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WEBINAR

CHALLENGES FOR THE BIDEN ADMINISTRATION: ADDRESSING THE EVOLVING AIR AND MISSILE THREAT

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P R O C E E D I N G S

MR. ROSE: Good afternoon. My name is Frank Rose and I'm a senior fellow and co-director for the Center for Security, Strategy, and Technology at the Brookings Institution. Welcome to today's event titled "Challenges for the Biden Administration: Addressing the Evolving Air and Missile Threat."

Over the last decade air and missile threats to the United States and its allies has changed dramatically. A decade ago ballistic missiles represented the main air and missile threat to the United States and its allies. Today the threat environment has become much more complex and includes new systems, like drones, rockets, and hypersonic weapons.

Given the changed nature of the threat, how should the incoming Biden administration adjust U.S. air and missile defense policy and programs to effectively counter this evolving threat? Well, we have a great panel of experts to help us answer this question today. Our panelists include Laura Grego, a senior scientist with the Global Security Program at the Union of Concerned Scientists, Tom Karako, a senior fellow and director of the Missile Defense Project at the Center for Strategic and International Studies, and Rear Admiral Archer Macy (Ret.), the former director of the Joint Integrated Air and Missile Defense Organization at the Pentagon.

Let me say a few things about today's program before we begin. I will start by asking our panelists several questions for the first 40 minutes or so of the program. I'll then take some questions from the audience. If you would like to ask a question, members of the audience can submit their questions by either emailing events@Brookings.edu or via Twitter at #SecurityStragetyTech. Again, email us at events@Brookings.edu or Tweet us at #SecurityStrategyTech.

On that note, let's begin

Tom, let me start with you. You've been, from your perch at the Center for Strategic and International Studies, really examining the air and missile threat over the past decade. And I'd be interested, when you look at this threat, what are you most concerned about? Is it ballistic missiles, is it hypersonics, unmanned aerial vehicles? You know, if you were making a recommendation to the Biden administration, how would you prioritize the threats?

So, over to you.

MR. KARAKO: Well, thank you, Frank. Thanks for the invite and it's a pleasure to be here with Dr. Grego and Admiral Macy, both from whom I've learned a lot over the years.

You know, I think simply put, I think your set up really introduces the concept, but it's not just about rogue state ballistic missiles anymore, right. But unfortunately the conversation, the missile defense conversation, is in some respects stuck in some deep ruts, ruts that kind of go back and carry a lot of I would say intellectual baggage from the cold war and the post-Cold War period. If I could wave my magic want and eliminate the acronym BMD from our current missile defense conversation I would because the threat has changed so dramatically that fixating merely on the BMD aspect of countering — not merely defending but countering various air and missile threats is just — it's distracting from the scope and the complexity of it. I tend to emphasize it's not just about one particular bright shiny object, one particular kind of threat, hypersonic, this, that, or the other thing, but it's the diversity and the imaginative combination across this threat spectrum. In other words, in the specter of a complex and integrated attack, basically combined arms of all this different air and missile threats, from guided RAM, rockets, artillery, and mortars, to various cruise missiles, anti-ship and land attack, to increasingly maneuverable — let's just say quasi ballistic missiles. And then you've got your upper end of hypersonic gliders and the like.

But, again, the important thing is not to fixate on any one particular type or kind, but rather to think about the operational concepts and the way in which all these different things can be mixed and matched. Don't take my word for it. Look at what the Iranians did in their attacks on Abqaiq in September 2019 and look at the — frankly, the Armenian Azerbaijan conflict of this past year, where you see, again, a pretty wicked and imaginative combined arms effort, with UAVs, cruise missiles, artillery, and the like.

MR. ROSE: Tom, you're using the word wicked. Sometimes I think you're from Massachusetts even though you're not.

MR. KARAKO: I've never been accused of that, Frank.

MR. ROSE: Now, speaking of Massachusetts, Laura, you're in Cambridge. Anything you or Arch have to add to what Tom had to say?

MS. GREGO: No. I'd be happy to hear what Arch has to say.

ADMIRAL MACY: Yeah, Tom's point is exactly on. And I think for some years now all of the attention has been paid to ballistic missiles and then to the latest, the advent of hypersonic live vehicles. And I think we forget that in the grand discussion of missile defense, all of the Americans in the continental United States who have died as a result of missile attack or of air attack did not die from ballistic missiles or hypersonics, it was three airplanes hitting buildings. So why their belief that we can only consider a rather narrow category of certainly very difficult but low inventory and highly complex threats, has and still continues to bother me.

The answer is, you know, what are you going to do. And I personally don't believe that even with the use of a ballistic missile that we're really looking — that the high probability event is a massive overwhelming attack. I mean war is conducted for political reasons, as Clausewitz has told us. So three conventional weapons hitting three cities, that's going to have a strategic effect when people think about it. So I think it's a very wide ranging threat.

And the points Tom made, I mean it was a strategic event with those missiles hit Abqaiq.

Thanks.

MR. ROSE: Thanks so much, Arch.

