

012319 Missile Defense Advocacy Alliance (MDAA) Capitol Hill Forum on “The Missile Defense Review: Expanding the Mission of Missile Defense” with Undersecretary of Defense for Policy John Rood; Ballistic Missile Agency Director Lieutenant General Samuel Greaves; and Riki Ellison, Founder and Chairman of MDAA

MR. RIKI ELLISON: Welcome, everybody, to “The Missile Defense Review: Expanding the Mission of Missile Defense.” This is our 21st Congressional Roundtable. I’ll take a couple of minutes just to introduce the organization that’s hosting it, MDAA, and myself.

I’m Riki Ellison, I’m the Founder and Chairman of the Missile Defense Advocacy Alliance, founded in 2002 with the single purpose to advocate and educate on the deployment and development of missile defense to make our nation and the world safer. I’ve been active in the advocacy of missile defense and this mission for over 38 years, with my beginnings at the University of Southern California in 1980, where I was introduced to the national security adviser to Governor Ronald Reagan during his presidential campaign with the idea and concept of defeating nuclear ICBMs and making our world and nation a safer place. Today our world and our nation is safer because of this idea that has been made into reality.

In the graduate strategic and defense studies program, I had the honor of being classmates with and being taught by the chief architects of this MDR, Dr. Keith Payne and Dr. Rod Soofer. After being inspired by the 1983 presidential SDI speech and graduation at USC, I was drafted into the NFL by the San Francisco 49ers in the spring of 1983. I continued in my off seasons to pursue my passion for missile defense. I was hired by Julian Davidson from Huntsville, Alabama, the father of the missile defense program, who worked with Dr. Von Braun on our nation’s early missile programs, who worked on the ERIS Program, the Exo-atmospheric Re-entry Interceptor Program, the second generation interceptor, throughout my 10 years of playing in the NFL and being part of three super-bowl championship teams as a linebacker.

After I retired, I worked on the initial lead systems integrator for homeland missile defense system in the 1990s, working closely with Republican Senator Ted Stevens of Alaska, and Democratic Senator Dan Inouye of Hawaii, to move the GMD system from South Dakota to Alaska as to protect all 50 states. Since the founding of MDAA in 2002, we have built two missile defense observation memorials, one at PR-MEP (ph) in Hawaii at our testing range, with Democratic Senator Daniel Inouye; and one at Vandenberg Air Force Base, where we have four GBIs located, with Mrs. Nancy Reagan.

We have visited 520 missile defense sites and bases, both U.S. and allied. We have seen 241 missile defense tests. We have advocated in 27 countries, and most of all we have recognized military operational excellence in leadership across the military services around the world in missile defense.

There are 600 Defender of the Year recipients representing 17 allied countries, hosted in seven different countries. We have advocated for missile defense through six United States' presidents and their administrations. They're like quarterbacks.

They have different styles of play. You play for each one of them to help them win. As great defenders do, we give them the ball as many times as we can, where they score touchdowns, throw interceptions, get sacked or fumble. No call or (backup ?).

Over those 38 years there have only been four major presidential initiatives announced and led by U.S. presidents. The first one by President Reagan was the idea, on March 23, 1983, who set the vision and concept, the Strategic Defense Initiative. The second one by President George W. Bush for the first deployment of limited missile defenses to include the GBIs for the defense of the United States homeland in Alaska on December 16, 2002, for a limited system against North Korea.

The third one, President Barack Obama for the deployment of the European Phased Adaptive Approach, a limited missile defense system, for Europe using Aegis Navy ship and land BMD capability against Iran, on September 17, 2009. The fourth was last Thursday by President Donald Trump for the expansion of the limited deployed missile defense system to, in his word, quote, "Our goal is simple, to ensure that we can detect and destroy any missile launched against the United States anywhere, at any time, in any place."

With that presidential statement the 2019 MDR was released. The Missile Defense Review expands the limited missile defense mission of the previous two administrations with more capability, more capacity. It expands the mission to include boost-phase intercepts, space-based discrimination, hypersonic defense, ICBM under-layer, cruise missile defense, offense-defense integration, and allied partnership. A bulk of the expansion is being done from existing deployed systems and platforms. Most of it will be the F-35.

Acting Secretary of Defense Pat Shanahan on Thursday stated, "We are not interested in keeping pace with emerging threats. We want to outpace them. This requires not just defensive weapons, but a host of enabling technologies that will allow us to integrate the missile defense mission across our departments."

With that, I'd like to move to our speakers and presentation. This is an informal session. The undersecretary and director will be making opening statements on the MDR, and we'll be taking questions after those statements are done from the audience.

We have the honor today to have the Undersecretary of Defense for Policy, who a year ago came into office. His first major decision was to change the missile defense missile review into the MDR,. He received Secretary of Defense Jim Mattis' permission to do that, and what you see today is his oversight of the release of the Missile Defense Review.

John is a graduate of ASU. He has very strong governance experience. In the early days of 2000, when we pulled out of the ABM Treaty, he was the director of proliferation strategy, counter proliferation and homeland defense on the National Security Council, from 2001 to 2003.

He was the deputy assistant secretary of Defense for forces policy, from 2003 to February of 2005. He was the special assistant to the president and senior director for counter proliferation strategy on the National Security Council, from February of '05 to October '06. He was the assistant secretary of State for international security and nonproliferation, from October 6 to September 7. He was the acting secretary for the Department of State for arms control and international security from September 2007 to 2009. He is well qualified to talk on this issue specifically.

Ladies and gentlemen, the honorable Undersecretary John Rood.

(Applause).

SEC. JOHN ROOD: Thank you, Riki, for that very nice introduction and the scene setting. I was sitting here, though, thinking about some of the experiences I had in this room prior to some of the jobs that Riki mentioned. I came to the Congress to work as a fellow for first Senator Kyl and then later Senator Cochran, in 1996. I was trying to think when I was first in this room, and I think it was in 1996. If my memory is right, the earliest times I came here were to talk about missile defense and to participate in events that either Senator Kyl or Senator Cochran or others were participating in.

By the way, it looks about the same. I think the art work might be the same from 23 years ago. But it's great to be here, and I see so many people who participated in those days.

This Missile Defense review that we're going to talk about really does usher in the next era for missile defense, and missile defense specifically, as Riki mentioned, not just ballistic missile defense but defense against hypersonic missiles and defense against cruise missiles. We're entering that new era, and it's a big change from when I last sat in this room in the '90s when the big debate in this building -- if you would have gone down a few floors in the various offices -- was about, is missile defense something the United States should pursue at all, or are there alternative arrangements either through arms control or diplomacy or what have you?

