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ARMED SERVICES

UNITED STATES SENATE

TO RECEIVE TESTIMONY ON THE DEPARTMENT OF DEFENSE MISSILE DEFENSE ACTIVITIES IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM

Tuesday, May 13, 2025

Washington, D.C.

ALDERSON COURT REPORTING
1029 VERMONT AVE, NW
10TH FLOOR
WASHINGTON, DC 20005
(202) 289-2260
www.aldersonreporting.com

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Tuesday, May 13, 2025

U.S. Senate
Committee on Armed Services
Strategic Forces Subcommittee
Washington, D.C.

The subcommittee met, pursuant to notice, at 4:45 p.m., in Room SR-232A, Russell Senate Office Building, Hon. Deb Fischer, chairwoman of the subcommittee, presiding.

Subcommittee Members Present: Senators Fischer, Tuberville, King, and Kelly.

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

Senator Fischer: I call this hearing to order. I would like to thank the witnesses for being here today.

This Subcommittee has long worked on a bipartisan basis to strengthen and improve our national integrated air and missile defense architecture. Our adversaries continue to improve and diversify their ability to hold the homeland at risk, including through ballistic, hypersonic, and cruise missiles. I remain deeply concerned that the status quo will not suffice in the coming decades, and I look forward to hearing from each of our witnesses about their work on the Department's various missile defense activities.

General Guillot, as the Commander of NORTHCOM you are ultimately responsible for the defense of our homeland. I look forward to hearing how NORTHCOM is working to enhance domain awareness to provide a common picture of the operational environment.

Ms. Yaffe, as you stated in your written testimony, missile defense and the space domain are intrinsically linked. I look forward to hearing your views on the evolution of missile defense and how space-based systems can continue to play an important role going forward.

Lieutenant General Collins, I understand the Missile

Defense Agency will retain its key role in developing, testing, and integrating many of the technologies that comprise our missile defense system, and I look forward to hearing how we can expect to expand on these efforts in the coming fiscal year.

Finally, I would like to welcome Lieutenant General Rasch, in his capacity as the Executive Officer of the Guam Defense System Joint Program Office. I look forward to hearing from you about the progress being made to expand and improve the integrated air and missile defense of Guam, which will protect over 160,000 American citizens living on Guam.

I understand that we are still waiting for details of the fiscal year 2026 President's Budget Request to be released, and that the President is in the final stages of making key decisions about the Golden Dome system. While this means that follow-on conversations will be necessary once the Administration provides us those details, I still expect a robust conversation this afternoon on the future of missile defense. Thank you again.

Senator King, would you like to make some opening remarks please.

STATEMENT OF HON. ANGUS S. KING, JR., U.S. SENATOR FROM MAINE

Senator King: Thank you very much, Madam Co-Chair. Can I say that?

Senator Fischer: Yes.

Senator King: Thank you. This Subcommittee does work very strongly on a bipartisan basis. We look forward to your testimony. Very important hearing today with regard to a very important subject.

Ms. Yaffe, I don't expect you to answer these questions now but I am giving you a preview. One of the questions is, in light of the multiplicity of threats now, whether it is standoff cruise missiles, ICBMs, sea-launched missiles, space-based weapons, is missile defense feasible? In other words, is it technologically feasible if we face a serious attack from an adversary that has not several dozen missiles but several thousand.

Mr. Guillot -- or General, I am sorry -- one of the questions I am interested in is the importance of sensors. This discussion is often about missiles, but it is also about knowing what is going on, and particularly in your AOR I think there are some serious questions that bear discussion about our situational awareness.

And finally, General Collins, I am interested in what is Golden Dome. In other words, what is the plan? What

does it consist of? I did a little AI research this morning and found out Israel is exactly the same size as New Jersey. So having a missile defense system in a limited space, also that defends against pretty small caliber munitions from the terrorists in the region, obviously more serious from Iran, but whether that concept can be transferred to the continental United States is a question I will be interested in.

So I look forward to all of your testimony. Very important hearing. And I appreciate all the work that you do and the service you provide to the country.

Thank you, Madam Chair.

Senator Fischer: Thank you, Senator King.

Now I would like to begin with statements from each member. Who is going first at this point? Ms. Yaffe?

STATEMENT OF ANDREA YAFFE, ACTING PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY, DEPARTMENT OF DEFENSE

Ms. Yaffe: Thank you. I am happy to start out to provide the policy perspective.

Chair Fischer, Ranking Member King, and distinguished members of the Committee, thank you for inviting me to testify on the Department of Defense's missile defense posture, on behalf of the Office of the Secretary of Defense. I am grateful to appear alongside my distinguished colleagues.

