[H.A.S.C. No. 115–52]

HEARING

ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2018

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

SUBCOMMITTEE ON STRATEGIC FORCES HEARING

ON

FISCAL YEAR 2018 PRIORITIES AND POSTURE OF MISSILE DEFEAT PROGRAMS AND ACTIVITIES

HEARING HELD
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FISCAL YEAR 2018 PRIORITIES AND POSTURE OF MISSILE DEFEAT PROGRAMS AND ACTIVITIES

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, June 7, 2017.

The subcommittee met, pursuant to call, at 2:57 p.m., in room 2212, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

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

Mr. ROGERS. Good afternoon. I want to welcome everybody to our hearing this afternoon: "Fiscal Year 2018 Priorities and Posture of Missile Defeat Programs and Activities."

We have an esteemed group of witnesses with us today: Mr. Todd Harvey, Acting Assistant Secretary of Defense for Strategy, Plans, and Capabilities; Vice Admiral James Syring, U.S. Navy, Director of Missile Defense Agency; Lieutenant General James Dickinson, Commander, Joint Functional Component Command for Integrated Missile Defense, and Commander of U.S. Army Space and Missile Defense Command/Army Strategic Forces Command; and Mr. Barry Pike, who has the best accent on the panel, is Program Executive Officer, Army Missiles and Space.

And before I get started, I want to take the chairman's prerogative for a minute. For almost 37 years, Vice Admiral Syring has served his country in uniform. Members of the subcommittee are most familiar with him as director of the Missile Defense Agency [MDA], which he has led since November of 2012.

I remember the problems with the prior leadership of MDA and the devastating impact on its morale back in 2012. That has all changed under Admiral Syring's leadership. I think there is no better testament to his service and leadership than the recent Ground-Based Midcourse Defense system test against an ICBM [intercontinental ballistic missile] class target.

With everything that is going on in the world, this success sends a powerful and unmistakable signal to allies and adversaries alike that we will defend ourselves from ballistic missile attack and the threat of attack.

Admiral Syring, we thank you for your service and very much hope it is not complete yet.

Admiral SYRING. Thank you, sir.

Mr. ROGERS. With that, because we were called for votes, we are on a shorter timeline, so I am going to dispense with my opening

statement and yield to my friend and colleague from Tennessee for any opening statement that he may have.

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

Mr. COOPER. Thank you, Mr. Chairman.

I would like to add my praise for Admiral Syring, for his wonderful career so far in the military. We hope it continues.

But I also want to ask unanimous consent to put my statement into the record so that we can get on with the hearing.

Mr. ROGERS. Without objection, so ordered.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 29.]

Mr. ROGERS. All right. What I would ask, so we will have time for questions and then also time to go into the classified session, is ask each witness to try to summarize their statement in 3 or 4 minutes, if they could. The full statement will be admitted to the record without objection.

First, we will start with Mr. Todd Harvey. You are recognized for summary of your testimony.

STATEMENT OF THOMAS H. (TODD) HARVEY, ACTING ASSISTANT SECRETARY OF DEFENSE FOR STRATEGY, PLANS, AND CAPABILITIES, DEPARTMENT OF DEFENSE

Mr. HARVEY. Thank you, sir.

Chairman Rogers, Ranking Member Cooper, members of the subcommittee, thank you for the opportunity to testify on priorities and posture of missile defeat programs and activities and the Defense Department's continuing efforts to sustain and modernize our homeland missile defense capabilities so that we remain ahead of the threat while providing effective, integrated, interoperable regional missile defense capability.

The U.S. homeland is currently protected by the Ground-Based Midcourse Defense system, GMD system. Improving the capacity, reliability, effectiveness of the GMD system is one of our highest priorities.

The President's budget proposal for fiscal year 2018 would fund the Redesigned Kill Vehicle, Long Range Discrimination Radar, would help lay the groundwork for a new radar in Hawaii, would continue funding advanced discrimination sensor technology and space-based kill assessment programs, remain on track to complete deployment of remaining intercepters in Alaska by the end of this year to bring the total to 44.

We are also moving forward with efforts to bolster our defenses against advanced cruise missiles. From a regional standpoint, the President's fiscal year 2018 budget request also continues the deployment of missile defenses tailored to threats in Europe, Middle East, Asia-Pacific region.

In Europe, we are continuing to implement the European Phased Adaptive Approach, EPAA, and working in close collaboration with our NATO [North Atlantic Treaty Organization] allies to develop advanced network of sensors and interceptors.

The President's budget request also supports the Aegis Ashore system that we will deploy in Poland in the 2018 timeframe. NATO allies have committed to spend more than $1 billion on NATO bal-

listic missile defense command and control, and many of our allies are improving their national BMD [ballistic missile defense] capabilities.

In Asia-Pacific, our force posture includes Aegis BMD-capable ships, along with Patriot batteries deployed in Japan and South Korea, and the recent deployment of THAAD [Terminal High Altitude Area Defense] to South Korea. We have also converted the THAAD battery deployment to Guam to permanent status in response to North Korean threats.

We also maintain robust ballistic missile defense presence in the Middle East, including land- and sea-based assets deployed in defense of our forward-located forces and those of our allies and partners. This is in addition to our efforts to build the capacity to those counterparts that will contribute to their ability to defend themselves.

We must continue to look ahead, which means ensuring that our investment strategy and priorities balance the needs of addressing the most dangerous threats we confront today while positioning ourselves to respond to emerging threats over the next decade.

On January 27 of this year, the President directed the Secretary of Defense to initiate a new Ballistic Missile Defense Review [BMDR] to identify measures to strengthen missile defense capabilities in the face of rapidly growing missile threats.

The BMDR will be informed by the administration determination to develop a state-of-the-art missile defense system to defend the homeland and our regional interests. We expect to complete the BMDR this fall, and it will complement the missile defeat report mandated by the fiscal year 2017 NDAA [National Defense Authorization Act].

The Department of Defense continues to develop, procure, and field missile defense systems to protect vital U.S. national security interests. We are determined to stay ahead of the adversaries' ballistic and cruise missile developments, seek capabilities to lower cost per intercept, and defeat emerging ballistic and cruise missile threats.

Thank you for the opportunity to appear before you today. Look forward to your questions.

[The prepared statement of Mr. Harvey can be found in the Appendix on page 30.]

Mr. ROGERS. I thank you.

The Chair now recognizes Admiral Syring.

STATEMENT OF VADM JAMES D. SYRING, USN, DIRECTOR, MISSILE DEFENSE AGENCY

Admiral SYRING. Mr. Chairman, Ranking Member Cooper, thank you for the opportunity to appear today. Sir, I will submit my written statement for the record. In lieu of an opening statement, I request permission to play the video from the test last week.

Mr. ROGERS. We would love to see that.

[The video referred to is retained in the subcommittee files and can be viewed upon request.]

Admiral SYRING. And I will narrate as this goes, sir, since it is un-narrated, and give the committee an idea of what was accomplished last week.

The test was conducted on the 30th of May out in the Pacific. Here is a blue-water chart that depicts the test construct. The ground-based interceptor [GBI] was fired from Vandenberg Air Force Base. It was tracked by a TPY–2 on Wake Island and the SBX [Sea-based X-band Radar] in the northwest Pacific, giving the interceptor solution to Vandenberg to intercept a target launched from the Kwajalein Atoll in the Marshall Islands.

The red indicates the target fly-out, and the green indicates the GBI from Vandenberg.

Here is a picture from the target lifting off from the Kwajalein Atoll in the Marshall Islands, 5,000 miles away from the coast of California. This is the longest range target that we have ever flown, the highest altitude, and the highest closing velocity for an intercept, and this intercept was done with countermeasures.

Next, you will see a picture of the ground-based interceptor launch from Vandenberg Air Force Base out of a test silo that is completely production representative of the actual silos at Vandenberg, but this is what we test out of. The GBI is production representative of the CE–II Block 1s that will be fielded to fill out the 44 GBIs by the end of this calendar year.

What you will see next is an onboard sensor view of the kill vehicle, which is separated from the GBI, and what the kill vehicle saw in space. This is actual live data from the test.

What you see in red is the warhead from the target. And what you see in green is its tank that is flying alongside, because in space, everything flies at the same velocity. And you see the kill vehicle focused on the red warhead and eventually dropping out the other debris in the scene.

What you see next is the kill vehicle in acquisition and terminal, and that is an actual picture of the reentry vehicle that was destructed beyond recognition.

What you will see here is another infrared picture of the target booster and the target warhead with the booster of the GBI flying by literally a second before the kill vehicle killed the target warhead.

