as we're having this discussion of modernization, there are those, you know, in office who think that, you know, three legs is at least one too many, if not two too many. And maybe if you can just describe, strategically, why they're

all relevant, if you believe they are, that that would be helpful.

General Ray: Yes, sir. My perspective comes from being the Deputy Commander in European Command, where -- the head of a combatant command on a daily basis in support of General Scaparotti. I've learned to look at our triad in the context of a modernized Chinese triad, a modernized triad-plus on the part of the Russians, and clearly in the minds of our allies. Any change in that has to make a collectively more safer plan. And so, our triad is foundational. It has to be where we go. And, as we've said, we have to modernize it. Any change in that has to be done to where we do change the rest of the dynamic, and do our allies believe that the world is a safer place? And I think there's no solution right now I can imagine that would say to back off the triad. You heard Secretary Mattis, one of the brightest military minds, said, "I questioned it, and I cannot solve the deterrent reducing from the triad."

Mr. Trachtenberg: If I could --

Senator Cramer: Please.

Mr. Trachtenberg: May I, Senator?

Senator Cramer: Please.

Mr. Trachtenberg: Just briefly, to pick up on what General Ray said. I think, in terms of the triad, I tend to look at the capabilities the triad brings for deterrence as

complementary rather than redundant, because I do believe each of the legs brings unique characteristics that are useful in a deterrence perspective. I think that is why every administration has reiterated the importance of maintaining all three legs of the triad. We can discuss the numbers for each, but, in terms of the critical and unique capabilities each brings, whether it is reliable command and control, resilience, survivability of the sea-based leg, adaptability and flexibility of the air-breathing leg, the bombers, the geographic dispersion of ICBMs, each brings a unique component to the overall deterrence equation, which complicates the -- any attack calculations that a potential adversary might have. And I think that is sort of the inherent value of the triad.

Senator Cramer: Oh, I appreciate it. That was a great summary. I'm glad you took the time to say it, because I was even intrigued by the -- you know, Senator Heinrich's question about resiliency versus redundancy. And I think I just heard how the two are the same -- the two parts of the same umbrella, if you will. And so, I appreciate that. Thank you.

Yield back.

Senator Fischer: Thank you, Senator Cramer.

The vote has been called, but we're going to continue with the hearing. We're moving pretty well through

questions. I would urge members to stay, or go vote and come back, because we'll have time for more questions.

Secretary Trachtenberg -- oh, Senator Manchin, if you're ready, would you like to ask questions right now?

[Laughter.]

Senator Fischer: I'll let you do first -- your first round. That's putting you on the spot. Walk in the door.

Senator Manchin: This will be to Secretary Lord. You and the other witnesses' testimony highlights the multiple modernization programs that we're undergoing right now. We have the ground-based strategic deterrent, the long-range standoff weapon, the B61, and -12, and B-21. The list goes on and on. So, I'm concerned about the testimony, such as Secretary Trachtenberg's written testimony that highlights the rapid growth of China's nuclear forces in the face of all the corporate espionage we know they're conducting. So, my question would be -- and I'm sorry if it's already been asked about -- but, what steps are you taking to ensure that our nuclear modernization efforts remains with us and aren't stolen by the Chinese or Russians or any other -- from our subcontractors? The biggest problem we've seen to be as it goes down the food chain, procurement? It seems to be wide open for the taking.

Ms. Lord: Senator, this is really on point, because, if there's any area that has received enhanced focus over

the last 18 months more than any other, it's cybersecurity. So, in my responsibility for the defense industrial base, I've looked at the problem and seen that we have a fundamental issue, that we have NIST cybersecurity standards which are very hard to interpret if you're a contractor, in terms of how you actually instantiate those. So, what we're doing right now is, by the end of this year, we will have a national cybersecurity standard, just like we have ISO standards for quality.

Senator Manchin: Well, who's maintaining the visibility on those contracts to ensure that nuclear projects aren't being exposed the same way the Navy's undersea programs were last year?