Missile defenses are a vital element of our strategic force posture, both as a means of deterrence as well as defending the U.S. homeland and security interests abroad. As we see nearly every day in conflicts across the world, offensive missile capabilities are now a central feature of modern warfare and routinely deployed to coerce and intimidate opponents, inflict tactical damage, and carry out strategic campaigns.

Our adversaries are investing in the next generation of offensive capabilities to hold the United States homeland at risk, coerce our allies and partners, and threaten our deployed forces.

To counter these growing threats we need next-generation missile defeat and missile defense architectures

that can complement our existing nuclear and conventional offensive capabilities. The President has mandated that the United States will develop and field a next-generation missile defense shield to provide for the common defense of our citizens and the nation and deter, defend against, and defeat any foreign aerial attack on the homeland. We will also guarantee our secure second strike capability. This broad mission set is the task before us today.

Missile threats pose a substantial and growing risk to the American people, U.S. national interests, and our allies and partners. The growing cooperation and potential for more coordinated action among China, Russia, North Korea, and Iran is reflecting a shared interest in undermining U.S. interests globally.

We also see these countries working together to advance their respective interests. Russia has provided technical and economic assistance to North Korea and Iran in return for thousands of munitions, attack drones, and ballistic missiles. Russia has employed North Korean missiles in Ukraine, resulting in improvements in their accuracy and destructive capability.

DoD must content with adversaries possessing a range of sophisticated technologies, including advanced cruise and ballistic missiles and maneuverable HGVs, as well as lower-tier threats like unmanned aircraft systems from both

state and non-state actors. These capabilities continue to evolve and include a wide range of platforms, speeds, distances, and attack vectors that are easily concealed and evasive.

This is where the value of missile defense, a core component of deterrence by denial, comes in. Robust missile defense capabilities raise the threshold for conflict and introduce uncertainty and complexity into attack planning, thereby undermining an adversary's confidence that an attack will be successful. The greater the cumulative challenges for an adversary, the greater the likelihood of avoiding an attack in the first place. If deterrence fails and an attack does occur, missile defenses limit the damage and assure the means of effective responses.

Moreover, missile defenses provide time and space for the President to decide how to respond most effectively. The financial outlays of missile defense and missile defeat today more than offset the exponentially greater costs that would be incurred by the lack of defenses in a potential conflict tomorrow.

Missile defense systems also contribute to deterrence by reinforcing our diplomatic and security posture while reassuring allies and partners. Should deterrence fail, the United States, our allies, and partners would need

robust missile defense and defeat options, not only to defend and protect our interests but also to manage escalation. Integration with our allies and partners improves our all-domain awareness, redundancy, and shot deconfliction. The deterrence by denial contributions to missile defense continue to serve as a complement to the cost imposition strategies offered by our conventional and nuclear forces. Together they give our decision-makers time and credible options to deter aggression, assure lethality, protect the American people from harm, and respond to attacks if deterrence fails.

The Department of Defense remains committed to making the necessary investments in our strategic posture to deter our adversaries and, if deterrence fails, to prevail in conflict. The missile defense and defeat mission requires sufficient and consistent funding and support.

Thank you for your dedication to our mission and our servicemembers and for the opportunity to testify to you today alongside my colleagues. I look forward to answering your questions.

[The prepared statement of Ms. Yaffe follows:]

Senator Fischer: Thank you very much. General Guillot, welcome.

STATEMENT OF GENERAL GREGORY M. GUILLOT, USAF, COMMANDER, UNITED STATES NORTHERN COMMAND AND NORTH AMERICAN AEROSPACE DEFENSE COMMAND

General Guillot: Chair Fischer, Ranking Member King, and distinguished members of the Subcommittee, thank you for holding this important hearing. North American Aerospace Defense Command and United States Northern Command have critical roles in defending the homeland from missile attack, and your support remains vital to our success.

I would like to start by recognizing the tremendous work being done by Lieutenant General Collins, ASD Yaffe, and Lieutenant General Rasch. NORAD and NORTHCOM are fortunate to have such committed partners in our shared no-fail mission.

Defending the United States from missile threats remains a top command priority. That mission is more important than ever as global competitors continue their rapid development and fielding of advanced missile capabilities and delivery platforms along with increased cooperation and technology sharing.

To counter these growing challenges, NORAD and NORTHCOM rely on realistic planning, on-time investments based on specific threats, and forward-looking policies that ensure the command's ability to detect, track, and

defeat potential threats in all domains.

To ensure our ability to defend against missile attacks, NORAD and NORTHCOM require a layered, domain awareness network, from seabed to space, to detect and track threats to North America. That sensing network is vital to today's ballistic and cruise missile defense missions and to the Golden Dome concept because we can't defeat what we can't see.