And that kind of leads me to the next question. Much more complex threat to the United States and our allies are facing today. So the question that I have for you, Arch, is this, okay. You ran the 2010 Ballistic Missile Defense Review during the Obama administration. You know, as someone who actually ran a missile defense review, I'd be interested in knowing your thoughts as to whether you believe the Biden administration should conduct a new missile defense review or instead integrate air and missile defense into a broader defense strategy review.

ADMIRAL MACY: Well, the simple answer is yes. Putting a little bit more detail on that, I think there's a couple of points. The first one is the review, as all of the reviews, need to be timely, they also need to be cohesive and actionable. When we did the 2010 Review, myself and Dr. Brad Roberts, the final report was released not quite a few days over a year after President Obama took office. And from a practical matter, the key decisions were made and announced within nine months. So there was time to get moving on them. It was EPAA and other things that were related to various programmatic decisions.

The subsequent Review took over two years and didn't actually direct much of anything except a bunch of studies. So it was an effort — well, I'm sure a lot of people — and I know a lot of people put a lot of time and effort into it, but it turned out to be basically useless. So the first thing is, if you're going to do a review, it's got to be in a focused timely manner and it's got to have results that people can go forward with. And another review is not a result.

The other part that goes with it — sort of expanding (inaudible) — I think you were — was the Missile Defense Review — the Air and Missile Defense Review needs to be coherent and cohesive with all the other strategic reviews that the administration has to do.

I think Admiral Richards from STRATCOM was on point when he observed that we need a broader based strategic review, as opposed to parceling things out into a whole bunch of different areas. I don't think you can do one review fits all, but I think that you can do a set of coordinate efforts. Cross functional teams, or whatever you choice of words may be, to look at these different key areas, the national strategy defense, air and missile, cyber, nuclear posture, etc. We don't need to reinvent them. A lot of work has been done by a lot of really good people from multiple administrations over the last 20 years.

So where are we? What does today look like? What does the future look like different from what it looked like 10 years ago when Brad and I did this. These teams need to be given the horsepower and the focus to do this, to review where we are and to see where we need to go and to make those decisions and to coordinate these things, like air threat, missile threat, and so forth. It's going to need to be under the — I would propose that they need to be tasked, given specific questions, and provided with a defined end date — I'll say the first of October of this year. They've got to be under the direct supervision of someone with the horsepower — and I'll say (inaudible) — to go forward and make it happen with reviews and time scales, get the word out. Then you can take that result, which really forms the first part of the intent of the QDR, and then do the second part, which is what programs and changes and force instruction you need to carry it forward. But you need to do these reviews, you need to include a review of the air and missile defense threat, because it has grown and it has grown in extent. And it needs to be moved out. I mean a threat — a review done in two years is a waste of time.

I grew up in the Navy and one of our heroes is Arleigh Burke. So I'm going to wrap up

my initial comments with a rule of his — which is a fine rule — is to get going sooner than anticipated, travel faster than expected, and arrive before you're due. And if you don't do that, then don't bother.

Thanks.

MR. ROSE: Thanks so much, Arch.

Tom, Laura, anything you'd like to add?

MR. KARAKO: Yeah, I'd jump in. I would, first of all, just underline what Admiral Macy said there in terms of the criteria laid out. The corollary to laying out those criteria though is if you — if one doesn't think those can actually be met, that it could not be a good idea. And so I would just caution a little bit. I think — I've heard a lot of casual talk about dispensing with a missile defense review in favor of a broad integrated deterrence review. But, hey, everybody is in favor of more integration. Who doesn't want more integration?

But, you know, Arch's recommendation about cross functional teams and these kinds of things, there's different ways to get there. It doesn't necessarily mean a nice glossy essay that substitutes for deep dives is the right way to get there. And so we all want integration, but there's different ways to achieve it.

And I worry a little bit that if it was combined with, for instance, the nuclear posture review, that the nuclear issue would suck all the oxygen out of the room and preclude a deep dive on the missile defense side.

But, you know, Frank, the subtitle to your event today is addressing the challenges, not just defending, but addressing the challenges. And there's basically three legs to the stool here. One is nuclear deterrence, one is active missile defense, and the third is missile defeat. So think conventional striking related activities.

The latter two, however, I would suggest would be very useful if combined in a review. And, again, don't take my word for it. This is what Congress told administration to do back in calendar year 2016. They had three big topics and 18 sub elements. That was called — that was supposed to be called the Missile Defeat Review. Unfortunately, what became the 2019 Missile Defense Review, didn't address those things.

So, frankly, the impetus for a relatively more comprehensive missile defeat effort was put

out there by Congress in 2016 calendar year and kind of ignored. That does I think benefit re-upping.

Thank you.

MR. ROSE: Great. Thank so much, Tom.

Laura, let's come to you know. We've talked about this changing threat, we've talked about the need to conduct a review, but I'd be interested from your perspective — and I know you have a new piece in Arms Control Today about this — is what type of air and missile defense capabilities should the United States be investing in to defeat these threats? And alternatively, from your perspective, are there programs you think we should scale back or eliminate?