Ms. Lord: We are, as I have responsibility for a number of the larger programs, like GBSD and so forth, so it's a milestone decision authority. So, as we go through the reviews, we look at what our supply base is doing, how they are secure, both in their software development, especially, but in terms of physical security, as well. We work very closely with intel --

Senator Manchin: Do you believe that the --

Ms. Lord: -- with DSS --

Senator Manchin: Do you believe the primes should be held responsible --

Ms. Lord: Absolutely.

Senator Manchin: -- and held accountable --

Ms. Lord: Absolutely.

Senator Manchin: -- for their down- --

Ms. Lord: Absolutely. And therein lies the problem. Typically, primes are pretty good. Maybe the next level down. But, they lose sight, and they -- what we did, just about 3 months ago, was, we introduced new cybersecurity clauses that are going in all the contracts, moving forward. So, it is --

Senator Manchin: How does that change the whole --

Ms. Lord: -- absolutely clear --

Senator Manchin: -- business model -- I'm so sorry, because our time will be running -- how does it change the business model, when there's a sub, three rungs down the chain, who doesn't want to, basically, give you pertinent information or have someone else have access to that information? I mean, I just couldn't believe what's going on and how vulnerable we have been over the years. And there's no wonder why China has accelerated the way --

Ms. Lord: Yeah.

Senator Manchin: -- they did --

Ms. Lord: So --

Senator Manchin: -- access they've had to the system.

Ms. Lord: I don't disagree with you. And it all starts with standards that you can measure to, that have

metrics, so we know what right looks like, in terms of cybersecurity. Then it turns into educating the workforce. So, we're standing up courses at our Defense Acquisition University. So, it comes to really making sure our acquisition workforce has the skillsets they need, and that we communicate that to our industrial base, and that we have actual metrics that say, "This is what" --

Senator Manchin: And if there's not financial penalties to the prime, this'll never work.

Ms. Lord: You're absolutely correct. And, in fact, we go right back to source-selection criteria. If it --

Senator Manchin: I'm sure, any primes out there, you're not really happy with this line of questioning. But, it is the way it's evolved over the years. It's --

Ms. Lord: Right. And --

Senator Manchin: -- got to change.

Ms. Lord: And we have never clearly said what is acceptable, what is unacceptable. So, we'll start at contract award. But, it's a critical issue. And we're having ongoing discussions. We meet quarterly with the three largest industrial associations.

Senator Manchin: If I may -- and I'm sure anybody else-- if you can keep us --

Ms. Lord: Absolutely.

Senator Manchin: -- informed. If we can --

Ms. Lord: Absolutely.

Senator Manchin: -- look and see what you all have been able to do --

Ms. Lord: I would very much like to -- we can come and give you a briefing --

Senator Manchin: Love to. I've spoke to primes and everything, and I've spoke to the subs all the way down the food chain. And there is nothing that's, basically, linking them together. Sometimes the primes don't even know who the subs are far enough down the food chain.

Ms. Lord: Well, this is exactly what we've gotten at, and exactly what's going to change.

Senator Manchin: Well, I appreciate it very -- I appreciate all of y'all here. But, we just here -- we're just -- we want to help you. Our job is to help you.

Ms. Lord: Thank you.

Senator Manchin: And we want to work together.

Thank you very much.

I'm so sorry. We're all running to vote.

Senator Heinrich [presiding]: Well, Senator Manchin, it's just you and I now, so you don't have to apologize. You can even sneak one more in, if you want, before you go.

[Laughter.]

Senator Heinrich: He couldn't pass that up. So, you do one more, and then I've got a whole pile here. So --

Senator Manchin: The other one I would have is the relationship between the Missile Defense Agency and the Space Development Agency, to ensure that all aspect of nuclear deterrent missions are being executed under a united line of effort. If you have something along those --

Ms. Lord: Well, we are just now standing up the Space Development Agency, and what programs are within what entity are just being adjudicated now.

Senator Manchin: General Ray, I think that you highlighted the much-needed improvements in our satellite systems from advanced extremely high frequency satellites in orbit and production of that. How's that coming along?

General Ray: Sir, we're making good progress with the terminals and the elements. We visited the team at Raytheon recently, and all that progress is where we'd like it. We were behind, and we had to restructure the program. So, I'm pleased with it, going forward. And the key will be to keep on the primes to execute as we've laid it out.