Alongside improved domain awareness we must also improve our capability and capacity to defeat advanced missile threats. The Next-Generation Interceptor is vital to countering North Korea's growing ICBM capability. And innovation investment in advanced defeat mechanisms, which could include directed energy and boost-phase intercept will be crucial against cruise missiles, hypersonics, and other advanced threats.

There are significant challenges ahead of us, but NORAD and NORTHCOM stand ready to deter aggression and defeat threats to our nation.

Again, thank to this Subcommittee and my fellow witnesses for your continued support, and I look forward to your questions. We have the watch.

[The prepared statement of General Guillot follows:]

Senator Fischer: Thank you, General. General Collins, welcome.

STATEMENT OF LIEUTENANT GENERAL HEATH A. COLLINS, USAF, DIRECTOR, MISSILE DEFENSE AGENCY

General Collins: Thank you, ma'am. Good afternoon, Chair Fischer, Ranking Member King, distinguished members of the Subcommittee. Thank you for this opportunity to talk about the Missile Defense agency portfolio.

MDA is moving quickly to provide effective defenses against a dangerous missile threat to defend the U.S. homeland, our deployed forces, and our allies and friends. The agency is transforming itself, its enterprise, and its industry base in order to develop and deliver capabilities to the warfighter, at scale and speed.

As we move with urgency to deliver the next-generation missile defense system, we intend to leverage the performance efficiencies found at integrated layered defenses. We also will continue to integrate and improve the space domain to support a missile defense posture that is more effective, resilient, and adaptable, to known and unanticipated threats.

MDA's focus is on the improvement and sustainment of U.S. homeland and regional defenses. We are enhancing the performance and capability of the fielded, Ground-based Midcourse Defense system along with development and testing of the Next-Generation Interceptor. We are working with the Navy to improve the Aegis BMD capability and enhance

hypersonic defenses, and with the Army to make investments in the future development of the Terminal High Altitude Area Defense system, THAAD.

Together in support of the nation's missile defense enterprise and Golden Dome for America, MDA remains focused on delivering advanced, reliable, and resilient capabilities on accelerated timelines to meet the warfighter's needs.

I greatly appreciate your continued support for MDA and for the missile defense mission, and I look forward to answering your questions. Thank you.

[The prepared statement of General Collins follows:]

Senator Fischer: Thank you, General. General Rasch, welcome.

STATEMENT OF LIEUTENANT GENERAL ROBERT A. RASCH, USA, EXECUTIVE OFFICER, GUAM DEFENSE SYSTEM JOINT PROGRAM OFFICE

General Rasch: Thank you, Madam Chair. Chairman Fischer, Ranking Member King, and distinguished members of this Subcommittee, thank you for the opportunity to appear before you today to discuss the criticality of defending the island of Guam. On behalf of the Army Senior Leadership, we thank you for your continued support of our soldiers, sailors, airmen, Marines, Guardians, civilians, and their families.

Guam is an indispensable part of the homeland, and its defense is not only essential to the security of the United States but is also a strong deterrence to the ever-evolving complex threats we face. The fiscal year 2023 National Defense Authorization Act required the Secretary of Defense to designate a senior official to oversee the missile defense of Guam. In February 2024, as directed by the Under Secretary of Defense, Acquisition and Sustainment, the Guam Defense System Joint Program Office, JPO, was established at the Army Rapid Capability and Critical Technologies Office. Beyond the Department's investments in Guam's defense, the Under Secretary of the Navy is the appointed lead senior defense official for all other DoD efforts in Guam.

The Joint Program Office is charged with synchronizing

the development, testing, fielding, and sustainment of the Guam Defense System components and the integration of the corresponding command and control systems resulting in the development of a Joint Integrated Battle Manager, and this Battle Manager will allow current service and agency-owned components to behave as an integrated and unified system.

The Joint Program Office works closely with the Under Secretary of Defense for Acquisition and Sustainment, the Guam Synchronization Oversight Council, and leadership across the services and the Missile Defense Agency to build and sustain an architecture capable of defending Guam against a multitude of complex air and missile defense threats.

Together, the Department is working diligently and with urgency to secure the initial capability increment in 2027. This will provide capability well beyond the currently employed THAAD battery as part of Task Force Talon. Your continued support ensures that we remain capable of fighting for and from Guam, meeting the challenges of today and tomorrow.

Thank you again for the opportunity to speak with you about this critical mission and the joint commitment to the defense of Guam. Thank you.

[The prepared statement of General Rasch follows:]

Senator Fischer: Thank you, General Resch, and thank you all for your opening statements.

We don't have too many of us here today so we may have more than one round of questions. I will begin the first round.

General Guillot, I have appreciated our past conversations about the need for increased domain awareness, for we cannot shoot what we cannot see. As we look towards Golden Dome and the future of missile defense, what additional improvements need to be made with respect to domain awareness?