MS. GREGO: Well, thanks, Frank, and thanks for the invitation to be here.

Certainly, so my perch is outside the Beltway and I really think I spend most of my time thinking about strategic or homeland missile defense and how that interacts with nuclear issues. And from what I hear, you know, looking back over the last four years, I think the Biden administration really wants to be thoughtful and not chase every threat. I think it wants to do really hard-nosed cost-benefit analyses on these new systems. And we have enormous challenges that we need to meet — recovering from the pandemic and the economic shocks and the climate change emergency. So I'm going to be really careful about how we define security and don't expand the budget in the way we did in the past four years. The CBO. How many people here noted the report that was just released which assessed what the plan in the previous missile defense review would cost over the next decade? And that was going to be a massive $176 billion and a 40% increase over, you know, the plans as the past administration came into office. You know, nearly half of that is on strategic missile defense.

And I think we have to be really clear not to get into a tail chase. You know, the original impetus for ballistic missile defense was a few relatively unsophisticated missiles and now that — the mandate seems to be to try to keep ahead of the North Korean threat. And we found it very difficult to do that cost effectively with the existing system. You look at the GMD system and that's, you know, scheduled to cost nearly $70 billion and still struggles to perform and is unlikely to keep up with the threat. There — it has many fairly simply ways to defeat that system.

So I would encourage a real hard-nosed look at this. And I find myself agreeing with Vice Admiral Macy's partner in the past Missile Defense Review, Brad Roberts, who called for a sort of

slimming down that mandate from keeping ahead of the threat to basically restoring the modest goal of protection against limited strikes, basically at the most. And I think the U.S. should instead, you know, focus on those that can be most clearly distinguished as regional systems and consider and a strategic missile defense as a limited case.

You know, it's been policy that the U.S. would not be trying to challenge Russian and Chinese ballistic missile inventories with missile defense, but that's been clouded a bit, you know, with declaratory statements by the past administration, but also by exploring systems that could have a global footprint, like space based missile defenses and a large expansion of the Aegis System. You know, Congress has been pretty skeptical about that and it has asked for a real review of what that strategy is and what that would look like. So it remains to be seen if they would put their money behind that.

So looking at space based missile defense, you know, study after study has shown that they're, you know, going to be wildly expensive. And I think even as large costs come down and components are miniaturized, they're still wildly expensive and pretty directly overcome. I think it would be great to just set that aside sort of on a permanent basis and maybe as a part of a negotiated — you know, a negotiated arrangement in exchange for something the United States wants.

And I think it should look carefully at other systems that were — that sort of advanced over the last four years, like F-35 based interceptor, which the CBO estimated would cost around $25-40 billion to stand up and probably cost $10-20 billion a year to operate. And that would be just really a niche capability that you would have to have air superiority before you could use it. I think if you want to take a really, really close look at not only the economic costs of your systems, the wildly expensive ones like the F-35, but the strategic costs, like the space based ones.

MR. ROSE: Great. Thanks very much, Laura.

Tom, Arch, would you like to add any points?

MR. KARAKO: Sure, I'd jump in briefly. You know look, I think that this is — it all comes down to the programs and the budgets. I do believe that we could be doing something significantly different than what we're going now while staying within basically the same budget profile. And I think we're going to need to stay within that budget profile.

And I'll just say, you know, right after the 2019 Missile Defense Review came out I wrote

a critique of it saying that while it was really good on kind of admiring the threat, what it recommended in terms of the program and the program of record wasn't that great. And it still retained that focus on the rogue state ballistic missile program of record. And it's the counter UAS, it's the cruise missile defense stuff. And, yes, it is going to be beginning on the hypersonic maneuverable glide vehicle defense. That's going to be different.

So what's going to important though is when you think about adapting our missile defense enterprise to the renewed reality of long-term strategic competition with the likes of China, that we don't get weighed down again by that bagged. Even the Trump administration 2019 MDR said, look, we're not going to try to create a protection against all the ICBMs. But neither the Obama administration nor the Trump administration disavowed defending against the regional air and missile threats. And so I think this is an opportunity to really double down on regional and feeder air and missile defense, for the likes of Guam, and for all the other aspects of forward forces in particular, so that we can support our broad deterrence and defense goals.

But I would also highlight my colleague Dr. Grego on here has written a lot about the importance of joint requirements and we are on the path I think to something pretty different. And in February of last year the JROC approved the requirements for the next generation interceptor. That is a different means of acquisition and that is a much longer time frame than what we've been doing kind of the GMD stuff in the past.

So in terms of money and dollars and programs, look, we got to life extend and improve the reliability of GMD and all that kind of stuff, but we may have to accept a little bit of risk in order to kind of go back and engineer and do the right thing in the long-term. And that's going to be a different enterprise than what we've done in the past.

MR. ROSE: Great. Thanks so much, Tom.

Arch, do you have anything on this point?