We had four or five different sensors strewn across the Pacific to validate what you just saw. That was not a simulation. That was actual live data played back from the test.

With that, sir, I stand ready for your questions.

[The prepared statement of Admiral Syring can be found in the Appendix on page 43.]

Mr. ROGERS. Outstanding. Thank you very much.

Lieutenant General Dickinson, you are recognized.

STATEMENT OF LTG JAMES H. DICKINSON, USA, COMMANDER, JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE, AND COMMANDER, U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/ARMY STRATEGIC FORCES COMMAND

General DICKINSON. Chairman Rogers, Ranking Member Cooper, and other distinguished members of the subcommittee, thank you for your continued support of our soldiers, civilians, and their families.

This is my initial appearance before this subcommittee, and it is, indeed, an honor to testify before you today to discuss the importance of missile defense to our Nation, and the need to maintain these capabilities in the face of a threat, as we all know, that continues to grow in both capacity and capability.

Today, I want to briefly summarize the missions of the organizations I represent. First, Space and Missile Defense Command or SMDC, Army Forces Strategic Command, ARSTRAT, which serve as a force provider in support of our combatant commanders.

Our six lines of effort are to, number one, protect the homeland; provide combat-ready space and missile defense professionals; plan, synchronize, and integrate global operations; produce or adopt leap-ahead concepts and technologies; preserve and account for the Nation's critical resources; and promote and foster a positive command climate.

Our six lines of effort apply not only to the missile defense, but also to Army space. The Army has more than 4,000 military and civilian space cadre that provide continuous space-based capabilities and support to the warfighter from 22 different locations and 11 different time zones around the world.

Within SMDC ARSTRAT, our future warfare center and technical center develops space and missile defense concepts, requirements, and doctrine; provide training to the Army space cadre, and missile defense operators; and executes space and missile defense research and development.

I also represent the Joint Force Component Command for Integrated Missile Defense, or JFCC IMD, which supports U.S. Strategic Command [STRATCOM} in integrating and synchronizing our global missile defense operations.

For example, today, we have approximately 300 full-time National Guard soldiers located in Colorado Springs, Colorado; Fort Greely, Alaska; and Vandenberg Air Force Base, California, who operate the ground-based missile defense system.

It represents the Nation's only defense against intercontinental ballistic missile attack. These trained and fully certified missile defense professionals execute a strategically important mission 24 hours a day, 7 days a week, 365 days a year. They refer to themselves as 300 soldiers protecting the 300 million.

Additionally, in support of U.S. STRATCOM, JFCC IMD executes the following key tasks: Synchronizing operational level planning; supporting ongoing operations; integrating training exercises; test activities globally; providing recommendations on the allocation of low-density, high-demand missile defense resources; and advocating for future capabilities.

As reported, the missile threat continues to grow, both in terms of numbers and sophistication. We as a Nation must maintain our current readiness posture and continue to increase our capabilities to address future threats.

Finally, I would like to highlight, the challenges we face today cannot be addressed without the dedication of our greatest asset: our people. Service members, civilians, contractors, and their families, those stationed at home, as well as those globally deployed provide support to the Army and joint warfighter each and every day.

We remain committed to providing trained and ready soldiers, civilians to operate and pursue advancements in space and missile defense capabilities for the Nation. This committee's continued support of missile defense operations and the men and women who develop and deploy our systems is essential.

Again, I appreciate the opportunity to discuss our Nation's missile defense capabilities, and I look forward to addressing your questions. Thank you.

[The prepared statement of General Dickinson can be found in the Appendix on page 73.]

Mr. ROGERS. Thank you.

Mr. Pike, you are recognized.

STATEMENT OF BARRY J. PIKE, PROGRAM EXECUTIVE OFFICER, ARMY MISSILES AND SPACE

Mr. PIKE. Thank you, sir.

Chairman Rogers, Ranking Member Cooper, and distinguished members of the subcommittee, I am honored to appear before you to testify on missile defense, and to thank you for your continued support of our people and our mission at Program Executive Office for Missiles and Space.

Support to our warfighters and their readiness remains our number one priority. I lead the materiel development, production, fielding, and sustainment support for assigned missile and space systems for the Army. This includes the centralized management of Army Air and Missile Defense, long-range precision fires, close combat, and aviation missile systems, as well as designated space programs.

In today's complex, dynamic, and volatile security environment, Army Air and Missile Defense is a key strategic enabler. As such, our focus continues to be on providing warfighting solutions to the Army combatant commands and their national partners across the operational spectrum.

We accomplish this by working closely with other military departments, the Missile Defense Agency, the Army Space and Missile Defense Command, to support joint integrated air and missile defense capabilities.

Mr. Chairman, Ranking Member Cooper, and members of the subcommittee, I look forward to addressing your questions.

[The prepared statement of Mr. Pike can be found in the Appendix on page 98.]

Mr. ROGERS. I thank all the witnesses for their statements, and I will recognize myself first for questions.

Admiral Syring, we have seen at least 78 ballistic missile tests by North Korea since Kim Jong-un came to power. More than 60 of these are assessed to be successes. It appears that he has had success with solid fuel ballistic missiles, including those launched by submarines and on the ground, and he may have recently shown that he can build a reentry vehicle and it can survive reentry.

In an unclassified setting, I have to ask: Does this budget request allow us to remain paced comfortably ahead of the threat; and secondly, if we fully fund your request, and it remains at the same level of funding, less than $8 billion a year, of which increasing amounts are procurement and O&M [operations and mainte-

nance], not research and development, will we continue to stay ahead of the threat, or is it moving faster than we are?

Admiral SYRING. Sir, with the work of this committee and others and the support of Congress, I would not say we are comfortably ahead of the threat. I would say we are addressing the threat that we know today. And the advancements in the last 6 months have caused great concern to me and others in the advancement of and demonstration of technology of ballistic missiles from North Korea.

It is incumbent upon us to assume that North Korea today can range the United States with an ICBM carrying a nuclear warhead. Everything that we are doing plans for that contingency, and in addition to looking ahead to what might be developed and what is possible over the next 5 to 10 years.

Mr. ROGERS. In an open setting, to the extent that you can, would you characterize what North Korea has been doing for the last 6 months?

Admiral SYRING. They have been not only testing at an alarming rate in violation of international law, but demonstrating technology that feeds development of longer-range missiles and more capable missiles as well.

Mr. ROGERS. Can you discuss your timeline for developing and deploying the LRDR [Long Range Discrimination Radar]. How long will the MDA take to do that and from requirement finalization to deployment?

Admiral SYRING. From the specific requirement of when LRDR was developed, it was back in 2014, and we were under contract in late 2015, if I get the timeline correct. And we will IOC [initial operating capability] it to the warfighter in late 2020.

Mr. ROGERS. Okay. With that, I will yield to the ranking member for his opening questions.

Mr. COOPER. Thank you, Mr. Chairman.

In view of the lateness of the hearing and the large number of subcommittee members who are here, I would defer my questions for the classified portion of the hearing.

Mr. ROGERS. The Chair now recognizes the gentleman from Arizona, Mr. Franks, for 5 minutes.

Mr. FRANKS. Well, thank you, Mr. Chairman.

And, Admiral Syring, everybody said it, but I just hope you know my name is on the list of those who honor and revere your commitment to this country and your service.

Admiral SYRING. It is my honor.

Mr. FRANKS. Admiral Syring, has MDA completed the inventory objective for both the SM–3 1B and the 2A?

Admiral SYRING. So there is not a stated inventory objective, but I know what the Navy is thinking it should be, and we are not close to that.

Mr. FRANKS. When do you think this objective or this—when do you think we could achieve that objective?

Admiral SYRING. At the production rate of—I will just—Mr. Franks, I will plan for 40 to 50 a year. It will be within the next 4 to 5 years.

Mr. FRANKS. You know, sometimes it is important for us to understand how much oversight MDA receives in the executive branch and legislative branches. Sometimes it is an enormous bur-

den on you. But I would like to just ask you to detail how many meetings, how many RFIs [requests for information], and how much paperwork is involved at MDA for these oversight processes.

Admiral SYRING. Can I give you a qualitative answer?

Mr. FRANKS. Yes, sir.

Admiral SYRING. A lot.

Mr. FRANKS. A lot, yeah.

Admiral SYRING. Sir, we are under a tremendous amount of oversight, and answer many questions from many different organizations on the development of missile defense technology and capability.

Mr. FRANKS. Well, given that it is a lot, for all of this work, how many recommendations did GAO [Government Accountability Office] have in its fiscal year 2016 report?

Admiral SYRING. There were three or four if you parse one. I will say four for the record.

Mr. FRANKS. And how many of those were validated by DOD [Department of Defense]?