General Guillot: Madam Chair, I think that what I call the domain awareness layer of Golden Dome is the most critical that we need to have first, for the reasons that you just mentioned. Any chance of using advanced interceptors or defeat capabilities would not be possible if we can't detect and track these threats.

I think that it is a seabed-to-space approach. We need to have undersea sensors to detect submarines that can now get closer to North America than they could before, based on improved stealthiness of those ships. And then a ground layer that can see much further out because of the advanced standoff weapons that our adversaries can now employ. We need an air layer, like the E-7, to close the kill chain with fighter aircrafts or surface-to-air

systems, and then a space layer. The space layer would both track airborne moving targets or aircraft, but also systems like HBTSS that could track hypersonics, as well as the warning capability that we need to detect the launches to begin with.

Senator Fischer: Is there anything you can tell us in this setting about Golden Dome and the options that may be available on the sensors and the radar systems that would be used?

General Guillot: Madam Chair, I don't know what the Golden Dome will look like, but I suspect that it would be able to use a lot of the systems that are already in place and currently in development, which would give us a full capability in probably something closer to zero to five years, as opposed to something, you know, a decade out into the future. A couple of those systems would be the HBTSS that I just mentioned for the hypersonics, space-based AMTI, which we have a number of prototype systems on orbit now, over-the-horizon radars which are also operational in, not in the United States, but elsewhere. And then for instance, the E-7 which many other countries operate.

Senator Fischer: So given that, how much risk would Golden Dome incur if the department was forced to vacate the lower 3 GHz or a portion of the 7-8 GHz spectrum that it now has?

General Guillot: Madam Chair, it is my assessment that we would assume an extraordinarily high level of risk if we lose control of those portions of the spectrum. Many of the systems that we rely on every day today, much less in the future, for homeland defense, reside in that spectrum range.

Senator Fischer: Thank you. General Collins, can you provide us with an update on the Hypersonic and Ballistic Tracking Space Sensor, or the HBTSS system?

General Collins: Yes, Madam Chair, thank you. So, the Hypersonic and Ballistic Tracking Space Sensor is a prototype program that MDA pursued to prove out the technology such that from space we could close the kill chain on a hypersonic weapon. And the focus of that was to prove out that the space system could have the accuracy, the track quality, and get that data into the command-and-control system fast enough to be able to close that fire control loop.

Those two systems, launched in February of last year, have gone through two test bed launches where we had a test bed target launch fly a hypersonic profile, and we have collected data from the sensors during that. So far, we have proven out the timeliness, latency of the fire control loop with those systems, as well as the sensitivity of those systems to close the loop. We are going back with

some algorithm updates into the payload to improve on the track quality. But we see that closing as well.

It has been a very successful prototype program, and all along, we have worked in parallel with the Space Force and Space Development Agency. They now have our HBTSS-like requirements as part of their proliferated warfighting space architecture. And in the tranches to come in the follow-on years they will slowly be building up an operational hypersonic tracking layer for us.

Senator Fischer: Thank you. Perhaps in another setting we can talk about a more definitive timeline when that would be available. Thank you.

Senator King.

Senator King: Thank you, Madam Chair. The nature of my questions may appear to be critical. I am certainly in favor of defending the homeland against missile attack. No question. My fundamental question is, is it feasible, given today's technology and also the cost involved. I will quote Lincoln: "Your critic is your best friend," so take it in that spirit.

For example, Ms. Yaffe, you mentioned deterrence by denial. Is that really viable today, deterrence by denial? Can we realistically say that we could deny a substantial missile attack from Russia or China, or heaven forbid, both?

Ms. Yaffe: Senator --

Senator King: I am a great believer in deterrence. I am just not sure deterrence by denial is realistic in this setting. Convince me.

Ms. Yaffe: Senator, thank you for the question. This is meant to be an integrated air and missile defense system that is intended to send a message to the adversary that they may not achieve their objectives. What we want to do is place the burden of escalation on the adversary and demonstrate that it will be harder for them to achieve their objectives in an attack.

Right now, as you are well aware, we do not have a homeland missile defense system that is intended to guard against adversary threats beyond North Korea or rogue state actor threats. Meanwhile, the threats themselves have been expanding significantly, with Russia and China pursuing a breadth of capability --

Senator King: Well, that is my point. We have developed a Missile Defense Agency essentially to defend against North Korea and Iran and perhaps a rogue, not China and Russia. Now we are talking about an accelerating Chinese pursuit of this capability. Russia already has the largest nuclear stockpile in the world.

What level of scaling up would it take to have a missile defense system capable of providing any realistic

deterrent to China and Russia?