ADMIRAL MACY: Just a real quick reminder, as I alluded to earlier, that ballistic missiles — and for that matter, hypersonic missiles — are not the only threat. We know there are people who will fly airplanes into buildings. The difference between a cruise missile and business jet is whether somebody is on the front end or not. That's all. And our ability to deal with cruise missiles, to deal with

aircraft threats, either for the homeland or regionally, has lagged for many years because of the interest and the focus on ballistic missiles. They certainly have attractiveness in their speed of delivery, but from a political effect, and certainly from a physical effect for the people in the target area, it doesn't really matter how the threat got there and how fast it was going when it arrived.

I really think that a serious look has to be taken at our air defense, i.e., non-ballistic missile, non-space touching threats.

Over.

MR. ROSE: Great. Thanks so much, Arch.

And, Tom, if I recall correctly, the name of your critique of the Trump administration's Missile Defense Review was "Masterpiece Theater" — if I recall correctly. (Laughing)

MR. KARAKO: That's one of them.

MR. ROSE: Okay, great.

Well, Arch, I'm actually going to stay with you. Arch, throughout your career you were actively engaged with working with our allies on air missile defense and other issues. Indeed, you were the U.S. representative to the NATO Air Defense Committee.

Now, I think we can all agree in most scenarios where U.S. air and missile defense capabilities are deployed we will likely be operating in a coalition with allies.

So, Arch, my question to you is given the fact that coalition operations are likely going to continue to be in our future for the foreseeable future, what do you think the Biden administration can do to improve our ability to cooperate and conduct air and missile defense operations with allies and partners around the world?

ADMIRAL MACY: Well, the first thing we need to do is to acknowledge the need of the United States for those partners and allies. We need to make a change from the communications that have been coming out of Washington for the last four years. We have to acknowledge the necessity of other nations and their assistance with us to gain the best possible defense of both our homeland and regional interests and theirs. It just contributes to a stable world within the role of loss.

The cooperation is back to what we have been doing. It's a little bit of back to the future. I found it very encouraging that I believe that Secretary of Defense Austin's first phone call in office, first

official phone call was to Secretary General Stoltenberg at NATO. I think that said something and it was important to say.

What do we do? The cooperation is the planning, the common agreement on technical approaches and so forth, burden sharing. It's not that all participants have to do everything, but that they all join in allocating and accomplishing what has to be done. And then you look at the places where the challenges exist. First I geography. The world is round and physics says that you can't track from one place everywhere, so you need sensors, you need engagement capabilities, which account for the fact that you have limitations on track and engage. You need to have different capabilities, different systems with different frequencies and different altitudes, such that you don't have single point failure or single point defeat possibilities. You have to have resilience, such that if one system fails or is beaten or is defeated, others can still take on the threat.

The point here is that the technical means exist. There is all kinds of work going on across many, many nations. The nations that are partners of ours that want to participate in a free and common world where we are safe from the aggression of those who would change the world to be only in their sight, can maximize their benefits by allocating responsibility, jointly in on the different things that have to be done, dividing it up and agreeing to it. That this is not a challenge to individual freedoms, it's not a challenge to individual territoriality. The point is that by working together — and we know how to do that — it's reestablishing the links, it's reestablishing the conversations, it's reestablishing the intent to participate in an effective fashion with our allies and potential partners and making it clear to people who would challenge that you're just not going to happen, it's not going to get there. You're not going to succeed, today is not going to be the day.

Over.

MR. ROSE: Laura, Tom, anything you'd like to add?

MR. KARAKO: Go ahead, Tom.

MR. KARAKO: I'll just jump in with a different aspect, and that is, again, about defeating the threat, as well as defending against it.

A lot of our allies are doing a lot of really good stuff in terms of acquisition of — you know, whether it be Patriots or other — Aegis and other active defenses. And that's all for the great, we

want to encourage that. But I like to quote — since Arch is doing the quotes — my favorite line from the Middle Defense Review of 2019 is from the preface where it said that the scale and urgency of change required to restore our conventional and missile defense overmatch should not be underestimated.

And on this aspect, in terms of our allies and partners, I think frankly we needed to take a hard look at our arms control and our strike FMS kind of things. My outlook on this is what I call the Marie Kondo view of FMS, which is if it doesn't bring you joy, thank it for its service and send it on its way. And folks like the Australians and the Japanese are taking a hard look that maybe they may need some new long range strike capabilities. And when the Japanese start opening a conversation about strike, you need to pay attention.

So we ought to ask what stands in the way, whether it be MTCR or anything else — does it bring us joy and is it standing in the way of helping our allies and partners, especially in the Asia Pacific, get the capabilities that they need.

MR. ROSE: Great. Thanks so much, Tom.

Laura, anything on that point? No.

Well, I'm actually going to come to you on an issue we really haven't discussed in detail today. And that is the impact of U.S. missile defenses on strategic stability calculations of Russia and China?

As you well know, traditionally both of those countries have expressed concern that U.S. strategic missile defense, especially space based capabilities, represent an existential threat to their strategic deterrence.