Admiral SYRING. We didn't agree with three of the four.

Mr. FRANKS. Three of the four. So how about the fiscal year 2015 report. I am not going to pursue this much longer.

Admiral SYRING. I don't recall any recommendations, specific recommendations from that report.

Mr. FRANKS. So how much oversight would MDA have if we made the BMDS [Ballistic Missile Defense System] accountability report and the GAO mandate biannual and alternated when they were submitted? And how could the agency better focus on the mission if we did that?

Admiral SYRING. Sir, I want to just start by saying that, given the oversight responsibility, we have actually a constructive relationship with GAO. So I don't want to impugn GAO in any way. We work closely with them.

But to answer your question directly, I think a biannual report would be more than sufficient in terms of their oversight responsibility.

Mr. FRANKS. Well, let me shift gears on you here. How long do you think it will be before the GMD system has operational spares to ensure we maintain 44 GBIs at all times?

Admiral SYRING. Sir, it will be post-2020 when we have a Redesigned Kill Vehicle [RKV] available for procurement.

Mr. FRANKS. And I know you need to pull GBIs from the ground for the RKV recapitalization of the CE–1 interceptors. Is that correct?

Admiral SYRING. That is correct, sir.

Mr. FRANKS. How can we ensure that we don't fall below that 44 GBIs emplaced in the calendar year 2018?

Admiral SYRING. Sir, in fiscal year 2018, the Department made a downpayment on solving that problem with $150 million to go towards two silos and six boosters that would—two silos additionally up in Fort Greely.

And there will be a tail to that in fiscal year 2019 and out to complete that work. But the Department has taken steps to address that shortfall where if that were funded and supported by

Congress this year, and when the Department funds the tail, plans will be in place to not dip below 44 for any length of time.

Mr. FRANKS. So that means you will start buying GBIs again to add into our inventory when?

Admiral SYRING. We will buy boosters, sir, starting this year, and we will buy the silo materials starting this year as well.

Mr. FRANKS. Well, Mr. Chairman, that is all I have. Just, again, thank you for your service.

Admiral SYRING. Thank you, sir.

Mr. ROGERS. I thank the gentleman.

The Chair now recognizes the gentlelady from California, Mrs. Davis.

Mrs. DAVIS. Thank you, Mr. Chairman.

And I appreciate you all being here. This is one of the—I have been on this subcommittee now for a few months, and so I haven't had a chance to work with all of you.

I wonder if we could go back just to the GAO report for a second though, Admiral, because we have certainly focused on improving our acquisition strategies. There have been great concerns about that, as you well know.

And certainly, the GAO report that recently came out looking at 2016 suggested that the fact that you didn't agree with at least three of those recommendations was, you know, perhaps somewhat telling, and they were looking for more agreement with that.

So could you please share with us why, in fact, you weren't in agreement with at least three of those? And I know that they did overlap just to a certain extent. Could you speak to us a little bit about that, because, you know, we are trying to figure out why not implement some of those.

A lot of them had to do more with transparency, I believe. And the comments that were made were, well, you know, we will take a look at this but—you know, it was a little bit of a dismissal. Help us out with that, please.

Admiral SYRING. Ma'am, let me just—the history just quickly is, we in the past have, up to this point, have agreed with most, if not all of GAO recommendations. So it is not a matter of we have never agreed.

We just felt strongly, the Department felt strongly in a couple of different areas. One was the recommendation that the CAPE [Cost Assessment and Program Evaluation] approve acquisition strategies. The CAPE is a voting member on acquisition strategies to the Under Secretary of Defense for Acquisition, Technology, and Logistics so their vote is heard in that forum.

But the acquisition strategy approval is the responsibility of the former Mr. Kendall position in terms of approving acquisition strategies for not only me but other parts of the Department. And we, the Department, felt that that was not in the CAPE's area.

The other point, and I will just—the other example was on cost modeling and schedule modeling. We have a very detailed test schedule tool that we use to plan tests and to forecast tests. We also are—use a very detailed cost model to roll up test.

Where I would agree with one part of their assessment is that there is more fidelity that could be applied specifically in different parts of the test. But we, I think, have done a tremendous job

given the budgetary pressures, which has pressurized the test program, frankly, over the last 4 or 5 years in replanning and conducting tests.

I would note, ma'am, that they said that we—in fiscal year 2016, we delivered 100 percent of the capability that was planned. So those are just two areas I wouldn't say of firm disagreement, ma'am, but we had other methods to get at where their recommendation was coming at.

Mrs. DAVIS. So the fact that they may have said there were challenges in meeting the test schedule you think was perhaps——

Admiral SYRING. I recognize there is challenges every year in meeting the test schedule, and if there can be more fidelity applied to that process, we are certainly going to provide that.

Mrs. DAVIS. Thank you. I appreciate that.

And while we celebrate the tests that you shared with us, and I think we all really do feel good about that, I also know that it was somewhat under perfect conditions, if you will. You might want to challenge that, but I think that it was under better conditions than perhaps we would face under a crisis.

And so how do we really, I think, respond to the American people that are looking to see whether or not the dollars that are being spent under these endeavors compared to what we need to do in real-time deployment make sense?

Admiral SYRING. Ma'am, let me, if I can, just have a point of discussion on that. And I will then turn it over to General Dickinson, who is the warfighter responsible for the actual execution of the test, which the soldiers did.

We have to plan tests ahead of time. We have to announce tests ahead of time because of the air corridors that we go across. It was a 5,000-mile test, and we have got to clear the aircraft. We have got to clear the ships from the area. So there has to be a notification on when the test is going to be conducted.

The scenario that we conducted was actually an exact replica of the scenario that this country would face if North Korea were to fire a ballistic missile against the United States. We have TPY–2 radars in Japan, we have a radar in Alaska, and we have a homeland defense system in Alaska as well.

So what we did was move that scenario south and put a TPY–2 on Wake Island, a Sea-based X-band Radar northwest of Hawaii, and shot an interceptor out of Vandenberg, which just, you know, 1,000 or 2,000 miles south replicated what the warfighter would face in real time.

The scenario was executed by warfighters on console. And the way the information flowed after the launch of the target is exactly the same way the information would flow upon a launch of a North Korean ballistic missile.

It would be detected by the overhead sensors, pass it to the radars in Japan, pass it to the radar in Alaska, develop the weapons task plan to the interceptor in Alaska to shoot an interceptor to defeat that threat. I would actually argue the scenario that we conducted was maybe more operationally realistic than not. We only fired——

Mr. ROGERS. The gentlelady's time has expired.

Admiral SYRING. We only fired one interceptor, and the warfighter in a real-world scenario would fire more than one.

Mr. ROGERS. We are going to have to try to get a classified briefing in before we get called for votes again. I am going to try to keep everybody on schedule.

The gentleman from California, Mr. Hunter, is recognized.

Mr. HUNTER. Thank you, Mr. Chairman.

So let's go to Hawaii. And first, I think this is the existential threat that America faces right now, and you are dealing with it. You are doing God's work. So let's talk about Hawaii.

Let's see, does the program that you are talking about—you asked for $21 million for a new Hawaii ballistic missile defense radar, medium-ranged discriminating radar, or the equivalent by 2021? Does what you are talking about—is that what you are going to have there as supposed to just the SBX?

Admiral SYRING. Yes, sir.

Mr. HUNTER. Okay. Second question: Have you looked at—and I know other people have, so specifically MDA, have you looked at using SM–3 Block 2s for the North Korean missile threat?

Admiral SYRING. Yes, sir, we have done the analysis and looked at that extensively. We have not tested it yet.

Mr. HUNTER. Can you speak to that now or we have to wait until the next hearing?

Admiral SYRING. I can speak to it, sir. There is an inherent capability in the SM–3 2A to engage longer-range threats in terms of what we believe the design space is. We have not tested against that longer-range threat, but analysis indicates that that could add another layer of defense to Hawaii.

Mr. HUNTER. Okay. In that video, where were you shooting at in the U.S.? Like, where was the target?

Admiral SYRING. The target was on Meck Island in the Kwajalein Atoll, in the Marshall Islands, and the interceptor was fired from Vandenberg in L.A.

Mr. HUNTER. I was saying, where were you aiming the fake ICBM at in the U.S.?

Admiral SYRING. It was going towards the West Coast.

Mr. HUNTER. Towards like San Diego or Los Angeles or something?

Admiral SYRING. I won't say San Diego.

Mr. HUNTER. Okay. How high would it have to be for Alaska to pick that up and not the SBX?

Admiral SYRING. If you would have translated that scenario north, that scenario would have been picked up by the Alaska radar.