Senator Manchin: And, Secretary Trachtenberg, your written testimony included a couple of mentions of Iran as a nation trying to tip the balance of power. Would you want to expand on that?

Mr. Trachtenberg: Yes, sir. You're correct, we were very much concerned, in terms of looking at Iran and seeing where Iran is going. Iran continues to be the prime

supporter of terrorism. Iran continues to develop ballistic missiles -- ballistic missile capabilities. And so, we're watching that very carefully.

We face a variety of threats today, not just from Russia and China, as large competitors, but also there are still threats that we need to deal with from North Korea and also, potentially, Iran, as well. So, we are looking at them.

Senator Manchin: Are we selling missiles to Saudis?

Mr. Trachtenberg: Are we --

Senator Manchin: Are we providing access to missiles to the Saudis?

Mr. Trachtenberg: I'm not sure what missile tech -- are you talking about actual missiles?

Senator Manchin: Uh-huh.

Mr. Trachtenberg: If I could, I'd --

Senator Manchin: That's fine.

Mr. Trachtenberg: -- I will get back to you on that. I'd like to take that one for the record.

Senator Manchin: Yeah. I would, too.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator Heinrich: Thanks, Senator Manchin.

No surprise I want to return for a moment to pit production again. Under Secretary Lord, one of -- my understanding is that we're probably a few years away from a CD2 estimated independent cost analysis of what the real, sort of, concrete and steel costs are going to look like at the Savannah River site. Probably out in 2021-2022. So, how do you certify now that we're on track, when we don't really know even what those costs are going to look like yet?

Ms. Lord: We work very, very closely with NNSA under the framework of the Nuclear Weapons Council. And what we have from them is the engineering analysis, moving forward. And, as they move into conceptual design, we will begin to get clear track as to the actual dollars. But, the estimates we have right now, they certify they believe in, and we back them up, and we believe this is the best path forward from the alternatives we've seen so far.

Senator Heinrich: One of the reasons why I'm dubious is because we've done the big-box thing before. We had the CMRR plan, and that sort of collapsed, in and of its own weight, and everyone moved to a modular plan, which seemed to have a great deal of traction. And now we're back to the big-box plan.

I'm going to switch gears here. General Ray, I know

the Nuclear Weapons Center at Kirtland coordinates nuclear certification of all systems involved with nuclear weapons. How concerned are you about the current staff levels there?

General Ray: Sir, I'm concerned about that staff level and the rest of -- what it's going to take to deliver, when it comes to that, into the right sustainment game plan team, the right team to go from design to execution, managing that talent base. I'm worried about that. And the NC3 enterprise, in terms of the expertise. So, broadly, we're in competition for a great deal of high-tech talent. And so, as we look across the entire spectrum, it's something that we, as a team, have to continue to drive a competitive environment --

Senator Heinrich: Yeah.

General Ray: -- and then to do very good planning that let's us forecast what we need. I think the digital engineering that's in front of us gives us the chance to bring in a lot of young talent, which is what we're really in the need of doing to make sure that -- as Secretary Lord talked about, this is Cold War stuff. We may have a lot of older engineers in the game. And we need to bring in more and more of the young folks in the STEM program --

Senator Heinrich: And you have the incentives to be able to -- to make that happen?

General Ray: Sir, that manpower plays in a different

pool, but I certainly would be willing to follow up with some more insights later, after collaborating with the team.

Ms. Lord: May I comment on that?

Senator Manchin: Under Secretary?

Ms. Lord: We -- one of the things we are very much challenged by is getting the talent we need at the right time. And one of the ideas we've had, particularly on the acquisition side to get individuals with the technical credibility to run these acquisition programs, is, we are floating the idea of having sort of an ROTC for acquisition professionals, where, for every year of college we would pay for, we would get 2 years' service back. So, we would have 8 years of very technically qualified people to help run these programs.

Senator Fischer [presiding]: Thank you, Senator Heinrich.

We're just going to keep going.

Secretary Trachtenberg, from a policy point of view, can you discuss the importance of NATO remaining a nuclear alliance, and how close allies with independent nuclear deterrent capabilities and who are committed to NATO complement U.S. decisionmaking and deterrence posture?