I'd be interested in getting your view on the following question: how can the U.S. continue to deploy effective missile defense while at the same time maintain a level of strategic stability with Russia and China?

MS. GREGO: Thanks, Frank.

Well, isn't that the question. I mean we definitely see the strategic costs incurred by unlimited missile defense sort of already happening. I think Russia and China, as you said, see the unbounded nature of the defense missile defense programs as a long-term concern and the investments they're making seems to back up that assessment. I'm sure it's not the only reason, there are always

domestic and industrial concerns, but you see Russia has unveiled six new nuclear delivery systems. And one thing they have in common is that they are designed to get around missile defenses. And you see China changing some of its way of doing things, including equipping their ICBMs with multiple warheads.

So it's not in our interest — neither of those things are in our interest to happen. So we have to think about how you shift that. And Russia has, of course, explicitly linked its participation in further arms control discussions to willingness of the U.S. to talk about missile defense. So left unbounded or left unaddressed, you know, it will affect nuclear security.

So I would also mention that sort of amplifying those concerns — it's not just missile defense on its own, it's the advances in intelligence and surveillance to support targeting of silo based immobile ICBMs with U.S. conventional strike systems and the concern that that would take out command and control.

So it's really tied to this first strike fear that the U.S. would be able to mop up whatever they had left. And that's really a particularly Chinese concern. But it's not just a missile defense issue, of course, it's nuclear posture.

So there have certainly been ideas advanced to looking at how you might build a missile defense system that would effectively counter North Korean missiles, but have limited ability to engage Chinese arsenals. And that's tricky, right. So some of those ideas that are — a regional boost phase missile defense, for example — and China may be wondering why we aren't actively pursuing those, you know. In the pats it's because it wasn't at all clear that that was technically viable or operationally sustainable or, you know, cost effective. And there are people who suggest that in certain circumstances it might work.

I think having a real assessment of that system would be helpful. If it's clear that it wouldn't work, that might be reassuring to China. I think also as Russia and China get more experience with their own mid-course missile defenses — you see them starting work on those — they may understand just how limited that capability is and they might be less concerned about U.S. missile defenses. You know, I think a limited GMD system of course we all know poses absolutely no threat to their strategic deterrence, but I think when you see large numbers of interceptors, such as potentially

hundreds of strategically capable Aegis interceptors, they may feel the need to include that in their plans.

And of course there's an arms control question. You know, I think the U.S. should be willing to think about limits on systems that are of dubious utility in order to get concessions on things that really the United States would like to see, like potentially limits on technical nuclear weapons.

So there's no magic wand, there's not technical magic wand as far as I can see, but whole of government approach I think can help allay some of these strategic problems that strategic missile defense can create.

MR. ROSE: Great. Thanks very much, Laura.

Laura, the point you raised when you said "the Russians aren't concerned about the current GMD system," I think you're absolutely right. And it reminds me of a briefing I participated in back in late 2011, early 2012, when a senior Russian delegation was in Washington, D.C. And, Arch, you may have been at that meeting. During the meeting a very senior Russian general gave a presentation of how U.S. missile defenses could impact Russia's strategic deterrent. And they basically has Aegis ships — a slide showing Aegis ships shooting down Russian ICBMs. So I asked the general a question, I said, general, that's a very, very interesting slide, but let me ask you a question. How fast are you attributing the interceptor on the ship. And he looked at me with a totally straight face and he said, ten kilometers per second velocity burnout. And I came back to him and I said, general, if you can find me a company that can build a sea-based interceptor with a velocity burnout of 10 kilometers per second, let me know, because I would like to buy stock in that company. And he came back to me very quickly and he said, "you'll get there". And I think that's the big concern that the Russians have. Not so much with the current set of capabilities, but future leap head technology, especially space based capabilities.

On that note, Tom, Arch, anything else you'd like to add on this point?

Tom?

MR. KARAKO: I guess on this issue I think it's important to honor the threat. And I think, as Laura said, as you said, as the Russian colleague said, I don't — and frankly as the Bush, Obama, and Trump administrations all kind of assumed — if the Russians want to attack the United States with a very significant force, they can. Neither our GMD nor some SMs are really going to stop that.

So in terms of this stuff, I like to repair to Rose Gottemoeller when she was in the State

Department back in the Obama administration. She said, look, kind of paraphrasing something Condi Rice said years ago, which is we have fewer — even our plans are going to be fewer than what the Russians have. This is not a strategic stability issue. This is not going to disrupt the 1,500+ delivery systems. So just in terms of order of magnitude, it's just I think getting nowhere close to that kind of a question. Plus, whether it's GMD or SM32A, this is also XO. When we put the Russians and the Soviets on notice about our aspirations for even space-based XO intercept three years ago, and the threat has gone lower. That's what they've been doing, they've been going lower. So if we're just going to be fielding a bunch of — and spending a lot of money on 2As and this sort of stuff, first of all, it will cost a lot, and, secondly, it won't be enough because the threat has changed and I just don't believe it's enough — going to be nearly enough to really disrupt that strategic stability.