Mr. HUNTER. Like San Francisco or higher or something?

Admiral SYRING. Sir, the construct that I described protects the entire continental United States.

Mr. HUNTER. Gotcha. Okay. So let's go to the SBX. In 2020, it is going to have to go dry dock, right?

Admiral SYRING. Yes, sir.

Mr. HUNTER. So you are talking about building an actual radar on Kauai, right, to——

Admiral SYRING. In the State of Hawaii.

Mr. HUNTER. Okay. So not the Pacific Missile Range Facility?

Admiral SYRING. That is one option. We haven't decided on location. There is six or seven different locations we are looking at.

Mr. HUNTER. Does the Navy not want to do it at the Pacific Missile Range Facility [PMRF]?

Admiral SYRING. Sir, the Navy completely understands the need for the radar, and we are working closely with them on what operational restrictions would have to be in place at PMRF.

Mr. HUNTER. But you basically have to have this done by 2020, right?

Admiral SYRING. We do.

Mr. HUNTER. Okay. So, I guess, my next question is, if you do it anywhere in Hawaii, the Pacific Missile Range Facility excluded, are you going to have to go through an environmental impact study [EIS]?

Admiral SYRING. Yes, potentially, yes, sir.

Mr. HUNTER. Sir, an actual environmental impact study. I am from California. I mean, you know, Camp Pendleton was basically closed down to Marine Corps assault from the ocean because of fairy shrimp in the sand, where they did an assault then walked on the hardball around the actual beach. Then they could proceed with their assault.

Do you think you have the right timeframe in mind if you have to do an EIS?

Admiral SYRING. The timeframe with an EIS would be challenging.

Mr. HUNTER. Is there any way to get around doing an EIS?

Admiral SYRING. For reasons of national security.

Mr. HUNTER. And then you would do an environmental assessment?

Admiral SYRING. Correct.

Mr. HUNTER. And that comes from OSD [Office of Secretary of Defense]?

Admiral SYRING. That is correct.

Mr. HUNTER. Okay. So you could say—because of national security and pressing existential threat to the United States reasons, we can bypass that?

Admiral SYRING. That is my recollection of the options we have, but——

Mr. HUNTER. Do you have to use an EIS if you go on PMRF?

Admiral SYRING. Let me take that for the record, sir.

Mr. HUNTER. Okay. The answer is yes? Yes, okay. The answer is yes. We got it.

Okay. Last thing is, your MILCON [military construction] budget request for the radar that will be in place before the SBX has to go in the dry dock, you have a date of 2021, yet you have a planned IOC date of 2023, assuming a fully installed, integrated, and tested system.

The question is, how does this timeframe from initiation of MILCON to initial operational capability compare to, like, the LRDR?

Admiral SYRING. Very similar.

Mr. HUNTER. Okay. So you are happy with the timeframe of the SBX going away, which is what you used for this test, the SBX

going away and you having a medium-range radar in place on the ground in Hawaii to take its place?

Admiral SYRING. Sir, I would just offer a little different perspective. SBX, in my opinion, will not go away in 2020. It has got to go into a dry dock and we have got to manage that operational risk. But the decision for SBX to go away will be both the NORTHCOM [Northern Command] and the PACOM [Pacific Command] commanders' call.

Mr. HUNTER. So you could press that off or they could press that off if they had to by a year or two?

Admiral SYRING. Absolutely.

Mr. HUNTER. I gotcha. Okay. Thank you. Thank you, Mr. Chairman. Thank you.

Mr. ROGERS. The gentleman's time has expired.

The Chair now recognizes the gentleman from Texas, Mr. O'Rourke, for 5 minutes.

Mr. O'ROURKE. Thank you, Mr. Chairman.

Admiral Syring, I appreciate being able to see the video. That was incredibly helpful to understand what we are talking about. Can you talk about—we obviously saw a success in the ICBM being destroyed. Can you talk about any concerns you have with the performance that you can share in this session?

Admiral SYRING. Yes, sir. This—in no way should the committee take away that this is the final step and we are stepping away declaring success. We have been on a journey over the last at least 5 to 6 years to improve the reliability of the entire system.

Sir, as you know, the system was fielded very rapidly back in the early 2000s without a proper system engineering cycle or production engineering cycle because of what the President deemed—and correctly so—that some defense now is better than no defense.

What was said back then was, we need to work to improve the system over time. And I have stated openly in this committee and others that I have reliability concerns with the system that have been systematically addressed, in large part, over the last, I will say, 6 years, bit by bit. It is just not the interceptors. It is the entire system.

We are not there yet. We have continued work with the Redesigned Kill Vehicle. We have continued work with the reliability of the other components of the system to make it totally reliable to give the warfighter options on shot doctrine in the future. I have been very open about that, that we are not done yet.

Mr. O'ROURKE. Let me ask you about that. The President has talked about an expanded missile defense system. You have talked about, in response to one of the questions, that—if I could characterize your answer, we may be keeping pace with the threats, but perhaps not as quickly or as effectively as you would ideally like.

What did the President mean by expanding missile defense systems? Is the video you showed us, does that satisfy his interests in expansion?

Admiral SYRING. Sir, I don't know. I have not talked to the President specifically about this. But I do know that the Ballistic Missile Defense Review that he has chartered, the Secretary of Defense has chartered, will look at this exact question in terms of not only

the capability of the current interceptors, but the capacity question, and do we need more and where do we need more.

Mr. O'ROURKE. Let me ask you this question, and forgive the ignorance in the question. I am also new to this subcommittee. How good can we get at missile defense, not speaking technologically, but in terms of either treaty obligations or concerns about upsetting any balance or deterrence considerations that we already have?

Admiral SYRING. Sir, if I can, I will give you my perspective as a military officer and then I will hand it to my policy friend, Mr. Harvey, to expand further. But I got asked that question a couple weeks ago about missile defense being destabilizing, and my answer to that was the only thing provocative and destabilizing are North Korea's actions.

Mr. O'ROURKE. What about with Russia, I guess, I am specifically asking about?

Admiral SYRING. I will let Mr. Harvey take that.

Mr. HARVEY. So as you know, you alluded to, I mean, the Russians have expressed concerns about our missile defense capabilities. I think we have, for the past 50 years, recognized deterrence as sort of the basis for strategic stability in terms of defense of our homeland.

In terms of defense of our forces in a regional context, I think to the extent that the Russians pose a threat to those forces, that we feel we have not just a right but an obligation to provide the defenses that we need to protect those forces, and we won't let ourselves be cowed by complaints or threats or accusations from the Russians.

Mr. O'ROURKE. And I am not suggesting that we should. I think I am just trying to get an understanding of the parameter of how far we can take this within current considerations. It may be a question for a longer conversation. Perhaps on the same theme, how effective are Russian missile defense systems comparable to ours?

Admiral SYRING. Sir, if I could take that to the classified session.

Mr. O'ROURKE. Okay. I will have that same question for other countries too.

Admiral SYRING. I will feel more comfortable.

Mr. O'ROURKE. Thank you. Thank you, Mr. Chairman. I yield back.

Mr. ROGERS. The Chair now recognizes the gentleman from Alabama, Mr. Brooks, for 5 minutes.

Mr. BROOKS. Thank you, Mr. Chairman.

Admiral Syring, I understand that the Missile Defense Agency and the DOD Director of Operational Tests and Evaluation both agree that a multiyear procurement of the SM–3 would make sense, and given common components, that adding a multiyear procurement of SM–6 may also make sense. Is that right or is that wrong?

Admiral SYRING. I agree with that assessment.

Mr. BROOKS. Why?

Admiral SYRING. One, the two interceptors are manufactured in the same location. There must be synergies between the two production lines. We have proven on the Navy side—I will speak for

the Navy—very, very successful track record with SM–6 testing. And its technical baseline is mature enough, it is absolutely supportive of a multiyear.

The SM–3 1B will go through its final intercept testing as part of Formidable Shield 17 in the September, October timeframe. And we are confident that given that test, both the SM–3 and the SM–6 will be ready for the Department to certify multiyear procurement, at least that will be my recommendation.

Mr. BROOKS. Next question. Please describe the joint emergent operational needs submitted by U.S. Forces Korea, Commander Brooks, in February this year. I understand it has been endorsed by Admiral Harris at the Pacific Command. Is that correct or incorrect?

Admiral SYRING. That is correct, sir.

Mr. BROOKS. And what is the plan to provide this capability to the commander of U.S. Forces Korea? Will you or your successor seek a reprogramming to accomplish this effort, or have you included it in your budget request for fiscal year 2018?