Ms. Yaffe: Sir, this is not an answer that will be deliverable overnight. However, what the President has done is challenged us to actually look at what an integrated air and missile defense system of the homeland would look like, which is not something we --

Senator King: What does that mean? Is that 1,000 THAAD batteries around cities?

Ms. Yaffe: Sir, I can't weigh in on what the specific architecture would look like. I can't get ahead of what the architecture decision will be that will come out, I think, with the budget. However, it is intended to leverage new technologies to get ahead -- we have got, certainly, the lift in the executive order -- but to leverage some new technologies both to accelerate the deployment of the HBTSS on the hypersonic side, also to leverage non-kinetics. And I know that you are interested in directed energy to see what directed energy might be able to help with, to help us change the cost curve.

But it should be a mix of new technologies that we might be able to demonstrate in the next 4 or 5 years, along with --

Senator King: What is the assumption --

Ms. Yaffe: -- legacy systems.

Senator King: General Collins, what is the assumption

of how many GBIs would have to be launched to knock out one North Korean ICBM?

General Collins: Sir, that would be a classified number. We would have to wait until the closed session to answer that.

Senator King: All right. Well, General Guillot, you mentioned seabed. Isn't that a critical area where we need better sensors, better knowledge, and particularly in your AOR, in the Northwest?

General Guillot: Senator, absolutely. It is critical, the seabed. Detection and awareness of the seabed and the undersea environment are critical to homeland defense.

Senator King: And the Russians are, in fact, significantly building up their military infrastructure on their shore of the Arctic Ocean. Is that correct?

General Guillot: That is correct, Senator.

Senator King: So that is an area where we have to have better visibility, and also to the west, as the balloon incident told us.

General Guillot: Yes, sir. All true.

Senator King: You mentioned directed energy. The reason for my question, General Collins -- and I understand in classified -- but those interceptors are about $60 million a copy. I can understand maybe that is a

reasonable number if you are talking about a limited capacity of North Korea or Iran, but if you are talking about between now it is 300, up to 1,000 missiles in China, I don't know how many, several thousand, from Russia, the economics don't work. How do you feel about the potential of directed energy, which is about 75 cents a shot once it is installed?

General Collins: Yes, sir. We are certainly interested in pursuing directed energy from a missile defense perspective. At this point in time, we are years away from having a capability that would be able to have an effect against an intercontinental ballistic missile. So for the near future we will still very much rely on the layered approaches that we have today for ballistic missile defense.

Senator King: Define layered approach. You have used that term several times.

General Collins: Yes, sir. We look to be able to take multiple engagements on any missile as it is coming in. So in a perfect world we would try to intercept and take out the missile when it is still coming out of the ground and being launched from the enemy territory. That is the boost phase. While it is in space it is midcourse phase, and then as it is coming back into the atmosphere it is the terminal phase.

Today we very much focus on the midcourse for engagements. We would certainly look to be able to try to bring technology to bear that we could get into the boost phase preferred, but then we may also have capabilities, an underlayer of capability, that could be brought to bear to then have a second shot or a second engagement capability while it is in terminal.

So the layers of defense, or defense in depth, is what I refer to when I mention layered missile defense.

Senator King: I think the prior administration lowered the directed energy budget by a half over the past 4 or 5 years. I think that was a terrible strategic mistake. I hope this Administration will remedy that, because you mentioned it is going to be years. One way to make it months instead of years is to devote more resources to the research and development of that capability, which it seems to me is clearly the technology of the future in this field.

Thank you, Madam Chair.

Senator Fischer: Thank you, Senator King. Senator Tuberville.

Senator Tuberville: Thank you. Sounds like a guessing game to me, a lot of things that are going to happen, and of course, I don't know how many missiles could reach our mainland that they have right now, but obviously

space is going to decide a lot of that, with missiles coming from space in the near future.

But that being said, General, how are we doing on Guam? We got the Aegis system started, what, about 3 years ago, maybe a little less? How are you doing? Getting better?

General Rasch: Senator, getting better. Lots of teamwork across the services and with Missile Defense Agency, and my hat goes off to General Collins and his team who really led the Department of Defense in early implementation, all the legwork for laying the ground efforts for the military construction that occurred there.

MDA demonstrated this last year early Aegis Guam capability with a flight test that was executed there, very successfully. That work was really the starting point. That equipment has stayed on site. It offers a credible deterrence against potential adversaries, while the Army then does its planning to come in, in the '27 time frame, with the next, what we call tranche one of capability for Guam.

It is a lot of consensus building. It is a lot of teamwork across the Department of Defense. This is the homeland, so, in in several ways, we are learning a lot of lessons that we believe can also apply to the Golden Dome team as they continue that mission set. But very

optimistic that the Army is going to meet its mission, that will have a credible capability on island in the time frame we lay out.