I remember 20 years ago, in 1999 the big debate on the floor of the Senate -- which led to a filibuster and first no resolution, and then later a vote to invoke closure to proceed -- was a one sentence bill that Senator Cochran was the lead sponsor of. And there are some people like Mitch Coogler (ph) who are here who wrote that, that describes just the simple statement that it will be the policy of the United States to defend itself against a limited ballistic missile attack. At first the Senate had about 30 hours of debate and was unable to resolve that it should vote on that question. Later, upon a reformulation, it decided that it should, in fact, vote, and established that as the policy of

the United States. But that was a very cutting edge debate in this room, in this building, 20 years ago.

Now look at where we are today. If you look at what President Trump announced at the Pentagon last week, we have come a long way, to no longer saying that we want to pursue just the initial phases of a missile defense for the United States, but one that will outpace the threat, that will protect the United States, our deployed forces, and our friends and allies. Again, not just from limited ballistic missile strikes, but against missile attack from all sources and different varieties of missiles.

We started this work on the Missile Defense Review well over a year ago in the department, and it was President Trump who instructed us to do that, but it was also the Congress that required it in law. So we set about having a major review. It's the first one that was done in eight years, since the Obama administration in 2010, a Missile Defense Review was released, then called the Ballistic Missile Defense Review.

The resulting Missile Defense Review that we've produced is very aligned with the National Security Strategy that President Trump unveiled about a year ago, and the National Defense Strategy that then-Secretary Mattis unveiled for the Defense Department. Those remain our guiding documents. They remain the North Star, if you will, against which we do all of our defense planning.

To a degree that I have not observed in my 30 year government and industry career, I've not seen us implement a defense strategy to the extent that we are in the Defense Department. Our Acting Secretary, Pat Shanahan, really drives that effort, and the Missile Defense Review is fully consistent with that broader effort.

The 2018 National Defense Strategy emphasized the fact that we've entered an era where the international security environment is characterized by the re-emergence of competition amongst the great powers, to an extent in complexity and scale of threat that we've not observed in my lifetime. Part of that is the growth of these ballistic missile and hypersonic vehicle and cruise missile threats that we face.

Today over 20 states possess offensive missiles, and the ongoing proliferation of these capabilities, both in proliferation as in capability, proliferation as in the size of the arsenal, proliferation also in terms of the integration of those capabilities with other military capabilities those countries possess, is what really concerns us. Over the past decade, for example, North Korea in addition to a vigorous nuclear testing program, has had a very active ballistic missile program. And while we have a very live and active set of diplomatic actions to include meetings by the president of the United States -- one that's down and another to come with the leader of North Korea that gives us new hope for a different avenue -- we still look at North Korea's capabilities, their ballistic missile capabilities, their nuclear capabilities, and we plan for those, because those do present those capabilities, a threat, to the United States and our allies, and it's a very substantial one that we have seen North Korea develop.

Iran is another concern. They are extending the range of their ballistic missile systems, and they have the desire to have an ICBM long-range intercontinental range ballistic missile that can reach the United States, as an aspiration. So we are, as part of our planning in the Missile Defense Review, take that threat fully into account, as well as the extensive missile arsenal, which is the largest in the Middle East, that Iran has developed, where we need to have the force structure and the ability to defend against that very real and growing threat.

Furthermore, other potential adversaries, revisionist great powers in particular, are expanding and modernizing the full range of offensive capabilities. For instance, both Russia and China are testing hypersonic capabilities, that is to say those systems that fly at greater than Mach 5.

State and non-state actors are routinely using these weapons in conflicts. If you have been following the Syria conflict carefully, for example, dozens of missiles launched in that conflict, something that led NATO to deploy ballistic missile capabilities to Turkey to protect that NATO ally from missile attack. We've also seen, if you're following the conflict in Yemen, non-state actors like the Houthis using ballistic missiles, as well as cruise -- what you would consider cruise missiles, but really unmanned aerial vehicles, to substantial effect.

They are aided, of course, by Iranian capabilities. While the Houthi missile engineering capabilities are known throughout the world, they've gotten a little help to have those systems in their arsenal. So we monitor that very carefully as well.

If left unaddressed, these expanding offensive missile capabilities could embolden some of these non-state as well as state actors to take steps where they think they can coerce the United States or our allies, that they could inhibit our freedom of movement, or indeed maybe hold at-risk some of our capabilities, whether that be our cities or our military capabilities. And despite the frequent criticisms we hear from countries like Russia and China that the United States is pursuing defensive capabilities, indeed they are funding and developing and putting in place their own missile defense capabilities.

That is one of the things I would commend you to look at in the Missile Defense Review. There is a treatment of that that is given in those pages. Russia maintains and is modernizing its long-standing missile defense system around Moscow, which includes 68 nuclear-armed interceptors, and they've fielded a variety of shorter range missile defense systems throughout Russia, and outside Russia's territory.

So it is against this backdrop that the Missile Defense Review -- that threat environment -- sets in place the goals of our defense capabilities and the tenets of that strategy. They are, one, to strengthen the ability to deter attack against the U.S. homeland, U.S. forces abroad or our allies. If deterrence does not work, obviously to provide an active missile defense capability that can deal with those threats. Third, to assure our allies and partners that we have the ability to conduct military operations so that we have the ability to meet our defense commitments to them.

We want to provide a position of strength in favor of U.S. diplomacy. I think you see that playing out in the North Korea context right now. We have both a missile defense capability that can deter and if necessary defeat a North Korean attack, but we're also pursuing diplomacy. Having that missile defense capability provides time, provides space, provides other options that are stabilizing to that situation and others.

And then lastly, it helps us hedge against unanticipated threats that can emerge, and there are times and there will be times in the future, when we in the United States are surprised. So the Missile Defense Review sets out some key policy priorities that shape this whole government apparatus that we have to address this, and there are quite literally thousands of people in the United States government whose activities -- or our contractors -- who are guided by these activities, the Missile Defense Review. And so it sets as the objective to develop and field active missile defenses for the U.S. homeland to stay ahead of the projected missile threats from both North Korea and Iran. This U.S. homeland defense capability will be prioritized above others and will provide a continuing homeland protection that as that threat emerges, as it becomes more sophisticated, that we will keep pace and indeed seek to stay ahead of those capabilities.

We're going to continue to emphasize the complementary role that nuclear deterrence plays. For example, the arsenals that Russia and China have are very large and very sophisticated, and we rely on nuclear deterrence to deal with those capabilities. We're going to tailor our regional missile defenses to different adversaries and scenarios, and have different concepts that can prove disruptive.