Mr. Trachtenberg: Well, certainly, Chairman Fischer. Absolutely. It is critically important. NATO is a nuclear alliance. The NATO statements that have been made reaffirm

that NATO is a nuclear alliance. We have very good relationships, of course, certainly with the U.K. and France, that are both nuclear partners -- or nuclear states, I should say. And maintaining alliance unity, when it comes to the importance of sustaining a robust nuclear deterrent that is in the benefit, not just of the United States, but in the benefit of the alliance as a whole, is critically important. We engage in discussions at various levels with our NATO allies repeatedly. And we have found a good sense of unity and an understanding among our allies, in terms of U.S. policy and the need for modernization and the need for our alliance to remain a nuclear-capable one.

Senator Fischer: Thank you.

And, Mr. Secretary, in the course of the Nuclear Posture Review, did the Department gather allied feedback on the idea of adopting a no-first-use policy? And what was that?

Mr. Trachtenberg: We discussed a variety of issues in the course of developing the Nuclear Posture Review with allies. The no-first-use issue, of course, is one that has come up repeatedly, in terms of discussions and debates over whether or not it makes sense, from an alliance perspective, to go down that path. From our perspective -- and I believe it is shared by our allies, as well, that we have spoken with -- a no-first-use-of-nuclear-weapons policy would be

counterproductive to deterrence. It could actually undermine deterrence. It could undermine the assurance value that our nuclear deterrent brings to our allies. And it could also, by lowering allied confidence that the United States, in essence, has their backs and would be prepared to defend our -- allied security, at any level of conflict -- could push at least some of our allies to consider the acquisition of nuclear weapons, themselves.

So, I would argue, from the standpoint of a no-first-use policy, I see that, generally, as a negative, at a -- from a variety of levels, including the nonproliferation aspect of U.S. policy. I happen to believe that our current policy and our current extended deterrence, the so-called nuclear umbrella of security that we provide to others, is perhaps one of the best and most successful nonproliferation policies that the United States has implemented.

Senator Fischer: Thank you.

Secretary Lord, we keep hearing arguments that DOD can't afford everything it wants, it must set priorities, and that we should cut spending on nuclear forces to prioritize other things, like space or cyber. The implication here is that the Department is only requesting funds for nuclear modernization as a result of failing to prioritize. But, as I noted in my opening statement, I believe the opposite is true. Can you elaborate on the

Department's priority level for nuclear deterrence?

Ms. Lord: Three Secretaries of Defense have called nuclear deterrence the DOD's number-one priority. It's very clear. Our National Defense Strategy calls it out. The Nuclear Posture Review goes into much detail about how we deliver on that. And, as we've been talking about, we really are dealing with Cold War technology right now. We have weapons that are decades over what was supposed to be their useful life. And we are out of time. We need to continue on the path we're on, or we are going to fall behind and not have the nuclear deterrence that we enjoy today.

Senator Fischer: Secretary Trachtenberg, would you like to add anything?

Mr. Trachtenberg: I would, Senator. The only thing I would add is that, when you look at what our nuclear deterrent buys for us, I would argue that it is a relatively inexpensive investment, because that is the ultimate guarantor of our security. And it -- in terms of the amount of fiscal resources we invest in the modernization program, it is a relatively small fraction overall of the DOD budget, approximately 3-and-a-half percent. At the peak of the planned modernization program, that percentage may rise to about -- somewhere between 6 or 7 percent of DOD spending, still much less, in percentage terms, than what we spent

during the modernization cycles of the 1960s and the 1980s. So, from the standpoint of what nuclear deterrence gets us, I would have to argue that I think it's an actual -- actually a bargain.

Senator Fischer: Thank you.

And, Mr. Secretary, critics argue that the Department plans to develop an intermediate-range system in response to Russia's violation of the INF Treaty will serve no purpose unless a foreign nation agrees to host them. And therefore, the program shouldn't proceed without such an agreement. Of course, this view does overlook the fact that a mobile system could be deployed in response to future provocation, and potential adversaries would have to contend with this fact. Could you speak to this issue and why the Department believes intermediate-range systems are a critical part of our response to Russia's dismantling of an arms control treaty?