Senator Tuberville: Have we decided who is going to operate it?

General Rasch: Well, that decision, as we build out the overall command and control capability, the C2 for the defense of Guam would typically fall to the Air Force to conduct that overall coordination. But it will be manned jointly as we have both Navy systems, Air Force systems, Army systems on the ground. We will have, you know, servicemen and women from all of those services operating it typically under an Air Force leadership who will then report to the combatant commander, Admiral Paparo.

Senator Tuberville: Does that include Reserve, National Guard?

General Rasch: Sir, it absolutely can. And even with the small footprint the Army has had on island today with the Task Force Talon, which is the THAAD battery, we have relied heavily on the Guam National Guard who provides a security force for that unit that is operating away from a typical Army base. A great job of those soldiers, supporting that mission truly defending the homeland. And within the Army, there is talk about potentially expanding that mission set for the Guard members on Guam. It is

still under discussion, so I can't get ahead of those decisions as they play out. But I believe all things are on the table at this point.

Senator Tuberville: Thank you. I know it is a long process, a long process. I mean, how many years do you think we have got left to be fully operational?

General Rasch: Senator, I believe we will be improving this capability forever, and defense never rests because offensive threat never rests. So, we will continually evolve. The point of our effort is to try to get as much capability as soon as possible. And capability isn't just a thing. It is not just, you know, a launcher. It is not just a radar. It is not even just a command and control. It is soldiers, you know, airmen, you know, all the folks actually manning this equipment, ensuring they are properly trained. It is ensuring that we have the proper sustainment tail on island to support it, that we can sustain it not just for a day, but for years in time. So, we will be at this for a while.

Senator Tuberville: It is like defending a different offense every week, if you are a football coach. You have got to change, don't you?

General Rasch: Absolutely, Senator.

Senator Tuberville: Thank you. General Collins, thank you for the footprint you have in my state of Alabama

at Redstone Arsenal. We are proud of all the work you are doing. How much of MDA's effort and investment in Golden Dome do you expect to take place in Huntsville? And do you expect to request any additional resources for maintenance or buildings or anything like that in the future?

General Collins: Well, Sir, Missile Defense Agency is really proud of being part of the Tennessee Valley and that Redstone Arsenal. Certainly, a large contingent of our workforce is at Redstone Arsenal, and as well as many of our industry partners are in that area, as well.

And so, I can't give you an exact percentage, but certainly the engineers, the program managers, the contracting officers, the entire workforce of Missile Defense Agency and the associated industry members are going to be very busy and very devoted to making any of the parts of Golden Dome real.

Senator Tuberville: You are building things right now too, right? You have got things under construction, I think the last time I was there.

General Collins: Yes, sir. We are doing them. We are in the middle of a ground test facility infrastructure update, which is a fairly large renovation and construction project that is going on. And that is going on right now, to help get us ready for the ground test infrastructure we need to support next gen missile defense. And as we start

digesting and dissolving the Golden Dome requirements, there may be additional requirements that we need to make sure we are ready to go.

Senator Tuberville: I got one more question, if we got time here. General Collins, I want to ask you about our space-based sensors, which is an absolutely critical component of any effort to develop the next-generation missile defense capability. Last year, the U.S. put a new hypersonic and ballistic tracking space sensor satellite in orbit. Do we have any plans, either as part of the Golden Dome architecture or independently, to expand that capability?

General Collins: Yes, sir. We, as well, believe that a very effective and resilient space layer is going to be critical to the future missile defense requirements of the homeland as well as our deployed forces. We rely on space assets today as part of our kill chain for initial tip-off, and we will continue to do that.

The Space Force, Space Development Agency, will operationalize the HBTSS capability. The relationship we have with Space Force is we may prototype technology that is required and prove it out for missile defense. The Space Force will operationalize that capability as we move forward, and HBTSS will be foundational. That type of technology will be foundational to hypersonic missile

defense in the future. And we are working on future prototyping space sensor capabilities, in particular, discriminating space sensor to help improve ballistic missile defense in the future as well. We will prototype and Space Force will operationalize. And so space will be very key to protecting the homeland and our deployed forces in the future. Thanks, Senator.

Senator Tuberville: Thank you. Mr. Chairman.

Senator Fischer: Thank you, Senator Tuberville.

General Rasch, when you look at the defense that Guam is going require, you and I, earlier today, we had a conversation about that and the importance of integrating those systems -- Army, Navy, MDA.

My Co-Chair talked about directed energy and how important the uses of that could be, and it would be a lot cheaper. But can you compare the systems that we need to integrate for the defense of Guam specifically, and some of the challenges that we face looking at directed energy and the capabilities it has in some more adverse conditions that are out there, maybe not always ready, and the different options it provides you and your soldiers with as you look towards defending that island?