MR. ROSE: Great. Arch, anything you'd like to add?

ADMIRAL MACY: I was in that meeting with you and I was in a number of other meetings like that in Washington and Moscow and in Brussels. And I frankly find the Russian comments along that line to be somewhat disingenuous because I have a great deal of respect for their engineers and their knowledge of what is possible within technology and chemistry and what VBO you can put into a 21 inch diameter, or even a 30 inch diameter missile. So I think they're saying that because it advances their argument even though they know better. I like to remind them that one of the largest craters on the moon is named for a guy named Tsiolkovsky, who was one of the original Russian rocket engineers. The Russians know about rockets and they know about what can be done. So I find these comments to be, as I said, somewhat either disingenuous or the gentleman that you were talking about that was in that meeting with us is unknowledgeable of what his people understand — which I don't think is the case.

So I think that those kinds of comments are proffered for political effect rather than an accurate assessment.

MR. ROSE: Great. Thanks so much, Arch.

Now we're going to move in during this last 20 minutes of the program to some of the audience questions. And, you know, we've gotten a lot of questions from the audience on North Korea's evolving ballistic missile capabilities. Indeed, over the last decade we were really focused on their land based intercontinental ballistic missiles, but, you know, like other countries, they're evolving their

capabilities and potentially they look like they're going to deploy a sea launch ballistic missile.

So a question for all the panelists, how should we deal with the North Korean missile threat, which is fundamentally changing?

So who would like to start on that?

Tom, how about you?

MR. KARAKO: Look, the North Korean missile threat has been marching along, advancing, presumably with some foreign assistance, as the Rumsfeld Commission predicted so long ago — presumably getting some kind of foreign assistance there. But I think at some point in the first instance we need to deal with the things that are most tested and protect our foreign forces. But as we look at the GMD enterprise and the plans to kind of get beyond that to some sort of next generation capability for the homeland, look, we're going to have to accept some risk. Why do we have to accept some risk? Because a programmatic failure over the past several years, a change of direction over the past several years, and, frankly, a diplomatic effort over the past several years that lost time, that got misdirected. I think it allowed the North Koreans to bamboozle us.

And so, yes, we are going to have to accept a greater risk from North Korea in the coming decade, and we're going to have to accept risk on our missile defense posture. I'm not saying this because I think it's great, I think it's reality; that the loss of time and the loss of effort over the past several years is going to mean we're going to have to do what we can to have a limited homeland missile defense enterprise that's reliable and capable, more so than today, but also take a step back and make sure that we're doing something to get to that next generation capability.

MR. ROSE: Great. Laura, Arch, anything to add on that point?

MS. GREGO: Well, I — you know, I would expect the North Korean threat to evolve modestly, you know, subject to their economic constraints. And I would, of course, encourage a whole of government approach to slowing that down and limiting that and walking that back. And I think, you know, to me it's likely that almost whatever missile defense capability we field, it's deterrent effect will be much smaller than sort of the threat of retaliation. And I'm not sure that chasing that down is going to essentially change the calculus. I don't think we'll ever build something good enough and test it well enough that we would be confident that it would change the game.

So I don't think that that's where we should put our —— we shouldn't put our should eggs in that basket.

MR. ROSE: Arch?

ADMIRAL MACY: I take a slightly different view. I believe that I think with Tom that, you know, the limited missile defense, whatever that means, but the ability to negate a North Korean successful attack on the United States or on principal interests of the United States, including allies, is important. So that the North Koreans understand they're not going to succeed because coupled with that will be the assurance that we will respond, that the point in the end —— the fundamental point of any air defense system is to protect your critical assets long enough to end the threat by other means. And this is back to the integration of offensive capabilities, the offense-defense integration that many people talked about. CSIS put out their major paper last year on that. And so the point here is to not defend against North Korean arsenal, it's to make clear against the North Koreans that about the time the third missile leaves the rails, there's going to be so much incoming that it's going to have been a really bad idea to push the button three times. And it's incumbent on us to do our best to make sure that the first three that did get off have little to no effect.

So to me that's the focus. It is a limited response sufficient to enable a massive counter that will prevent the threat from continuing.

Over.

MR. ROSE: Great. Thanks so much, Arch.

We've gotten quite a few questions on hypersonic weapons. Indeed, I know, Laura, several of your colleagues at Union of Concerned Scientists wrote a recent report on this subject. What I'd be interested in hearing from the three of you is, one, how concerned are you about hypersonic weapons? And do you think that these new weapons could fundamentally alter the strategic balance between the U.S., Russia, and China, as some experts have claimed?

Who would like to start?

Laura?

MS. GREGO: I can make a comment there.

Thanks for referencing the report by my colleagues, Cameron Tracey and David Wright.