General Greaves from the Missile Defense Agency is going to talk about some of the specific enhancements that we have laid out in the Missile Defense Review, but in summarizing I guess I would say we're going to continue with today's generations of technology to field greater numbers of those capabilities and have evolutionary improvements. But we're also going to pursue a new generation of technologies that is substantially more capable, and that is intended to stay ahead of the emerging threats that we see from rogue states, but also to deal with some of these newer threats like hypersonic missiles that we have to be prepared to deal with.

We're going to do this, and this is discussed at some length in the Missile Defense Review, with friends and allies. I'm very pleased to say we've had terrific partnerships with friends and allies around the world. For example, in Asia we've enjoyed a very strong robust partnership with the government of Japan, in every way that you can just about think of in the missile defense area: from concept development, research, and then the development of capabilities like the Standard Missile III Block 2A that's going to form a large part of our defense as well as Japan's defense.

We have based capabilities like radar systems in Japan that are necessary not only for the protection of U.S. forces in Japan, and can contribute to Japan's defense, but also the protection of the United States. We're talking about expanding that cooperation potentially in the future. You see in other places of the world, in the Middle East -- and

General Greaves can talk more about this -- with countries like Israel or Saudi Arabia, Qatar, the UAE, we've had very strong relationships.

In Europe, NATO as a collective, as an alliance, has made a decision to pursue missile defense capabilities to protect the territory of its alliance members, the cities of its people, as well as the deployed forces. There are organized program offices in the various organs of NATO that are devoted to making that happen. We in the United States continue to deploy missile defense sites both in Poland and in Romania to provide a defense there with Aegis Ashore. I could go on and on, but in the Missile Defense Review you'll see laid out not only the expansion of U.S. forces which will be funded in our coming budget, but also those of allies.

I'll just close by saying defenses are a critical component of any deterrent effort, but the offensive capabilities are also part of it, the sword and the shield, if you will. The tight integration of our attack operations or ability to apply offensive forces and these defensive forces, is another major shift in the Missile Defense Review that I would call to your attention. Driving that close integration, driving that ability to not only deter attack, defeat missiles that are launched at the United States, and indeed if it's a large enough fight, the ability to continue the counterforce activities that will be necessary to provide for U.S. security and that of our friends and allies.

That's probably a good place to handoff, Riki, but thank you so much for convening this group and giving us the chance to talk today.

MR. ELLISON: Thank you, John. I have the great honor of introducing the director of the Missile Defense Agency. Lieutenant General Greaves is as rich in experience as John is in counter proliferation and arms control.

Lieutenant General Greaves was the commander of the 45th Launch Group out of Cape Canaveral, from June '04 to August '06. He was the commander of Launch and Range Systems Wing in Los Angeles, California, from 2006 to 2008. He was the commander of military satellite communications System Wing, Los Angeles, from 2008 to 2009.

He was the vice commander of Space and Missile Systems, LA, from August 2009 to '11. He was then assigned to the deputy director position at the Missile Defense Agency under Vice Admiral James Syring in 2014. And then he was the commander of Space and Missile Defense Systems Center, Air Force Space Command, in Los Angeles, from '14 to '16.

What the general has done great, from our perspective, is he has shifted the culture at MDA where the focus was getting the GMD system the best you could possibly do, and implement the EPAA, and he put it in the best position to implement the Missile Defense Review. A couple of things that have been outstanding is the space-based kill assessment constellation that he has put up with multiple satellites that really is the proof and foundation of moving forward to space discrimination by leveraging commercial

satellites and doing it cheaper and much faster than anybody has done this. He also is championing the cross-domain, C2BMC, for our SM-3 Block IIA, and applied that with a variety of sensors from across all domains, and had a tremendously successful test last month.

He's a champion of the F-35, of bringing that into the fold of missile defense. So it's a great pleasure and a great honor to introduce Lieutenant General Greaves. Sam, it's all yours.

GEN. SAMUEL GREAVES: Thanks for that kind introduction. I hope you all can hear me in the back.

(Applause).

Secretary Rood, I appreciate being here with you today to talk about the Missile Defense Review and what it means from where I sit as the director of the Missile Defense Agency. I will tell you, it was a great pleasure to have been a part of the Missile Defense Review's development under Secretary Rood. Most of what I'm going to talk about today -- and if you've been paying some attention to what we've been doing within the agency over the past two years -- you should see some synchronization between what's in that review and what we've been discussing as our current capability and our requested way ahead, both within the administration and with the Congress.

Let me start off with the current mission of the agency, which is to develop and deploy a layered missile defense system -- and layered is going to become very important as I continue with my talk, as Secretary Rood said -- to defend the United States, our deployed forces, our friends and allies, against missile threats. As the president said, he expanded that mission to missile attacks of all ranges and in all phases of flight.

The current system that we've got today is extremely capable and is globally deployed, and I'll talk a little bit more about what that means. The system is an integrated system. It's a layered system that's globally deployed and is composed of sensors which are Earth-based and space-based today, and sea-based in some cases. It is tied together with a command and control battle management system, if you will, something akin to what you may have heard as multi-domain command and control system.

And then it's tying those sensors together with shooters of all types on land and at sea. At sea it's primarily the Aegis weapons system. On land, depending on the range of the threat that these systems have to mitigate, it's everything from Patriot to THAAD to SM-3 and our Ground Based Midcourse Defense. So it's a layered, integrated, globally deployed system that is very capable, deployed today, defending our way of life and defending our deployed forces, our allies and our friends.

Let me turn to the priorities of the agency. As Secretary Rood said, those priorities are completely in line with the National Defense Strategy. What I'll be talking

about is a strategy-to-task perspective, get the policy direction from the top, and we develop the capabilities to execute that policy direction.

The top priority within the agency is to ensure we maintain a focus on sustaining the systems that we have deployed in the field and increasing the reliability of those systems. That's extremely important because the combatant commanders today must have confidence that those systems will work when they're tasked. So that remains the top priority of the agency, to ensure the systems we've got deployed maintain the confidence of those decision-makers in their usage.

The second priority is to increase the engagement capability and capacity of those systems, as in making them do more with what we have today. The third priority, and it's not one versus the other, but in this high threat environment is to rapidly address the advance threat, and I'll be talking a lot more about that in a few minutes here.

The Missile Defense Review, as we assessed it, is really a comprehensive approach to protect against adversary attacks through three main pillars, the first being deterrence, the second being active and passive missile defense, and then in cases where deterrence fails and conflict ensues, implementing attack operations to destroy regional offensive missiles and infrastructures. So it's a three legged stool, very comprehensive and very thorough. It brings attention, in our opinion, and reinforces the Missile Defense Agency's efforts to develop and deployed the layered missile defense systems I referenced earlier.