Mr. Trachtenberg: Of course, Senator. And I appreciate your characterization in -- of Russia's dismantling of an arms control treaty, because, obviously, as a consequence of Russia's clear violation of that treaty, and also, I might add, consistent with the Sense of Congress expressed in the FY19 NDAA, the United States suspended its obligations under the treaty, and we also gave notice of our intent to withdraw from it. It is, in fact, Russia, I would

argue, that has abandoned the treaty as a result of its violation. And our allies, as I mentioned previously, support the actions we have taken in response.

Yes, we are moving forward, as a result, with developing conventionally-armed ground-launched intermediate-range missile capabilities. What sort of system we ultimately develop will be driven by our assessment of military requirements and, of course, in consultation with the Congress and with our allies and partners. So, it remains to be seen where we will go, but I will say -- and Senator Heinrich mentioned, at the start -- made a comment -- I think he expressed some concerns that we had --

Senator Fischer: I'm sure when he returns, he'll be visiting with you about it.

Mr. Trachtenberg: -- absolutely -- that we had gotten out of the INF treaty with nothing to show for it. The point I would make there, Senator, is, we have nothing today, because, for 30-some years, we have been in strict compliance with the terms of the INF treaty that prohibited the kinds of capabilities that, if the treaty terminates in August of this year, we will then be free to develop and proceed with. So --

Senator Fischer: Right. And it is a bilateral treaty. It does not take into account what other countries, such as

China, may be developing. And I think it ties our hands with regard to other nations when they are able to move freely about. And I agree with you on the Russians, and in regard to the INF, as well.

Mr. Trachtenberg: Yes.

Senator Fischer: So, thank you.

I see we have been joined by Senator Hawley. A lot of back-and-forth here. So, if you are ready for questions, just coming in, please go ahead, Senator.

Senator Hawley: Okay. Thank you very much, Madam Chair.

General Ray, I appreciated the phone call that you and I had a few weeks ago about the stationing plans for the B-21. Obviously, we're very excited about that in my home State. My staff had the chance to visit Whiteman again last week. And I am -- we're -- we are delighted about the future, here.

As we've discussed the need to modernize all three legs of the nuclear triad, I think this may be a good opportunity to talk about why the bomber leg is so important. And so, I wonder, General Ray, if you could talk to us a little bit about the rationale behind maintaining, and indeed updating, burnishing this particular leg of the triad and its significance for our defense.

General Ray: Yes, sir. The comment has been made by

Secretary Trachtenberg about the extended deterrence dimension of a bomber leg. The very visible and flexible element is just one piece. So, when our allies look at the extended deterrence and the counterproliferation dimension, they probably, more than likely, look at the bomber first, the ability to escalate and send the signal with a generation of the bomber force, the flexibility of the bomber force both for penetrating and for a standoff capability. When I consider the would-be adversaries' defensive systems and the complexity of that, the clear need to go after those challenges with penetrating and standoff to assure no sanctuary of anything that could harm the United States is one of the other particular dimensions to it. But, I think when you just step back and consider all three legs, the interrelated dimensions of this, when we think about modernizing an old fleet to a new fleet, the inherent risk on all three legs, I watch every single step of the way for the old fleet to the new fleet and knowing how will I close any of the gaps, the bomber is my most flexible and visible piece.

Mr. Trachtenberg: May I add a comment, Senator --

Senator Hawley: Yes, Mr. Secretary.

Mr. Trachtenberg: -- just briefly? The bomber leg of the triad is the only leg of the triad that is essentially recallable. And, because of the speed, its relative

slowness compared to a ballistic missile, it gives decisionmakers additional time and space to try to negotiate or reduce, in a crisis, the opportunity for miscalculation or any unintended or potential escalation. So, the bomber plays a unique role in the triad, for those reasons, as well.

Senator Hawley: Yeah, thank you for that. That's very significant. And thank you for pointing that out.

Let me also invite you to touch on why it's important to have different platforms that are able to fulfill this dimension. And, you know, it's probably hard to find two aircraft that are more different, for instance, than the B-2 or the B-52. So, speak to that, if you would, General, and, Mr. Secretary, if you want to, or anyone else.