Admiral SYRING. Sir, it is an emerging capability. I just returned from Korea last night talking about the document and potential material solutions, and I would defer that discussion given the environment to the classified environment.

Mr. BROOKS. And this next question is for any witness who would like to pick it up. The Ground-Based Midcourse Defense system in Alaska and California is the missile defense system that protects the United States from long-range ballistic missile attacks.

Should the American people have confidence in its ability to defend the United States?

General DICKINSON. Congressman Brooks, the American public should have absolute confidence in it. I have confidence in the soldiers that man and operate the system; I have confidence in the system itself; and I have got great confidence in the relationship we have with the material developer, Admiral Syring, and MDA in that regard, but absolute confidence.

Mr. BROOKS. Given that North Korea seems to also be advancing both their capabilities and perhaps numbers of missiles, do you have a judgment as to whether we will be ahead of the game in 2020?

General DICKINSON. I think at this point we will, given the current program of record—and I will defer to Admiral Syring to talk about it—and what the capabilities are that we are progressing with, I think we will likely be.

Admiral SYRING. Sir, I would answer and add that everything that this committee has supported over the last 4 years has been targeted towards a near-term, which is now part of the program of record and fielded set of capabilities, a midterm and a far-term capability, midterm defined by 2020.

Everything that we are working on and fielding is to stay ahead of the threat by 2020. Today, we are ahead. We need to stay ahead. Where I just want to put one caveat in is on capacity. And certainly, the censoring and discrimination work that we have done to improve the capability of the system is on a trajectory, and, in large part, fielded.

Where we need to be prudent and constantly vigilant on is what is the capacity increase that we can expect from North Korea and what is our capacity needed to meet that threat. And I can assure you, sir, as part of the BMDR, all of that analysis and intelligence estimates will be balanced to come up with a recommendation from the Department.

Mr. BROOKS. Well, it seems that we have protection with our facilities in Alaska and California. Do you have a judgment as to whether we need similar facilities or capabilities on the East Coast?

Admiral SYRING. Sir, that will be part of the Department's assessment over the next 180 days.

Mr. BROOKS. Thank you, gentlemen. Mr. Chairman, I yield back.

Mr. ROGERS. I thank the gentleman.

The Chair now recognizes the gentleman from New Jersey, Mr. Norcross, for 5 minutes.

Mr. NORCROSS. Thank you, Mr. Chairman.

And there is a couple of items I want to follow up on from my colleagues. The SM–3 missile, been tested considerably, but had a few issues not too long ago. And then I understand we got out of the penalty box, and it is now tested. Do you have any concerns about the reliability?

Admiral SYRING. No, sir, none whatsoever.

Mr. NORCROSS. So if we were able to identify additional resources, would you support or do you need additional missiles and by what year?

Admiral SYRING. Sir, I will give you the answer. The President's budget was the best balance of resources at the time at the top line. But the answer to the multiyear question from Mr. Brooks is that my testimony is that the technical baseline for the SM–3 is stable and ready for multiyear procurement and additional procurement quantities if required.

Mr. NORCROSS. So you are comfortable with the timeframe that has been laid out?

Admiral SYRING. Yes, sir. This will be, once again, a BMDR but Department decision for fiscal year 2019, but it will be my strong recommendation that it is ready for a multiyear procurement.

Mr. NORCROSS. And we certainly understand what happens today doesn't necessarily keep us from changing tomorrow. The dry-docking of the SBX, my understanding, we will always have opportunities to extend this out. Is a 2-year timeframe comfortable, or can we go beyond that in the event that other technical issues pop up?

Admiral SYRING. Sir, we can work with the operators and the Military Sealift Command in terms of what risk they are willing to accept. And we will do underwater hull surveys and everything else to assess the life of, you know, basically how is the vessel doing.

There can be ways to not only take risk on when that dry dock appears, or is conducted with periodic maintenance that can be done during the import periods short of a full dry dock.

Mr. NORCROSS. Do you have the resources available to you to extend that out? Because I would rather have the extension and not use it.

Admiral SYRING. Sir, that would be in 2020 and beyond, and, certainly, well before then we will factor that into the President's budget request if required. It will be based on how the Hawaii radar is progressing, you know, the fielding of the Alaska radar. And I can assure you that won't be my decision. It will be the combatant commanders' decisions.

Mr. NORCROSS. And I will reserve the rest for closed session. I yield back.

Mr. ROGERS. I thank the gentleman.

The Chair now recognizes the gentleman from Colorado, Mr. Lamborn, for 5 minutes.

Mr. LAMBORN. Thank you, Mr. Chairman.

And, Admiral Syring, I want to thank you for your service to our country and your great work at MDA.

Admiral SYRING. My honor.

Mr. LAMBORN. You will be missed. But thank you for what you have done.

The kinetic kill test result that you showed us earlier is both wonderful and gratifying, and I really was happy to see it. Now, looking forward to the future for future progress in boost phase kill, I think we have to look at directed energy.

And MDA, in the last few years, has made some modest but steady investments in directed energy. Now, as the missile threats to our country grow and as the geopolitical situation evolves, and there are some dangers out there, I really see that we need to be stepping up our directed energy investments.

But I am dismayed when I look at this budget that we have been—we are cutting $50 million in this year's request for directed energy research and development. So how do we square that with the needs and threats that are out there?

Admiral SYRING. Yes, sir.

The premise of the budget submission at the Department level with directed energy was to pull directed energy funding across the Department towards common solutions and common maturation of technology. That is why we saw a reduction in the MDA budget.

That said, we owe the plan to not just the Department, but we owe the plan to the Congress on how are we going to do that to continue the development of directed energy. I agree with you 100 percent that boost phase defense and directed energy should be pursued vigorously and without delay. And I assure you, as part of the BMDR, the Department will look at directed energy in depth for missile defense and assess that recommendation.

Mr. LAMBORN. Okay. Would you appreciate this committee reviewing that part of the budget and scrutinizing it very carefully?

Admiral SYRING. Sir, as you are entitled to with congressional oversight, of course.

Mr. LAMBORN. Okay. Excellent.

Now, shifting gears, what can you tell us in open hearing about the Iranian threat and our efforts in Europe with sensors and radar and interceptors to deal with that threat given the fact that we don't have an East Coast site as of yet?

Admiral SYRING. I would—let me be very careful here. I would put in perspective, first, the threat piece of Iran versus North Korea. There is no comparison in terms of the amount of testing

that we have seen with North Korea, both in range and capability to what we have seen in Iran over the last 6 to 8 months. It is night and day.

So our priorities on focusing towards a North Korea threat have been exactly right. That said, we cannot forget about Iran and what they are capable of doing in terms of longer-range space launch vehicle technology and shorter-range missiles that they possess, both land-based and anti-ship ballistic missiles as well.

We, as part of the BMDR, need to look both ways when we assess our capacity on where the capacity is located, both in Vandenberg and Alaska, and what a potential East Coast site could bring in terms of not only numbers, but battle space to the warfighter and shoot-assess-shoot opportunities with the right assessment capability to go along with it.

Mr. LAMBORN. Okay. Thank you very much. I appreciate your service once again. And I yield back.

Mr. ROGERS. I thank the gentleman.

Admiral, to be clear, was it your best military judgment that funding be cut for fiscal year 2018 on directed energy?

Admiral SYRING. No, sir, that was not my best military advice.

Mr. ROGERS. Thank you.

The Chair now recognizes the gentlelady from Hawaii, Ms. Hanabusa, for 5 minutes.

Ms. HANABUSA. Thank you, Mr. Chair.

Admiral Syring, I just would like to get an orientation here. So from the time—if you can say this in open session, from the time the ICBM was launched from Kwajalein, how long was it before the Vandenberg interceptor was launched?

Admiral SYRING. About 10 minutes.

Ms. HANABUSA. Then can you tell me where exactly did they intercept? Was it like close to Hawaii? Closer to the West Coast? Closer to the point?

Admiral SYRING. It was about 2,000 miles west of California, but further to the north of Hawaii.

Ms. HANABUSA. And when the test was done, and the interception took place, was it always anticipated that that would be the route that more than likely, I assume, that a missile, if launched from Korea, North Korea would take? That was basically the assumption made?

Admiral SYRING. Yes, ma'am, in terms of being able to replicate the operational architecture down on the test range, which we did.

Ms. HANABUSA. Now, one of the things that also—in your statement, you talked about the radar, I think, homeland something radar—I don't know what the whole acronym was—for Hawaii. Now, assuming that that radar is in the 2018 NDAA and then appropriated accordingly, how long is it expected for that radar to actually be built?