Our focus within the agency is completely in line with the national policy, as well as what's in the Missile Defense Review. For us, most importantly, the Missile Defense Review provides guidance. It provides focus, it provides synchronization within the Department of Defense, which then allows us to execute the acquisition mission that we've been assigned. What that really means is that by having that top level policy guidance we are then able to set our vision, set our priorities, help develop the budgets, and focus the agency to deliver against what's been directed in that policy. So that is our hope and that is our intent.

Now for some specifics. Before I mention the specifics, the agency's perspective is to execute the acquisition mission in a disciplined manner, in a milestone driven and gaited approach, data rich, test proven, and deliver in increments. The example is this. The current EKV, the current kill vehicle, is part of the Ground Based Midcourse Defense System. That was developed in a very different timeframe where the nation had no capability at all and the thrust was to deliver the best we could as fast as we could do it and get it into the field to defend the nation. That system has been improved over the years and remains a very capable test proven system, with a successful ICBM target intercept from a year and a half ago.

Today what we are charged to do is to improve on that system by delivering a reliable kill vehicle, an RKV system, which will be more testable, more maintainable, more produce-able, at lower cost and at least as equal, but will likely be more capable

than the systems that we've got in place today. So the difference, again, is that then drives us and allows us to use a very disciplined acquisition approach to deliver that capability. We will under-promise and over-deliver. That's something I say as many times as I can say it.

We will not promise the sky. We will deliver on our promises to the schedules that we've laid out and we will make acquisition decisions as laid out in the acquisition strategy approved by the Department of Defense. That is really important as we talk about requests for budget and execution of dollars and what we'll ask industry to do and what the priorities are.

But if you take a look at the three priorities I laid out for the agency, the first being to increase system reliability and to build that warfighter confidence, some of the things that we're doing -- the number one thing is sustaining the ballistic missile defense system, ensuring that the system will work when it's asked to work, maintaining the Ground Based Midcourse Defense, GBI, ground-based interceptors that we've got deployed today while improving their reliability and their lethality. I mentioned briefly the reliable kill vehicle development to improve on the overall capability of the ballistic missile defense system as well as not only the kill vehicle, but upgrading the boosters that fly the kill vehicle into the box to mitigate the threat.

Cyber security is another area that we're paying attention to. Make no doubt about it, the system that we've got today is secure. We've got a very robust cyber security program and the system is very secure. I am not concerned about the cyber security with our systems that we've got today, but there's always room for improvement. The threat -- as you well know in your personal lives -- the threat is evolving if not daily, by the hour and by the minute, and we've got a robust cyber security program to deal with that.

The second priority, as I mentioned, is increasing our engagement capability and capacity, such things as adding 29 Ground Based Interceptors to the missile field up at Fort Greeley, things that have already been approved by the budget directed by the Congress that we're executing right now. The initial fielding of a long-range discriminating radar up in Alaska, that project is well on the way. It's on-schedule and on-budget. A homeland defense radar for the increased defense of Hawaii, that project is also underway, directed by the Congress and requested by the department.

Secretary Rood mentioned Aegis Ashore Poland as part of the European Phased Adaptive Approach, phase three. That project is underway with expected operational capability next year in 2020. Assisting allies in procuring missile defense capability through our foreign military sales program is also a significant emphasis within the agency, whether it be Japan, Qatar, Saudi Arabia or some of the other countries that we're dealing with who are interested in upgrading their missile defense capability. We're working very closely with them on it.

The SM-3 Block 2A procurement, the co-development effort that we have with

Japan. It was mentioned, the successful test that we had last month to demonstrate that capability. I hope that we would take a look at that test as a good example of what I mean when I discuss and talk about disciplined acquisition.

If you go back to January of last year, that program did not achieve all of its objectives in a flight test. I did not classify that as a failure. I classified that as in a development program we did not achieve all of our objectives. We learned quite a bit on that mission, to include demonstrating what we call engage on remote, essentially passing engagement quality data to intercept the missile outside the range of the organic radar it's attached to. It's a very, very important capability.

So the incident happened. We went through a very disciplined failure review board to identify the root cause. It was identified, tested and replaced, and we've now conducted two successful flight tests where that replacement part was exercised very successfully.

So we're not rushing to failure. We're not afraid of failure. We don't want to fail, but we learn from every one of those experiences. It was mentioned at the direction of the Hill that we were planning to test the capabilities of the SM-3 2A as a potential ICBM under-layer capability, and to do that next year.

The third priority is the real task of addressing the advanced threat. It's everything from what we're seeing, what you're seeing in the open press, with respect to the competition and demonstrations of hypersonic capabilities, as an example, greater than Mach 5, flying lower, right above the atmosphere or right in the top of the atmosphere, and maneuvering. Those are all new and different sorts of threats that we've been tasked to work within the department to deal with.

We're also working with such agencies as DARPA and the Air Force on something called a space sensor layer. That is absolutely key to our ability to find, fix, track and interdict such targets as maneuvering systems like the hypersonic glide vehicles. Unlike what we call a ballistic target -- if I sat here and threw a baseball to the end of the room, without breaking that window, it would fly on a path, a predictable parabolic path, and land in the direction I throw it.

But with moving threats and other hypersonic threats we need birth-to-death tracking of that threat from the time it is launched through its maneuvers so that we can pass the information needed by the interceptor or some other missile defense capability to interdict that target. And you need to do that from birth-to-death, as we call it. What we're finding is that we will need to do that from the high vantage point of space in correlation with the ground assets that we've got. So that's an activity we're working on.

Directed energy is another area that we're spending quite a bit of time and focus, to do such things -- everything from communication to targeting to tracking to interdiction of targets, primarily in the boost phase where they're very highly vulnerable. The last thing I mentioned, of the number of things that we're working on to address the

advanced threat, is kill assessment. It is absolutely important for the combatant commanders to know whether or not an interceptor or some intercept capability has done its job, to marshal and husband and optimize the use of the resources that we've got. So if we can tell the combatant commander and the ops crews that yes, we have destroyed that target, and do it in a combat relevant time period, it expands the flexibility that the combatant commander has to use their resources. We have a demonstration program to do exactly that and to do it from space, and it's performing extremely well so far.

As you read through the MDR, and I hope you do read the MDR, it's 81 pages, you'll find that there are 13 taskings to which the Missile Defense Agency is involved with. What you should notice is that there is a significant amount of coordination required within the Department of Defense and outside the Department of Defense for each one of those. They are each on a timeline, months not years, to get to a decision.