General Ray: Yes, sir. I fielded a question earlier in this hearing about the size of the bomber roadmap. First of all, the size of the conventional bomber fleet is the sizing mechanism for how many bombers we have. The analysis we have tells us where a conventional campaign begins to falter without bombers. And I can't go into that here, but all the studies are now showing a broader number of bombers are required, beyond a minimum of 100 B-21s and 76 B-52s. We just pulled one out of the boneyard to get it refurbished. So, when I think about the standoff, the stand-in, and the complementary capabilities, and the need

to grow beyond these two platforms to keep our options open as much as we can in the short term, to provide the leadership the chance to make informed programmatic decisions, here, in the future, the roadmap tells us, in about the '24 timeframe, we'll be able to make an insightful acquisition-ramp decision for the B-21. Meanwhile, we've got a lot of work to do with sustainment for the B-1, the B-52, and the -- the B-52. All three of the current bombers.

Senator Hawley: Mr. Secretary, would you like to add to that?

Mr. Trachtenberg: I certainly concur with what General Ray has said. Agree wholeheartedly.

Senator Hawley: Great. Thank you very much.

My time is nearly expired, so I'll yield back. Thank you, Madam Chair.

Senator Fischer: Since we are in votes and we've had two rounds of questions, I think, Senator Hawley, if you are satisfied with your questioning time --

Senator Hawley: I might just ask one thing, since you're offering --

Senator Fischer: I never should open it up to you.

Senator Hawley: -- Madam Chair.

Senator Fischer: I know better.

[Laughter.]

Senator Hawley: Never give a lawyer a chance at just

one other question.

And this is a -- you may already have tested on this, so forgive me if you have. You -- feel free to be extremely brief. But, I think it's so important as we think about the debate about nuclear modernization and about low-yield tactical nuclear weapons, which I'm sure you've discussed, but it never hurts to get it on the record again. There has been robust debate in this body, as you know, and in the other chamber, about a no-first-use policy, about whether we should even have low-yield tactical weapons; now that we have them, whether we should deploy them. If you could, just speak to, from a strategic perspective and a defense perspective, the importance of this class of weapons, from a defensive perspective, and why we need them, why we need to deploy them, and what role they play in our overall defense scheme.

Go ahead, Mr. Secretary.

Mr. Trachtenberg: If I could, briefly, Senator.

Senator Hawley: Yes, please.

Mr. Trachtenberg: I think that's a great -- that is a great question. And the only thing I would say is that deterrence really is in the eye of the deteree, so to speak. What we want to do, and the reason why we have chosen to go forward on the path that we have chosen, with the low-yield ballistic missile, is because we have looked at what the

Russians have been doing, in particular, and it is a cause of great concern, in terms of, I mentioned earlier, their doctrine, their military exercises, the possibility that they may miscalculate and believe that they could use a weapon --

Senator Hawley: And you mean their "escalate to de-escalate" doctrine.

Mr. Trachtenberg: Absolutely, sir. Absolutely. And so, what we are trying to do is, we are trying to foreclose any miscalculation on the part of any adversary, broadly speaking, that they may believe they have some kind of an advantage that is exploitable, that they could challenge us to take the next step that we wouldn't want them to take because they believe they've got a capability that allows them to do something where our response would be to either acquiesce or to escalate to a higher level of violence, which is something we clearly do not want to do. And so, we're doing that, not to lower our threshold for nuclear use, but to raise the threshold in the minds of an adversary, or potential adversary, when it comes to nuclear use.

General Ray: Sir, my last 3 years in Europe in the competitive environment with the Russians, it's very clear in my mind they will look for the line, and they'll go right up to it, and they'll operate inside of that gray zone.

Secretary Trachtenberg's right, you have to eliminate the gray zone and create a gray zone for them so they do not miscalculate and they do not intimidate us in front of our allies.

Senator Hawley: Thank you very much.

Thank you, Madam Chair.

Senator Fischer: Thank you, Senator.

With that, I would like to thank the panel members for their testimony today. I'll remind you that your opening statements will be included in the record. So, if you have more to add to those, feel free to do so.

And, with that, I will adjourn the hearing. Thank you.

[Whereupon, at 3:36 p.m., the hearing was adjourned.]