Admiral SYRING. If the funding is authorized and appropriated, we would then immediately do the aforementioned site surveys and finalize a site and the aforementioned environmental impact study in parallel to prepare for a competition industry-wide for procurement of that radar.

And to answer your question, we were counting on 2 years for that to happen. And the reason I was hedging on the environmental study is that sometimes that can take longer than that.

Ms. HANABUSA. And though a lot of people assume that PMRF on the island of Kauai is probably the most logical place, I assume that there are criteria which may place it somewhere else, and that is why your response was as your response. I mean, we have eight islands, and I am assuming that you are looking at more than just Kauai as a site?

Admiral SYRING. We are, yes, ma'am.

Ms. HANABUSA. The other thing is, in your statement, you speak to the fact that—if I can find it—that the Pacific architecture, the increase of defensive capability of the GBIs for the enhanced defense of Hawaii. Now, the GBIs are the ground-based interceptors. So when you say the enhanced GBIs for Hawaii's defense, what exactly do you mean by that?

Admiral SYRING. I am sorry for the acronyms in the descriptors, but we talk about the GBIs as capability enhancements. Roughly, the first 20 GBIs, which are the oldest GBIs, are referred to as Capability Enhancement I's; Capability Enhancement-II's were, for simplicity sake, comprised the next 10; and then Capability Enhancement-II Block 1 comprised the balance of the 44.

So the Capability Enhancement-II Block 1, which was tested, is the very latest GBI configuration which will be fielded before the end of the year.

Ms. HANABUSA. If I recall the testimony correctly though, the 44 is Alaska and Vandenberg.

Admiral SYRING. That is correct.

Ms. HANABUSA. That is correct, right?

Admiral SYRING. Yes, ma'am.

Ms. HANABUSA. So when you talk about the capability of GBIs for enhanced defense of Hawaii, you are talking about Hawaii being defended from those locations?

Admiral SYRING. From Alaska, yes, ma'am.

Ms. HANABUSA. And I think that is one of the things that people don't seem to realize is that some people are under the impression—and if you can respond, I would appreciate it—that somehow Kauai is the best vantage point to really protect the Hawaiian Islands. But in actuality, it is my understanding that it may not be the best location, that it is either north of Kauai or some other location like Alaska or Vandenberg, maybe, that would be the better location because of where an ICBM would track. Would that be correct?

Admiral SYRING. Yes, ma'am, for GBIs at Alaska that would not be a—that would certainly not be a recommendation of mine. I mean, GBIs in Hawaii would not be a recommendation of mine. Now, the defense that we get from Alaska in a orthogonal, or a crossing trajectory, is very good in defending Hawaii today.

Ms. HANABUSA. Thank you. Thank you very much. Mr. Chair, I yield back.

Mr. ROGERS. I thank the gentlelady.

The Chair now recognizes the gentlelady from Wyoming, Ms. Cheney, for 5 minutes.

Ms. CHENEY. Thank you very much, Mr. Chairman. And thank you as well to all of our witnesses for your service and for being here today.

Admiral Syring, there has been some conversations and discussion about strategic stability, which is a crucial issue. But I think it is important to note that it is not the United States that is violating arms control treaties or talking about escalate to win. That is Russia.

And isn't it also the case that we are not building missile defenses to counter Russia's strategic or theater nuclear capabilities?

Admiral SYRING. That is correct, ma'am.

Ms. CHENEY. But isn't Russia, in fact, doing that to us basically? Russia—isn't it, in fact, the case that Russia has got several dozen nuclear-armed interceptors in their missile defense portfolio——

Admiral SYRING. Yes, ma'am.

Ms. CHENEY [continuing]. That are particularly aimed at attempting to defeat, you know, any potential U.S. nuclear attack?

Admiral SYRING. I can answer that in the classified session, yes, ma'am.

Ms. CHENEY. All right. And hasn't China also been developing ballistic missile defenses with an intent to counter our offensive weapons?

Admiral SYRING. There have been developments in that area.

Ms. CHENEY. And so when we hear China and Russia talk about the United States upsetting strategic stability, isn't that, in fact, somewhat hypocritical?

Admiral SYRING. In my opinion, yes.

Ms. CHENEY. And then a question for all of the witnesses. At a May hearing of the Senate Intelligence Committee, when asked whether Russia is using active measures to undermine U.S. nuclear modernization and missile defense efforts, the Director of Central Intelligence stated on the public record, "Yes, they are."

So I would like to ask all of the witnesses on the record, do you agree with this assessment? And start with you, Mr. Pike.

Mr. PIKE. I don't know that I have any firsthand knowledge of that, ma'am.

General DICKINSON. Ma'am, I have not seen that or have firsthand knowledge of it.

Admiral SYRING. Ma'am, me neither at this point. I can't comment.

Ms. CHENEY. Okay. Thank you.

Mr. HARVEY. I share the position of the other panel members.

Ms. CHENEY. All right. In the event that the Director of Central Intelligence is accurate and is correct in his assessment, wouldn't it be the case that you would agree this is not something that we could let stand, that we can't allow the Russians to undermine our defense programs?

Mr. HARVEY. Absolutely.

Admiral SYRING. Yes, ma'am.

General DICKINSON. Yes.

Mr. PIKE. Concur.

Ms. CHENEY. Thank you. Thank you very much. Mr. Chairman, I yield back.

Mr. ROGERS. I thank the gentlelady.

The Chair now recognizes the gentleman from Colorado, Mr. Coffman.

Mr. COFFMAN. Thank you, Mr. Chairman.

One question I have is that this successful test that we just did, in your view—and whoever would like to answer this—what impact do you think it has on the North Korean regime in terms of the development of their program? Does it send them a clear signal about the intent of the U.S., United States, in order to defeat their capability?

Mr. HARVEY. I don't think we can rely on sort of the rational reaction of Kim Jong-un, the North Korean regime. That is why, I think, we need to continue to make improvements to our GMD system so that we can provide protection and not give him or his regime an opening to exploit weakness and use that to his advantage.

Admiral SYRING. I would just add that I think it validates that, if called upon, the warfighter called upon to operate the system in a real-world scenario, that I have confidence that they would do that entirely. And what message it sends to North Korea, I have no idea, but I know what message it sends to the American people, in that we can defend them 24 hours a day, 7 days a week.

General DICKINSON. I agree with that statement in terms of the demonstration that we have the warfighters that are prepared and trained to do that 24/7/365. And I can't speak for what his reaction would be, but it clearly does demonstrate that we have the capability.

Mr. COFFMAN. In this open session, can you say anything about the work that we are doing with Israel in terms of missile defense? I think that there is some talk about doing a joint test on the Arrow system.

Admiral SYRING. Yes, sir. We are close partners with Israel on development of their systems, system engineering in particular, and testing support also.

And I have been intimately involved with them on David's Sling and Arrow, the more recent version of Arrow 3. And, frankly, that interceptor is now up into the exoatmosphere, and it has significant range constraints within the Mediterranean.

And one of the better places to test is in Alaska, from Kodiak, and we plan to do that next year.

Mr. COFFMAN. Okay. So the Arrow 3 is designed to defeat the over-the-horizon capability of the Iranians. Am I correct in that?

Admiral SYRING. Sir, it is designed to defeat the exoatmospheric ballistic missile threat from Iran.

Mr. COFFMAN. Okay. And where are we at in terms of the deployment of that system?

Admiral SYRING. It is in testing, and I don't have the specific IOC thinking from the Israelis, but I can get that to you for the record.

[The information referred to was not available at the time of printing.]

Mr. COFFMAN. Okay. Thank you. Can you basically state what China's concern is with the deployment of the THAAD system in South Korea?

Admiral SYRING. Sir, I would like to, if I can——

Mr. COFFMAN. Sure.

Admiral SYRING [continuing]. Relay that to my policy peer.

Mr. COFFMAN. Mr. Harvey.

Mr. HARVEY. I think they have expressed a concern about the ability of the radar system to track any missiles that might be launched from China, and what that says or what that exposes in terms of vulnerability to their systems. So I think that is a concern.

Mr. COFFMAN. Thank you. Thank you, Mr. Chairman. I yield back

Mr. ROGERS. I thank the gentleman. Before we move to the classified portion, I want to touch one topic.

Admiral Syring, can you explain why we are building Aegis Ashore sites in Poland and Romania that do not meet the same requirements for housing of our sailors? As you know, because I met you at the Poland site when I led a CODEL [congressional delegation] a couple months ago, in the Polish site, which is coming out of the ground, sailors would be housed four to a room; whereas, on the Romanian site, which we have just completed, it is two to a room. And by the way, that site turned out wonderfully. It really is first-class.

Who made this decision and why?