It will involve everything from looking at concepts of operations for the NC3 lead that STRATCOM has to deal with the hypersonic glide vehicles, to designating acquisition agents to execute those tasks, to working with the Army on what's the right number of THAAD batteries, looking at the way we within the missile defense community generate requirements and who's involved with that because the requirements lead to architectures which then lead to budgets and then things on contract with industry to deliver capability and to do it in a more optimized way, and trans-regional missile defense integration and everything to include studying the potential for a space-based intercept layer.

So it covers quite a bit of ground. I think it does it in a very disciplined, coordinated manner that's time certain, that's not endless, so that we can get some decisions made. I think that's really important to our seniors. Acting Secretary Shanahan said the other day, as he was introducing the MDR release, we're in the department of get stuff done. That's our perspective within the agency, to take the time upfront to assess and study the issue, but make some decisions and move on with it.

So with that, thank you very much for the opportunity. It is great to be part of what I believe to be a very comprehensive policy document which provided me essentially as the agency director with the top cover to go out and work within the department and outside the department to deliver the capability. Thank you very much.

(Applause).

MR. ELLISON: Thank you, Sam. Thank you for your leadership. General, could you, to start off, the F-35, would you want to make a couple of comments on that and the boost phase and sensor architecture?

GEN. GREAVES: I'll be quite honest, this is how a lot is done within the department. We were having discussions about, what's the next step with missile defense? How can we improve our capability of the overall missile defense system? Not shoot for the moon and have every system do everything. Take a look at where you've

got already deployed resources that may contribute to all the missile defense capability or a portion of it.

I was sitting, sir, next to you and we were talking about this. It was suggested, take a look to see what's out there. Don't be constrained with the classic TMD is part of missile defense so we just stop there.

It was pointed out to me that we have assets that will be in any AOR, whether we're doing missile defense or not. What can we do to leverage that capability? We looked around and discussed this, and the F-35 was an obvious choice, because the approach will be crawl-walk-run.

Look at an area, decide whether or not it's worth investing the time, money and effort, test out its capability and incrementally deliver that capability. So we looked at the F-35, an outstanding sensor suite, as well as a potential platform for kinetic weapons. That platform, among others, will be deployed in number in just about any AOR that we're in.

So we looked at it from the perspective of -- and we had lots of help from industry, from other advisory boards -- that yes it is a possibility. So we looked at what can we do to leverage that system? We came up with a construct and we've now had it participate in two missile defense tests, and there will be more in the future, to assess whether or not we can take full advantage of both the sensor capability as well as the delivery of an interceptor capability from that platform, or whether it's limited to just a sensor or interceptor delivery.

The important thing is that we're not sitting still, we are actually assessing it. It's got great potential to fulfill a portion of the missile defense mission. Depending on what we get back from these tests, we will then work within the department to deliver the architecture, if it's deemed feasible, as well as the budget requests that may be involved. But I've got great confidence that that system could be a significant contributor to our missile defense capability.

MR. ELLISON: Thank you. We're going to open it up for questions. If you would, state your name and your organization. Who would like to go first?

Maria?

MS. : (Off mic) -- in FY '19 are those key advanced technologies -- see the funding applied in MDA, specifically a space sensor layer and directed energy? When Congress passed those back in '19 in anticipation of the MDR, do you see that move in a formulation process? (Off mic) -- that shift for the next coming year?

SEC. ROOD: Well, Maria, as you pointed out, the Congress has been very supportive of the exploration of new technologies, and indeed in the space area directed us to do some examination of how we can practically do that in the Defense Department.

Of course, we've followed up on that. You see a lot of that expressed in the Missile Defense Review because again, the guiding philosophy in the MDR is that given the evolution of the threat: more sophisticated, larger scale and more integrated with the adversary capabilities; we also have to have a more integrated and capable response.

In that defense, today's technologies will be continued, by and large, which is expensive. There is a requirement, what does it take to field all that force structure? What does it take to sustain it and to keep it vibrant? So that is going to be continued.

But as we incrementally improve those capabilities, there are new things that we would like to do. As you know, in the S&T development realm the beginning phases of exploration of that, the amount of funding as compared to as it ramps up and continues, grows. So you'll see that expressed in our coming budget submission. Obviously we're not at the stage yet to publicly release that, but some of the things to look for in these advance technologies: directed energy, certainly what General Greaves spoke about with respect to boost phase defenses and integration of these assets, and then we're looking at space to a substantial degree.

In addition to the Missile Defense Agency's work in space and the description of it in the Ballistic Missile Review, tied to that also is the president's vision for a Space Force as a sixth branch of the United States military. You'll see us come forward with a proposal to the Congress to create a Space Force and a Space Development Agency. One of the interesting thing about space capabilities -- and General Greaves with his background knows more in his pinky than I do in my whole body -- is the importance of the speed of development. This is obviously not manpower intensive, this is an equipment and technology intensive domain. So the capability that you have as a space force is heavily dependent on how quickly and cost-effectively you can put capabilities in space.

General Greaves, did you want to add anything to that?

GEN. GREAVES: No, I think you got the right answer, sir. Let me just say one thing. Hopefully you'll notice that what's in the MDR is completely -- or I should say, we were in sync with what's in the MDR. It completely follows along what we've been seeing for the last few years on the space sensor layer, as an example, on the need to have that vantage point to address the threat that we have been seeing is advancing at a very rapid pace. So we will continue. We're in the end-game of the FY '20 budget discussions within the department. As the secretary says, we will see how that turns out.

MR. ELLISON: Jason.

MR. JASON METZ (ph): Jason Metz, Senator Hoeven's office. I wanted to quickly address, if the threat continues to increase, it has paused in some areas, but near-peers like Russia and China continue to develop weapons, as you talked about Mr. Secretary. North Korea and Iran still have sizeable ballistic missile programs, and there's a proliferation risk in all of that. How do you balance the dated, I believe milestone

driven approach, General Greaves, that you talked about, with what the NDS directs, which is delivering capabilities at the speed of relevance?

GEN. GREAVES: Rapid decision-making. If you look at the way the Missile Defense Agency is organized, and the authorities that have been passed on to the agency, where the person in my position is, for pre-production decisions, is the milestone decision authority, is the head of the agency, is the head of the contracting activity, is responsible for the requirements, presents the budget to the Congress, you've got a lot of authority in a single position, which allows rapid decision-making. The issue with acquisition largely has a lot to do with the ability to make decisions in a time saving manner. The number of entities that believe they need to be involved in any specific decision, and the coordination required to get that done, whether it's on the requirements end, whether it's on the budgeting end, whether it's on the acquisition end.