General Rasch: Madam Chair, absolutely, and thank you for the question. As we spoke earlier, the new thing that we are doing for Guam is not just putting the individual

material systems and programs on island, but really taking the first step at integrating the command and control functions. So Air Force has a system, TOC Light. The Navy has their Aegis system, which will be Aegis Guam. Missile Defense Agency has C2BMC, and the Army has the Integrated Air Missile Defense Battle Command System, IBCS. These are four separate systems that loosely interoperate now, but we believe that is not good enough in the long term. So we are integrating these with a layer of decision support on top of the Joint Integrated Battle Manager.

This capability will leverage a lot of the work that Missile Defense Agency has done to date in that single integrated air picture arena, of getting a common air picture with those systems, and then providing a layer of decision aids on top, so that the decision-making, who has got a hard decision to make on a potential threat, can actually do fire direction to the appropriate system that actually has a killing capability.

So that is the new work that we are doing for Guam from a command and control or fire control perspective.

With regards to directed energy, as General Collins said, the technology is evolving, and the Army, I know, has invested a lot in ground systems from a directed energy perspective. We have deployed several of those systems overseas to get continued operational assessment. And for

the defense of Guam there is the potential, as those technologies continue to evolve, to be integrated in as part of this architecture.

Realizing, though, that directed energy is not a panacea. As you pointed out, there are days, good days and bad days, for lasers. Weather can affect their lethality. It can affect the range. So as we continue to learn about this technology and what its capability is, we also have to ensure that we integrate the atmospherics at the time. You know, as you get closer to the Earth the air is dirtier. Windy days create dust, which can reflect or refract the light. Moisture can do the same thing, if it is raining.

So having a mix of capabilities, and that the soldiers that are operating that integrated system understand basically how good the laser is today. The ranges of those directed energy systems are not out at the ranges of our more exquisite and expensive missile systems are.

So we have to build that trust with the soldiers, that if they let a threat getting closer, to allow directed energy to be the effector, that it is going to work. So that is something that the Army, I know, was working at lower powers, necessarily, than we would put on Guam, but starting down that venture now, and we are looking forward to seeing where that technology takes us.

Senator Fischer: Thank you, General.

Senator Kelly, you are recognized.

Senator Kelly: Thank you, Madam Chair. General Collins, so last year Missile Defense Agency proposed termination of the SM-3, and months after that termination recommendation that missile was used in defense of Israel against ballistic missiles. So based on the recent combat experience with the SM-3, and I am not sure exactly what the number of rounds that were fired, but what is the current plan for the SM-3 going forward? Has that plan been reevaluated?

General Collins: Thanks, Senator, for that question. Certainly in last year's hearing we certainly talked about the decision, the fiscal decision that was made to terminate the SM-3 Block 1B line. And since that, you are very right, it has been a workhorse in the Eastern Mediterranean, protecting the citizens of the State of Israel.

As we now are planning with the increased focus on missile defense of the homeland and missile defense in general, the future decision space within the SM-3 program is being re-looked at, as part of the deliberations for Golden Dome, and, as well, with the President's budget that is in development.

What I would also, though, say is through a number of supplementals we do appreciate the support that has come

through supplemental funding that has come back to replenish the SM-3 1B lots that were expended in the Eastern Med, and we will continue to track that very closely with both the Block 1B and the Block 2A's, moving forward.

Senator Kelly: Do you know how many rounds were fired, SM-3 rounds?

General Collins: I do not have the latest but it is in the dozens.

Senator Kelly: And the SM-3 line has not been shut down at all, so it sounds like, in fact, the rate of production has increased.

General Collins: The rate of production is still continuing. We still have fiscal year 2024 and fiscal year 2025 plus the supplemental funding that still will go on contract before the end of this year. So that line will still remain open for years into the future. It takes a few years from beginning to end to get those rounds out.

The funding decisions, though, are here and now, to make sure that we continue to keep that line open and viable as we move forward.

Senator Kelly: Go back to last year when the decision was made to terminate production of SM-3. What was the plan for the follow-on missile that would perform the duties of the SM-3?

General Collins: Sir, there was not a plan set forward on a replacement for the SM-3 1B. It was to rely more on the Block 2A line, which is a larger, more expensive missile, but the quantity production rates were lower for that missile. But that was the decision.

Senator Kelly: General Rasch, I appreciate all the work you and your team have done on the Guam defense system. I am interested in hearing any lessons from Guam Defense that can be applied to Golden Dome as we come up with a plan. I know the study has been, well, the timeline for the 60-day study is complete. But anything that informed that study from Guam Defense?