Admiral SYRING. Sir, the timeline that I understand is the former CNO [Chief of Naval Operations] directed that the site be fully capable but austere in its construction and nature for housing. And they didn't have a definition of austere at the time when the budget was submitted for Romania.

The unified facilities code from DOD grappled with what is the definition of austere and came out with that guidance in 2013, which formed the basis for the Poland military construction request.

It is not a satisfying answer, but that is the timeline.

Mr. ROGERS. Well, does this make sense to you? And what does it mean for morale, given that we are going to save less than 2 percent of the cost on this side at the Poland construction?

Admiral SYRING. From the Navy standpoint, I can't speak to that, but certainly the message is being sent to the sailors in Poland versus the sailors in Romania that it is different.

Mr. ROGERS. And it is inexplicable and indefensible.

With that, we will recess and go into a classified setting now.

[Whereupon, at 4:00 p.m., the subcommittee proceeded in closed session.]

A P P E N D I X

JUNE 7, 2017

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

JUNE 7, 2017

Opening Statement of Chairman Rogers
Hearing on
"Fiscal Year 2018 Budget Request for Missile Defeat Programs and Activities"

June 7, 2017

Good afternoon. I would like to welcome everyone to our hearing this afternoon, "Fiscal Year 2018 Priorities and Posture of Missile Defeat Programs and Activities."

We have an esteemed group of witnesses with us this afternoon, they are:

- Mr. Todd Harvey
  Acting Assistant Secretary of Defense for Strategy, Plans, and Capabilities

- Vice Admiral James Syring, USN
  Director, Missile Defense Agency

- Lieutenant General James Dickinson, USA
  Commander, Joint Functional Component Command for Integrated Missile Defense; and Commander, US Army Space and Missile Defense Command/Army Strategic Forces Command

- Mr. Barry Pike
  Program Executive Officer, Army Missiles and Space

Before I begin, I would like to take the Chairman's prerogative for a minute.

For almost 37 years, Vice Admiral Syring has served his country in uniform.

Members of this subcommittee are most familiar with him as Director of the Missile Defense Agency, which he has led since November 2012.

I remember the problems with the prior leadership of MDA, and the devastating impact on its morale, back in 2012. That has all changed under Admiral Syring's leadership.

I think there's no better testament to his service and leadership than the recent Ground-based Midcourse Defense System test against an ICBM-class target.

With everything that's going on in the world, this success sends a powerful, and unmistakable, signal to allies and adversaries alike that we will defend ourselves from ballistic missile attack and threat of attack.

Admiral Syring, we thank you for your service and very much hope it isn't yet complete.

Now, we are here today to examine the budget request of the Department of Defense for ballistic and cruise missile defense and missile defeat programs.

Since Kim Jong Un took power in 2012, North Korea has conducted 78 ballistic missile tests, of which 61 are considered to be successful.

We have seen successful tests of solid fueled submarine-launched and ground-launched missiles, missiles that have flown to longer ranges than ever before, and, recently, press reporting suggests North Korea may have survived a re-entry vehicle.

So, the question more than ever, and more importantly than ever, is: are we properly resourcing our ballistic missile efforts and are we prioritizing the right programs the right way?

The President made clear during the campaign that he wanted to build a "state of the art" ballistic missile defense.

But his budget request actually would spend less than Congress enacted in fiscal year 2017.

We need to do better if we are to accomplish the goal the President set out, which I believe we must.

This is the challenge before us as we move to mark-up the FY18 National Defense Authorization Act.

I now recognize my good friend from Tennessee, for any opening remarks he might wish to make.

Jim, let me suggest "Roll Tide".

Opening Statement
The Honorable Jim Cooper
Hearing: Fiscal Year 2018 Priorities and Posture of Missile Defeat Programs and Activities

June 7, 2017

I join Chairman Rogers in welcoming our witnesses today.

Effective missile defense for the United States and its allies remain important as the threat from North Korea continues to grow. North Korea's nuclear weapons tests and missile tests, which make headlines nearly every few weeks now, pose a threat to the United States and its allies in the region.

The administration has begun a Missile Defense Review that will determine what investments or changes in policy are needed. In the meantime, the Missile Defense Agency continues to progress on a number of important programs, including the Redesigned Kill Vehicle and the Long-Range Discrimination Radar, that will improve reliability and discrimination. I also support modernization of the Patriot system and I am hopeful that the Department of Defense can purchase a new radar very soon.

I note the FY18 Trump budget request is more or less equal with the funding levels of last year's missile defense budget. I look forward to hearing the witnesses priorities for FY18.

We must also be mindful to focus on technologies that are feasible, rather than expensive pie-in-the-sky technologies that could siphon funding from workable, practical missile defense itself and other defense priorities.

And I remain concerned about congressionally-mandated changes that undermine strategic stability and exacerbate a potential nuclear arms race with Russia and China. Making policy changes that divide NATO or that lead Russia and China to more heavily invest in new or more numerous nuclear weapons to threaten the United States and our allies weakens our security.

We need sound investments that enhance our national security. I trust this is a bipartisan goal.

I would especially like to congratulate Admiral Syring as he is departing the Missile Defense Agency. We thank you for your decades of service to America, and for your candid advice and insights.

Not for Public Release until Approved by the

House Armed Services Committee

STATEMENT OF

THOMAS H. HARVEY III

ACTING ASSISTANT SECRETARY OF DEFENSE

FOR STRATEGY, PLANS, AND CAPABILITIES

BEFORE THE HOUSE

ARMED SERVICES

SUBCOMMITTEE ON STRATEGIC FORCES

June 7, 2017

Chairman Rogers, Ranking Member Cooper, Members of the Subcommittee, thank you for the opportunity to testify on priorities and posture of missile defeat programs and activities and the Defense Department's continuing efforts to sustain and modernize our homeland missile defense capability so that we remain ahead of the threat while providing effective, integrated, and interoperable regional ballistic missile defense (BMD) capability. I am grateful for your consistent attention to, and continuing support of, the critical mission of defending the homeland, our deployed forces, and our allies and partners, and from a growing ballistic missile threat.

On January 27, 2017, President Trump directed that the Secretary of Defense initiate a new BMD Review to identify methods of strengthening missile defense capabilities to address rapidly growing missile threats. The BMDR will be informed by the President's desire to develop a state-of-the-art missile defense system to defend the homeland and our regional interests against the threat of missile attack. During this review, we will examine a broad range of issues to ensure that we are fielding the appropriate weapons systems in the appropriate quantities to protect the United States, our deployed forces, and our allies and partners against increasingly sophisticated missile threats from across the globe. We expect to complete the BMDR in the in the fall timeframe. We will be working on the FY 2017 NDAA-directed Missile Defeat Report simultaneously, of which many of the requirements overlap. Issues that do not will be submitted separately.

I will begin with a discussion of ballistic missile threats and other missile trends, and then focus on several key policy priorities: defending the United States against long-range ballistic missile attacks, strengthening defense against regional missile threats, fostering defense cooperation with allies and partners, and examining how to advance the missile defense technology base in a cost-effective manner. I will also address briefly issues associated with other non-BMD tools the Department is examining to assist in the broader effort to defeat ballistic missiles.

Ballistic Missile Threats

Ballistic missiles continue to pose a significant security challenge as nations pursue efforts to make them more survivable, reliable, mobile, and accurate at greater ranges.

North Korea

North Korea's weapons and missile programs pose a growing threat to the United States and to our allies and partners in East Asia. Over the last year, North Korea has conducted its fourth and fifth nuclear tests and an unprecedented number of ballistic missile tests. Although many of these missile tests have not been successful by U.S. standards, the North Koreans appear to be learning from these failures. North Korea also seeks greater capability through diversification of its ballistic missile program and creating more survivable delivery systems. It has paraded and test launched a variety of missile types from land, road mobile, and submarine based platforms. It also has continued the development of longer-range ballistic missiles, including its Musudan intermediate range ballistic missile it test launched multiple times in 2016. In addition, North Korea also continues testing of large rocket engines that it claims are for space launch but would also be suitable for use in an ICBM. Such activities move North Korea closer to having the capability potentially to deliver a nuclear weapon to the United States, a goal explicitly expressed by North Korea's leader, Kim Jong-Un. Although the reliability of an untested North Korean ICBM is likely to be very low, North Korea has used its Taepo-Dong-2 launch vehicle to put a satellite in orbit, thus successfully demonstrating technologies applicable to a long-range missile.