So I really believe that with those authorities and with that decision-making and with the very good relationship we've got within the administration and on the Hill, we can get rapid decisions made to allow industry -- because we're not building anything -- allow industry to have things on contract in a very rapid manner and allow them to move out and deliver capabilities. So I don't see a disconnect there, I see the way we do business within the agency with all the authorities I mentioned, it begins with the identification of the threat all the way through to delivering and sustaining capability on the other end. With that construct in mind, to include the organization, we are well positioned to maintain pace and in most cases keep ahead of the threat, if that helps.

MR. ELLISON: Mike.

MR. : Thank you very much. General, thank you very much for bringing up speed of decision-making. Secretary Rood, in April of 2018 you said that the Missile Defense Review would emerge in May of 2018. In this room on September 4 of 2018 you said that it would be coming to a theater near you very soon. It's now January. I certainly understand that you were put in office in January of last year, but can you please explain, were there substantive changes to the Ballistic Missile Review since May of 2018? If so, how would you characterize them thematically

SEC. ROOD: Well, Mike, thanks for your question. The short summary is, there's always time to get these things right. These lengthy reviews, which encompass many stakeholders within the department, sometimes require additional discussion and additional revision. So the short answer to your question, were there revisions since May, yes there were some revisions since that time as we worked on the document. As you saw the president announce the document, announce the review, make his own statements in there, it's a large government. Certainly it's a lot of people to coordinate and get things around. Sometimes you wish things could be done faster, but I'm really focused on, did we get to the destination that we wanted to get to and are we charting a course for the department, for the United States government, for our friends and allies that makes sense? And the Ballistic Missile Review, I think, does do that.

MR. ELLISON: Patrick.

MR. PATRICK TUCKER: Thanks, Patrick Tucker with Defense One, good to see you again. As I understand it, you're developing a hypersonic capability that is going to be an offensive capability that's for deterrence. You're conducting a study to check the feasibility and the cost of space-based intercept, and that's defensive. You're doing a study to see the feasibility of boost phase intercept from an F-35 platform.

Maneuverable hypersonics, as I understand it, don't have a counter that exists yet. So I'm wondering, as a part of those two studies, the boost phase intercept from space and the boost phase intercept from F-35, are you going to be testing whether or not it's possible to intercept maneuverable hypersonic in the boost phase; or is it for other types of threats?

GEN. GREAVES: Let me start off, boost phase intercept from space, we need to spend quite a bit of time assessing its feasibility and the timelines and cost and architecture that will be required to do that. To cover both requires that integrated, layered architecture I referenced before, beginning with the sensor layer. We've got to have that, whether it's boost phase intercept with some space-based intercept capability. So we're not focused on the interceptor at the expense of the others, we're doing all three.

The F-35 is just one example. It's the first one that we picked to leverage from the deployed capabilities that will be out there that may be available. There are others that we will be looking at, but that's the first one.

As far as the testing, I mentioned crawl-walk-run, so what we will need to do is determine the feasibility, do testing, whether it's in the lab or on the ground -- for instance, the boost phase intercept using kinetic weapons, as an example. We'd have to make sure those interceptor systems are tested from the ranges that we propose using them, before they even get to an F-35. If it's directed energy, we'd have to ensure that we can do everything from maintaining beam control and beam positioning, getting to the appropriate power levels that you need to get to to interdict those targets from the range that we're talking about. Then, working with the combatant commanders, build a concept of operations on the usage of those platforms to execute the mission.

All very doable, but again, not over-promising. We see a pathway there, but it's a very disciplined crawl-walk-run sort of approach to get there. So I know it's tempting to jump to interceptors in space and swarms of F-35s doing the job, but that's not the approach. We see potential in each one of those and every step of the way we'll need department support and administration support and support from the Hill, to get the funds to proceed with it.

And again, it will be data driven, milestone driven, step-by-step. That does not mean long. I'll keep saying it over and over again, if you have the decision-making process, organizational structure and experienced people and authority to get that done, which I believe we do.

MR. TUCKESEC. ROOD: Do you have a sense of the cost of the tests?

GEN. GREAVES: Not in any detail yet. That is part of the process.

MR. ELLISON: Go ahead.

GEN. GREAVES: Let me say one thing, cost estimation is very key because what we need to do is assure when we provide estimates, whether it's to the administration or the public, that those cost estimates are credible. If they've got a high confidence level in them, we understand what the assumptions are, we understand what the additional conditions are, and we don't over-promise and then come back later to say we made a mistake on the cost and it's going to go up, sort of thing. That's going to be crucial.

MR. STEVE TRIMBLE: Steve Trimble with Aviation Week. To follow up a bit on what Pat was asking about, the hypersonic side of this and what came out of the Ballistic Missile Review. I understand the AOA was wrapped up in the first quarter of 2019, the BAA for the concept definition is still ongoing. But do you have any sense yet of what it's going to take on the interceptor level to be able to position the interceptors and what kind of interceptors you would need: kinetic, electronic attack, directed energy, all three, and how would they be arrayed? It seems like a pretty big challenge considering the amount of space that would have to be defended.

SEC. ROOD: I'd say the answer to all of those questions are yes, but I'm not in a position now to publicly discuss that because we're still coordinating the results of that AOA within the building. But I would tell you industry has stepped forward and offered a significant number of options for the department to review and assess. So I will tell you it is a credible option and we need to pursue it, and that's what we're doing.

MS. HAN LI (ph): Han Li, Congressman (Thompson's ?) office, is there any further information on the status of the development of continental U.S. interceptor sites, any further ones, such as those proposed for New York, Michigan or Ohio in previous years?

SEC. ROOD: Further information, let me say this. We have done -- we the agency with the department -- we have done the environmental impact statement, which is the most publicly viewed set of information. We assessed the sites. We know which ones are still candidates.

We are waiting, and whenever the decision is made to move forward with the deployment of a CONUS interceptor site, we will then enter into those endgame discussions with the department to select one. But the hardest part of the work in getting to a decision is behind us. With the help of the Congress we stepped forward and completed that work, and now the wait is on -- the threat driven decision-making process within the department -- for the secretary to say proceed with that.

MR. JUSTIN DOUBLEDAY: Justin Doubleday with Inside Defense. I just wanted to ask about the SM-3 IIA potential capability against ICBMs. For General Greaves, can you kind of paint a picture of how exactly that would work within the current BMD system? And then for Undersecretary Rood, since those interceptors are going into places in the Aegis Ashore sites in Europe, any concerns about how Russia might interpret that move, considering those are supposed to be aimed against Iran?