General Rasch: Senator, thank you for your question, and absolutely lessons learned. Guam, being part of the homeland, provides a lot of the same challenges that we will have here at CONUS. Interagency cooperation and coordination will be required. We have certainly learned that on Guam, so it is not just a DoD venture. It is bringing in the whole-of-government as far as site locations, environmentals, everything that we have to do there. And we have certainly shared that across with the teammates as they are thinking about the Golden Dome, the Golden Dome challenge.

The other area that I believe is significant is the integration of our command and control systems. Our

services have typically fought the air missile defense threat as stovepipes, and so our work to do that level of integration, for at least the land piece of those systems, from the Army, the Navy, the Air Force, and Missile Defense Agency, to start the integration of that, absolutely should be a model, or at least a starting point for how we take on the bigger challenge of developing and air missile defense capability across the entire continental U.S.

Senator Kelly: Ms. Yaffe, on the 60-day study, I know the report has gone to the White House. I don't know if the President has signed off on it yet. It doesn't sound like it. But I want to just hear, if you can speak to what kind of preliminary activities have been accomplished and anything you can say about what you have discovered in the 60-day study.

Ms. Yaffe: Sir, thank you. I think I can say broadly, as you know, this executive order really challenged the Department to take this integrated approach in a really unprecedented way that would require the breaking down of silos to be successful.

When it came into the building, our office, the Office of the Secretary of Defense, joining with Joint Staff to bring together all of the stakeholders and start working on different design options, we matured them to a place where the technical experts took over and really refined them

into a few different options to bring to the Secretary.

My understanding is the Secretary of Defense and other Department leaders have engaged with the President, and the hope is that there will be an announcement soon, certainly tied with the budget. There was a breadth of options looked at that tied the new and potential ways to accelerate developmental capabilities to get some demonstrations with the existing capabilities, so that we can have an integrated, layered system.

Senator Kelly: Okay. Thank you.

Senator Fischer: Thank you, Senator Kelly. Senator King you are recognized.

Senator King: General Rasch, I am very interested in Guam as a test bed, which has been discussed repeatedly in this hearing. My question is, how much has the development of missile defense infrastructure on Guam cost?

General Rasch: Senator, that is a good question, and obviously one that gets a lot of interest because there tends to be a conflating of different costs to support overall the island of Guam. Obviously still recovering from a horrible typhoon a few years ago. There are dollars that the DoD is investing in fixing things that were damaged.

Senator King: No, I understand that. But can the defense piece that you have discussed here today, be

isolated and identified? Somebody must know what it has cost.

General Rasch: Yes, Senator, it can, and we have estimated that at about an $8 billion investment. Not new investment but really it is the cost of the systems that the services were building already that will now be located at Guam, approximately $8 billion across all of the services when you look through the overall cost of the individual components.

Senator King: I find that concerning because I just did a calculation there -- 779 cities in the United States with more than 50,000 people. In fact, Guam is half the size of San Antonio. So if we are talking about providing the level of defense that we have on Guam for our citizens in our country, we are talking about an awful lot of money. I can't do the math in my head, but 800 times $6 billion is a pretty astronomical cost.

Again, as you can tell, I am skeptical. I want to be proven wrong. And I look forward to future hearings and discussions and seeing how Golden Dome evolves. The question is, is it the best place to put our money, or should we be developing our deterrent capability and accelerating the reconstruction of the Triad as a more effective deterrent than one that looks like it has some technical and financial questions.

But I think the next time we have this hearing we probably will have some more answers about what Golden Dome actually looks like. And don't get me wrong. I am all for protecting the homeland. It is just a question of how much will it cost relative to other defense needs and how effective can it be technologically, given the development of things like hypersonics, maneuverable missiles that, as you know, General Guillot, are below the level of traditional sensors and much more difficult to intercept.

I look forward to continuing this discussion, and certainly I hope, Madam Chair, that as soon as Golden Dome is more formulated we can have a hearing to discuss its components.

Senator Fischer: Thank you, Senator King. I agree with you. I believe Golden Dome is part of the mix and the options that are out there as we look at the defense of our homeland, and specifically in the Indo-Pacific with Guam, as well. We have heard from a number of our panelists at posture hearings but also in classified briefings that the Administration has followed previous administrations in putting the top priority on our Triad, on modernization, on making sure that the President will have options there, as well.

So I look forward to seeing, with you, how Golden Dome is going to be able to fit in the mix, along with

hypersonics and many other options that are going to be available in the future.

With that I thank the panel for being here today. Senator King and I need to get down and vote. But we thank all of you for your dedication, for the time you give us here in the Senate, and on this Subcommittee especially, and the information you provide us. Thank you.

We are adjourned.

[Whereupon, at 5:34 p.m., the hearing was adjourned.]