It was published in Science and Global Security Journal. And they were looking at the long range threat, so really not focused on regional threats in this context. But in that sense I think that trying to look at what the hype about hypersonic missiles are versus what advantages they might bring you. And I think their assessment was probably evolutionary rather than revolutionary. They're not faster than ballistic missiles on these long ranges and they are not invisible. They're certainly visible to existing infrared space based sensors through almost all of their trajectory, but they do maneuver. And if the idea is to maneuver around missile defenses, as we just established, Chinese and Russian ICBMs could easily defeat U.S. ground based missiles defenses anyway. So that doesn't materially change the strategic balance in that sense.

And in some ways, you know, you look at the Russian Avangard hypersonic glide vehicle, which would be launched from an ICBM and then do its maneuvering, it's been mounted on — I believe it's been mounted on the Sarmat launcher, which can reportedly carry 10 MIRV warheads. So, you know, it's not such a bad deal to have one hypersonic glide vehicle versus 10 income warheads. So in that sense, you know, that may be a good thing.

So there is certainly a question — and I know we had some discussions about this in our prep call — about defenses in the sensing layer for hypersonics. You know, as far as I can tell from what we know about the ballistic missile warning sensors, the SBIRS and the SBIRS highly elliptical orbits, they should be able to see these missiles as they come in, at least until ground based radars can pick them up. So we'll know where they're coming from, we'll know generally where they're headed, and we'll know quite a bit about them with existing infrastructure.

MR. ROSE: Arch? Tom?

ADMIRAL MACY: My view on that is we still have a lot to learn about how to deal with hypersonic threats, both to employ them and to defend against them. My background is in aeronautics and aerospace engineering and one of the things you learn is that every flight vehicle, when it brings a new capability it also brings new vulnerabilities. That flight is a very complex environment. Flight on the edges of space is even more complex. The fast you go, the higher you maneuver, the more complex again it becomes. And this makes it hard to defend against in the sense that it's harder for a classic straight line of sight point to point interceptor to deal with. But it also offers opportunities to both detect

and to engage.

And I think that there is a lot left to be done on learning particularly the latter part. The detection part I've never really seen as a problem. The points that were brought out in the paper that Laura's compatriots put out were very good from a technical point of view. I think they overly focused on the long range threat rather than the medium range threat. Hopefully they'll put out a subsequent update to address that or the short range threat.

But the point about what happens to these, the other thing is stability and control. Vehicles flying at those speeds are on a very thin edge of being stable and if disturbed a very little bit tend to come spectacularly apart in flight.

So I think there's a lot still left to be learned about this. So there are advantages to hypersonics over ballistics, there's advantages to ballistics over hypersonics. This is a new threat, we need to learn about it, but it is not, despite what President Putin and some other have declared, the invincible threat. We'll get it.

Over.

MR. ROSE: Tom?

MR. KARAKO: Yeah, no, that's well put. And that aspect of the hypersonic discussion, the popular discussion, that's legitimate hype. These are no invincible weapons for some of the reasons that was just said.

You know, part of this I think depends upon whether we think about "hypersonic weapons" — although I prefer to refer to them as what they are rather than what is after all a pretty big band of their speed, so think about gliders or scram jets — whether gliders or scram jets are a substitute for an ICBM kind of thing, or whether it's a better cruise missile, right, whether it's a better way to TAC (phonetic) or anti-ship cruise missile. I agree with Laura, the Avanguard, right, in many respects that's not a game changer, right, because right now we're not really trying to do the Russian ICBM defense. But the converse of that I think is also true, that in terms of a complex and integrated attack on — sort of a really well structured attack on our forward bases and forward forces, for that kind of thing hypersonic gliders or scram jets do give you a lot of advantages. It allows you to construct a really complex and wicked kind of attack.

And so we have to be careful there. And Arch pointed to the difference between the shorter and medium range stuff as opposed to the ICBM stuff. You know, one of the aspects of that paper that I really liked was that it pointed out that, look, hypersonic defense is not impossible. I've been saying for some time this is complex air defense. Among other things, the nice thing about hypersonic flight is it strips out counter measures, which for so long has been the bane of BMD, which is mid-course discrimination. So that's a good thing too. This is complex air defense.

But I'll just say one thing, and that's about the space sensors. And if I'm not mistaken — I have questions on this — but one of those papers conclusions was about existing sensors being able to provide early warning for these things. It does run up a little bit against some of the many public statements by a number of officials about the need for space sensors for tracking. So, you know, with this sort of things it depends on what questions you're asking. Is it merely early warning that you're trying to get after, or is it more precise tracking? My sense is that it's something like the HBTSS constellation, if that's still going to be useful for this kind of threat, whether it be short range or long range.

MR. ROSE: Thanks so much, Tom.

Well, one of the really interesting questions we've received is about the use of drones by the Iranians and the Azeris in recent attacks. In 2019 the Iranians used drones to attack facilities in Saudi Arabia, and in the recent war in Nagorno-Karabakh, the Azeris used drones very effectively against the Armenian military forces.

Tom, I know that you've looked at this issue pretty closely, from your perspective, what are the lessons for the U.S. military from these two recent events?