GEN. GREAVES: At the request of the Congress we've been asked to assess the capability of the SM-3 IIA. Every system is designed against a certain set of requirements. The industry we've got in this nation -- and in this case the co-development with Japan -- they usually deliver systems which perform above the specification requirements that's on the contract. We've been asked by the Congress to assess the capability of the SM-3 IIA performing as what we call an under-layer or an under-lay to the current Ground Based Midcourse Defense System to add robust capability, or to be used in cases where we need ICBM capability for defense. So that's how, as far as we've discussed today, that would be the intent for that.

GEN. GREAVES: With respect to your question about the Aegis Ashore sites in Europe, of course as you know, we've been putting those in place for some time. Actually, that was a decision that President Obama took, to deploy those sites. The capability provided there that General Greaves discussed, is an under-lay. Geography matters a great deal.

The place that those Aegis Ashore sites have been placed relative to the threat from Iran is appropriate. They are optimized to provide that kind of coverage for NATO Europe. But if you're coming from another direction, that is to say a long range missile attack from Russia against the United States, the geography is not properly oriented for that. That's not their purpose, is the reason, why that would be the case.

MR. ELLISON: Thanks, John.

MR. KINGSTON REIF: Kingston Reif with Arms Control Today. I wanted to follow up on the issue of space-based intercepts. Admiral, as you noted, there was a recommendation for a feasibility study on space-based interceptors. The language in the review speaks favorably about the contributions such interceptors might provide to the United States. But your predecessor told the House Armed Services Committee in April of 2016, quote, "I have serious concerns about the technical feasibility of interceptors in space, and I have serious concerns about the long-term affordability of a program like that."

So I was just wondering if you shared any of those concerns? And if Russia or China were to move to put interceptors in space for missile defense, how concerned would you be about that and what steps might you recommend to the Defense secretary to counter that Thank you.

GEN. GREAVES: As far as what Vice Admiral Syring may have stated, that was his assessment. My assessment is that we have to go look at it. I mean, we have to determine whether or not the technology has advanced enough from the mid '80s through the early '90s to what it is today, to deploy a space-based intercept layer. Look at the costs, look at the risks, and make that assessment, which is precisely why I like what's in the report, because it tells us to go do it and get an answer out within six months. So it's not forever that we're going to be doing this.

What was the second part of your question?

MR. REIF: If Russia or China were to move to space-based interceptors how would you feel about that, and what would you recommend the secretary do to counter that?

GEN. GREAVES: We will follow the direction of the secretary of Defense, Undersecretary Rood and the team and the administration on how to approach that. If directed to go do that we would then work with industry to develop the architecture to interdict and defend against that capability. It's not something that can't be done, we need to be committed to doing it.

If that is the direction, then we will do it. There's no -- I can't sit here and say it can't be done. We're very capable within this nation of deploying such a capability if directed to do it. Getting the study done, I think, is a very important part of that.

SEC. ROOD: The only thing I'd add is I think studying it, looking at the efficacy and the effectiveness and what the cost and other considerations would be, is entirely appropriate. Space is an exciting area right now in terms of technology development, in terms of the way that different companies, different actors, are bringing new concepts to space that previously were not seen to be desirable or cost-effective. So this is a pretty exciting area of technology development, and General Greaves is a real expert in that area.

But with respect to your other implication, I guess, of your question, how do we look at space as a general area? One of the areas, whether we like the world to be this way, the reality is that space is very much a contested domain. Countries like Russia and China have not followed the U.S. lead. They have moved forward with military capabilities, and it's the type of thing that this is an increasingly contested area and it's a war fighting domain, just like the air, the land, the sea, the undersea, it is also a war fighting domain that we have to take into consideration. That's why you see the president calling for the creation of a Space Force to be an area that the United States can continue to excel in, continue to have strong capabilities in that area, for the protection of our life here on Earth and the enablement of our military capabilities, but also our economic way of life, our way of life the way we all take for granted that we move information, that we move ideas across the global commons enabled by space capabilities.

MR. ELLISON: Thanks. Andy, do you have a question?

MR. ANDREW BROWN: Hi, Andrew Bronn with Congressman Lamborn. This is for General Greaves. Sir, last year the authorizers both approved the EOQ forward funding for the SM-3 for a multi-year buy, but there seemed to be a snafu with the appropriators not feeling like they were tracking the MDAs enough to go forward with appropriating those funds. Are you all working with our appropriator colleagues now to ensure that we can go forward with a multi-year buy maybe this year?

GEN. GREAVES: Absolutely, we are proposing it and will work with the staffs to explain the rationale, and then of course they get to make the decision. So we'll see how that goes.

MS. MELISSA HERSH: Thanks, this is Melissa Hersh, this is for General Greaves. I wanted to ask you a cyber related question, just for your assurances. Are generators, in your opinion, enough to compensate for local grid disruptions, specifically deliberate cyber attacks to the grid in Poland or Romania. They're supporting fixed radar symptoms. And is there enough redundancy to cover sabotage to those generators?

GEN. GREAVES: That's a very specific question. I'll take that for the record and have to get back to you, but we have looked at the architecture for the generator support for those deployed sites, and believe that they're well protected. But I'll check on that and get back to you. Your name is Melissa?

MS. HERSH: Hersh.

GEN. GREAVES: Hersh, okay.

MR. ELLISON: In the back.

MR. : (Off mic) -- we continue to develop these capabilities that are pretty new in the world. Understanding we're not doing that in a vacuum and other countries don't stand still while we develop reactions to their capabilities, understanding that we're getting better at doing it quicker but still doing it more deliberately, Secretary Rood you mentioned that, to paraphrase, sometimes the best defense is a good offense. How do we sort of -- either at a strategic or policy level -- how do we keep from falling into the trap of an offensive arms race where there's that kind of pressure, as opposed to maintaining this deliberate reaction and forward looking albeit more of a defensive mindset?

GEN. GREAVES: The threat-based approach that we take is we look out across what other countries either have fielded or are in development. That's what drives the consideration, the character and scale of our defensive capabilities. And again, the purpose of missile defense is principally to deter missile attacks, but it's also to provide the ability to defeat that attack should it occur.

But consistent with that, contemporary deterrence is not offense or defense.

Contemporary deterrence is both offensive and defensive capabilities to prevent an adversary from thinking they can conduct an attack. You have to have some credibility to how that will be executed, and as you mentioned, there is a real growth of capabilities.

One of the areas we haven't touched on as strongly as I want is to mention for a minute, having offensive capabilities, having defensive capabilities, is insufficient. The command and control, the way you network these capabilities, is as important as the capabilities themselves. It has been one of the areas that has been a real strength of our in the United States military is to have networked forces.

It's one of the reasons why, with the smallest force since World War II ended, that we are able to do what we can do around the world. So we've got to, I think as a priority, provide the ability to rapidly respond, to integrate offenses and defenses, so that again, missile defenses play a role that is stabilizing. The first time North Korea wanted a crisis, and put a space launched vehicle that we thought could also function as an ICBM on the pad, we brought our missile defense system to alert and it gave us additional options in the United States to allow time for other activities.

And as I mentioned, were pursuing some very exciting diplomacy with the North Koreans. The president is leading for us right now. But in addition to that we have a defensive capability with our missile defense system that allows us to provide time and space for that diplomacy and for other options. But certainly, offenses are always part of a deterrent equation, always part of our -- two sides of the coin, if you will, for how we conduct our military activities.

MS. : This is for General Greaves, with respect to repurposing the Aegis Ashore missile test center in Hawaii, should this move ahead with Navy funds, MDA funds, or both?

GEN. GREAVES: As you know, that's one of the taskings in the Ballistic Missile Review, to assess that capability and what it would take, upon the secretary of Defense direction, to go do that. Today it involves both Navy resources for the operational crews that man that site, as well as funds that come to MDA for resource, development, test production and sustainment. So we will work within the department to understand how that breaks down and how it will be funded.

MS. : Thank you.

MR. BRIAN MUCULLOUGH (ph): Brian McCullough from Lockheed Martin. Thank you very much, gentlemen, for your discussion today and for a great MDR. I'd like to know if there's any kind of plan on how industry can participate in the studies coming up, number one. And number two, specific to general leanings towards either boost glide or terminal -- we spend a lot of time talking about boost phase here for hypersonic defense -- any efforts going forward looking at the other two phases level of effort? Thank you.

GEN. GREAVES: I will say that industry will be front and center, Brian, as far as participating, at least from the Missile Defense Agency's perspective. One of the first tasking I received from then-Undersecretary Shanahan looking at a certain topic, he encouraged me to get inputs from industry, and not from the initial glossy sort of general office sort of responses that you get, but getting responses from the folks who are on the shop floor who understand the real costs of production, the real complexities of production, what it takes to deliver a capability.

I cannot imagine that we would not be expected to engage very aggressively with industry to solicit your ideas, your inputs and your recommendations, so that will be a given, as I hope you see we're doing today in the other areas that we're working on. If you're not seeing that, I need to know about it so I can change it. But I do believe that from our BAAs to our market research, that you are, I hope, actively involved in that.

And yes, boost phase defense, we've got a fairly robust terminal defense. We're working on that. We've got the midcourse part of it, and we're going to be looking to see -- we have ideas, we think we know what the priorities should be with respect to hyper glide vehicle defense, whether you do it in terminal versus glide or some other phase. I'm not going to talk about that much here, but we know where we need to focus. It will be more than just the midcourse or terminal, as we've been focusing on in the past, because the technology, the interest, the capability, the threat all drive us in that direction.

MR. ELLISON: Sam, just one question for you. The MQ-9 unmanned UAVs, I don't know that we've addressed that yet. If you could address how they play and what their future could be in missile defense?

GEN. GREAVES: Testing is a big part of proving capability from the Missile Defense Agency's perspective, and we've been integrating very robustly airborne platforms, unmanned airborne platforms specifically the MQ-9s. Most of our tests you will see, if you look deeply enough, we're on contract with industry to have two of those platforms involved in our tests. As of now they are performing as sensors. There's an IR capability on those sensors, looking and demonstrating the ability to track targets and learn a lot about what that capability can do to help with the command and control battle management system that Secretary Rood has mentioned twice if not three times, to deliver signature capability into that system for decision-making to task interceptors to go in and interdict the target.

The combination of air, ground and space sensors, integrated into a multi-domain command and control system, is extremely powerful to not only optimize and husband your limited resources, but to put the right intercept capability, whether it be kinetic or directed energy or some other capability, cyber, onto your target. So they've been very productive, whether it be Pacific Dragon or RimPac or any of our exercises that we've done, and the capability that they've demonstrated is very exciting and productive for the future.

MR. ELLISON: Thank you, Sam. I'll just end with one final question for each of

you on what the most powerful thing of the MDR -- that you think that study represented for the future of missile defense? I'll start with you, John, and conclude your remarks.

SEC. ROOD: First of all let me say thank you, Riki, for bringing this group together and for the role that you play. In the missile defense world we often talk about high speed body-to-body intercepts. With your background as a former linebacker where you conducted high speed body-to-body intercepts of leading running backs, you're probably well placed to attack this mission area, and you certainly do and make a big difference.

MR. ELLISON: My processor is a little off, but other than that.

(Laughter).

SEC. ROOD: But in this world I think for the Ballistic Missile Review the biggest part is look at the title, Missile Defense Review. The biggest area where we're entering a new era of missile defense in this is about ballistic missile defense, hypersonic defense and cruise missile defense, and what that means for not only the United States. But as mentioned in the report, the progression of that defense capability with our allies, because that's just the central component of where we're going. So as you mark these phases of what we've tried to do as a nation in the chapters of a book, if you will, I think this will be the start of the next one to do that, and we're going to do that with some new technologies and new approaches as well, starting with sensor capability in space, things we can see, then we can therefore intercept, and so on. General Greaves talked about a number of the improvements that will be made. So thanks again, Riki, for having us here.

GEN. GREAVES: Let me add my thanks, Riki. This has been a great opportunity to continue the dialogue of what's really in this Ballistic Missile Review, what it means from the various perspectives and responsibilities that we each have. I will say overall the biggest benefit that we the agency will receive from the Ballistic Missile Review is the fact that it provides focus, it provides synchronization, it provides direction to help guide discussions at least within the Department of Defense, and then with the administration at-large and with the Congress on the Hill, and the American public.

I'm sure any of you who have been part of large organizations know that there are 5,000 people with 5,000 different ideas on what's best, depending on what day of the week it is. If you're trying to, what we call in the agency turn dreams into reality, working with industry to put rubber on the ramp and deliver capability, you need that focus. You need that guidance, you need that policy to help drive that discussion to deliver on that rapid decision-making that we're set up to go do. We're built for speed, but without something like the MDR it makes it very difficult.

So from our end, with the president of the United States releasing this document and making the statements that he did within the administration, I'm not sure where else you go for direction. We know what has been requested, we know what's demanded, we

know what's expected. It's now time, and I'll mention it again -- Secretary Shanahan talked about being part of the department that gets stuff done. It's now time to get stuff done and we're doing it in a very disciplined manner. So I appreciate, again, the chance to continue this discussion.

MR. ELLISON: Thank you. Thank you, general. Thank you, John, Thank you, ladies and gentlemen. It's a great event today. Thank you.

(Applause).