MR. KARAKO: Thank you, Frank. That is a great question and it goes to this phrase that I keep repeating this whole hour, and that's complex and integrated attack. And the technical maturity over the past, I would say, 20 years or so of various remotely piloted vehicles, has brought and has ushered in this more rich threat spectrum.

I'll point you to some publications by my colleagues at CSIS, Shaan Shaikh and Wes Rumbaugh, and then Shaan Shaikh and Ian Williams, who did two publications. One on the Armenian Azerbaijan conflict that you just highlighted, and a second on the missile war in Yemen over the past five plus years. And what you see there are two pretty interesting case studies of the richness of this threat

spectrum being employed in imaginative ways, you know, combined arms, right, the mixing and matching of these various things to create this playground for this new type of warfare.

But what we also saw in the Nagorno-Karabakh conflict was the use of these drones against, in particular, Russian made air defenses, right. Now, that's something that we have to think about and that I've been banging a drum on for years now, in terms of the survivability of our air and missile defense elements to complex and integrated aerial attack. And so if in that conflict they can figure out how to go after a Russian made radar, well you better believe that just as the Houthis have been targeting our Patriot radar — and the Iranians released a video a couple of months ago of one of their missiles striking what was made to look like a TPY-2 radar, like that we have in Turkey — that our adversaries are thinking long and hard about how to target and disintegrate our air and missile defenses. And if what the Iranians can do and what these other folks can do, the Russians and Chinese can do, orders of magnitude better. So we better think about the survivability and the resilience of our defenses.

MR. ROSE: Laura, Arch, anything you'd like to add?

ADMIRAL MACY: I completely agree, which is why, if I could, I would prohibit the use of the word missile defense by itself. It's air and missile defense. Or, as Tom has heard me argue, we need to go back to saying it's air defense because the damage that is to be done is all done on the face of this planet. That's where we live. And you've got to go through the atmosphere to get it to. I don't care where you started. But it's got to cover everything from a 50 pound UAV at 70 miles an hour to a ballistic missile and everything in between. And we keep I believe limiting ourselves by saying we're going to have a missile defense review or a BMDR or a counter IADs review, or whatever.

MR. ROSE: Great. Well, we have time for one more question. And this deals with cruise missile defense. And the question is how can the new administration address the cruise missile threat to the U.S. homeland? And, furthermore, will the new missile and air threats to the continental United States require reassessment of the U.S.-Canadian NORAD arrangements?

Who would like to start?

Laura?

MS. GREGO: Well, I don't specialize in cruise missile defense, but I certainly think it has its similarities to hypersonic missile defense in that you'd be defending areas, not the whole homeland.

And in the same way — slightly different — in that you would certainly need a new set of sensors. It's a different system entirely.

I was looking forward to I think that the last Missile Defense Review tasked the Pentagon to come up with a plan. I don't think I've seen that yet, so I couldn't comment on where we're at and what the threat is imagined to be or — I'm sorry, assessed to be.

MR. ROSE: Arch? Tom? Anything you'd like to add?

Tom.

MR. KARAKO: Yeah, you know, I think cruise missile defense is probably the single most important aspect of air and missile defense that we have not been pushing forward on sufficiently. You know, we tend to think about the homeland unfortunately as something that's here and cruise missile threats is something that's over there. But North America is a region too, and as the Russians have telegraphed in their shooting of calibers from hundreds and hundreds of miles away of Syria, that that kind of threat is here now.

And, again, thinking about non-nuclear strategic attack — not nuclear weapons — non nuclear strategic attack that could help coerce the United States or change or political calculus, we need to pay more attention to the cruise missile aspect — cruise and UAV frankly. Just cruise has longer range. So that's absolutely true for the homeland, but you look around, with the exception of perhaps the Capitol region, the Army's efforts for the IFPC, which is essentially their cruise missile defense program, has been kind of stalled. And that's going to need a lot more attention.

I appreciate Laura's highlighting of the sensors. Sensors, sensors, sensors. And in terms of the U.S.-Canadian relationship that you asked about, Frank, I would want to make sure that there's enough sensors up north, that that gets renewed attention.

And then, finally, elevated sensors that can't be — you know, they're hidden by the surface of the earth, they're easier to target, and they can see out and see these things coming so that we can either provide early warning or defense — elevated sensors.

MR. ROSE: Arch, last word to you.

ADMIRAL MACY: Last word on this is everything that they said, it's sensors, it's capability. We don't have it for the homeland. NORAD started as an air defense organization against

Soviet bombers long before ballistic missiles were an issue. So the structure exists, the command and control systems exist, the policies exist. What doesn't exist is the tools that NORAD needs to defend the U.S. and Canada from air attack. Those have become moribund and abandoned in the last 25 years.

MR. ROSE: Great. Thank you, Arch.

Well, we are at the end of our allotted time. Let me thank Laura, Arch, and Tom for participating in today's panel and for a really great discussion examining the real challenges that we face in addressing this evolving air and missile defense threat.

Let me also thank the audience for joining us this afternoon. Have a good day and stay safe.

Thank you very much.

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