Iran

Iran has the largest inventory of ballistic missiles in the Middle East and today can strike targets throughout the region and into southeastern Europe. Iran is seeking to enhance the lethality and effectiveness of existing systems with improvements in accuracy and warhead designs. Iran also has an anti-ship ballistic missile that can threaten maritime activity in the Persian Gulf and the Strait of Hormuz. Although Iran does not yet possess an intercontinental ballistic missile (ICBM), its progress on space launch vehicles (SLV) – along with its desire to deter the United States and its allies and partners – provides Iran with the means and motivation to develop longer-range missiles, including an ICBM. Iran currently has a large SLV, the Simorgh that incorporates many technologies applicable to longer-range missile systems, including an ICBM and it has previously stated it will conduct a second test flight of the Simorgh, which would put it closer to an operational intercontinental ballistic missile.

Syria

Although Syria does not pose a ballistic missile threat to the U.S. homeland, Syria does possess short-range ballistic missiles, and has shown a willingness to use them repeatedly against its own people. Syria has several hundred short-range ballistic missiles, all of which are mobile and can reach much of Israel and large portions of Iraq, Jordan, and Turkey from launch sites well within Syria.

Other Trends

In the regional ballistic missile context, one trend that particularly concerns the United States is the development of advanced ballistic missiles. For example, China is developing several new classes of offensive missiles; forming additional missile units; upgrading older missile systems; and developing methods to counter ballistic missile defenses. China is augmenting its 1,200 conventional short-range ballistic missiles with a limited but growing number of conventionally armed, medium- and intermediate-range ballistic missiles, including anti-ship ballistic missiles, which will improve China's ability to strike regional targets at greater ranges.

Russia's recent behavior currently poses one of our most pressing and evolving strategic challenges. We are confronted with Russia's occupation of Crimea; continuing aggressive Russian actions in eastern Ukraine; Russia's increasingly aggressive nuclear posturing and threats; and its violation of the Intermediate-Range Nuclear Forces Treaty. We are concerned that the Russian leadership may believe they can escalate first in order to de-escalate a crisis, a destabilizing strategy that would not result in Russia's desired effect.

Russia and China are both fielding advanced cruise missiles and both are developing hypersonic glide vehicles (HGV). Advanced cruise missiles and HGVs are emerging capabilities that constitute a challenge to our defense architecture. Their increased standoff capability, low altitude, and small radar signature make defending against them a technical and operational challenge. Russia employed its advanced cruise missile capability in 2015, conducting long range, precision strikes in Syria with missiles launched from naval platforms positioned nearly 1,000 miles away in the Caspian Sea. These strikes demonstrated the effective employment of a new generation of precise, long range conventionally armed cruise missile. These advanced

cruise missiles, given their increased stand-off range, enhanced precision, and increased lethality, provide a range of strike options that Russia could use to hold U.S. targets at risk, and potentially, produce strategic effects in a negotiated crisis situation. Chinese ballistic missile systems are complimented by the CJ-10 ground-launched cruise missile (GLCM). The CJ-10 has a range in excess of 1,500 km and offers flight profiles different from ballistic missiles that can enhance targeting options.

Lastly, there are growing indications that non-State actors possess ballistic missiles and are willing to use them. This has occurred most recently in the civil war in Yemen, where Houthi rebels have reportedly carried out short-range ballistic missile (SRBM) attacks against Arab Gulf forces and, Saudi Arabian cities, launched anti-ship missiles at U.S. ships on patrol off the coast of Yemen, and severely damaged a United Arab Emirates ship in October of last year.

Homeland Missile Defense

North Korea's bellicose rhetoric and provocative missile tests and Iran's improvements in range and accuracy of its ballistic missiles reinforce the need to protect the homeland against a ballistic missile attack. The U.S. homeland is currently protected against such an attack by the Ground-based Midcourse Defense system. This system consists at this point of 36 Ground-Based Interceptors (GBI) in Alaska and California; land-, sea-, and space-based sensors; and a command and control system operated 24/7 by well-trained service members. To ensure that we stay ahead of the threat, we are continuing to strengthen our homeland missile defense posture and invest in technologies to enable us to address emerging threats more effectively in the next decade.

At this time, we continue to believe that improving the capacity, reliability and effectiveness of the current Ground-based Midcourse Defense (GMD) system is one of our highest priorities. That is why the President's Budget Proposal for Fiscal Year (FY) 2018 would fund the Redesigned Kill Vehicle and the Long-Range Discrimination Radar; would begin work on a new radar in Hawaii; and would continue funding for advanced discrimination sensor technology and space-based kill assessment programs. We remain on track to complete the deployment of 8 more interceptors in Alaska by the end of this year bringing the total to 44.

These investments will enable us to get more performance out of the investments in our GMD system, enabling us to stay ahead of the threat for the foreseeable future.

We are also moving forward with efforts to bolster our defenses against advanced cruise missiles. We are nearly finished with the first part of our three-phase Homeland Defense Design effort, which is intended to enhance our ability to detect, track, and investigate suspicious aircraft, including cruise missiles, and when necessary, cue our defense systems against the full spectrum of air threats. This year, we will continue to integrate advanced sensors in the National Capital Region and are on track to begin the second phase of the Homeland Defense Design in FY2018 to expand aerospace surveillance capabilities. Phase 3 of our Homeland Defense Design is in concept development and is intended to validate and incorporate emerging technology and explore scalable and deployable options for the rest of North America.

Regional Missile Defense

The President's FY 2018 budget request also continues the deployment of missile defenses tailored to the security circumstances in Europe, the Middle East, and the Asia-Pacific region. Our focus is on developing and fielding deployable missile defense capabilities that are mobile and relocatable, which allows us to address crises as they emerge. Systems such as Patriot, Terminal High-Altitude Area Defense (THAAD), and Aegis BMD (afloat and ashore) allow us to have flexible, layered missile defense capabilities tailored to specific regional threats. We are also encouraging our allies and partners to acquire their own missile defense capabilities, and to strengthen mutual operational missile defense cooperation.

Europe

We are continuing to implement Phase III of the European Phased Adaptive Approach (EPAA), and we are working in close collaboration with our North Atlantic Treaty Organization (NATO) Allies to develop an advanced network of sensors and interceptors – on land and at sea – to protect NATO European territory and our military forces and facilities.

In July 2016, NATO Heads of State and Government declared an Initial Operational Capability of NATO BMD, largely due to the addition of the Aegis Ashore site in Romania that

was declared operational in May 2016 as well as developments in NATO command and control. The site was transferred to NATO operational control following the NATO Summit in Warsaw, Poland, in July 2016. NATO Allies have committed to spend roughly one billion Euros on NATO Ballistic Missile Defense Command and Control through approximately 2025. The President's budget request also supports the Aegis Ashore site that will be deployed in Poland in the 2018 timeframe and the development of the SM-3 Block IIA interceptor that will be deployed on land and at sea later this decade. As these capabilities become operationally available, they will increase BMD coverage of NATO European territory from threats emanating outside the Euro-Atlantic area.

Since 2011, the United States has operated a forward-based radar in Turkey and maintained a sea-based missile defense presence in Europe. And we now have a total of four U.S. Aegis BMD capable destroyers forward-deployed to the naval facility at Rota, Spain. These multi-mission ships support the missile defense mission, as well as other maritime missions.

The United States, Spain, Germany, and the Netherlands have all deployed Patriot systems in defense of Turkey in the past. Spain continues to maintain a Patriot deployment in Turkey, and is strengthening its air and missile defense capabilities by acquiring additional Patriot systems from Germany. Italy is also maintaining its deployment of a SAMP/T air and missile defense system to Turkey as well.

Several Allies have modern surface combatant ships that could be equipped with BMD sensor or interceptor capability upgrades. The Netherlands is upgrading the SMART-L radars on four of its frigates and Denmark has committed to developing a sea-based sensor to contribute to NATO BMD.

In its 2015 Strategic Defense and Security Review, the United Kingdom committed to invest in a ground based radar.

France could provide its Spirale satellite detection system and a long-range radar for NATO territorial missile defense and has developed the SAMP/T air and missile defense system, which was fielded in 2013, and could potentially be offered to NATO BMD.

Beyond hosting the second Aegis Ashore site in Europe, Poland has also announced its intention to spend up to $12 billion to acquire advanced air and missile defense capabilities. Romania recently announced its intention to purchase Patriot systems.

The United States will continue to encourage its NATO Allies to do more to cooperate and invest in ballistic missile defenses that will contribute to Alliance security.

Asia-Pacific

In the Asia-Pacific region, our force posture includes Aegis BMD-capable ships, along with Patriot batteries deployed in Japan and South Korea and the recent deployment of THAAD to South Korea. We have also maintained the THAAD battery deployment to Guam in response to North Korean provocations.

The cornerstone of our security and diplomacy in the region has been our strong bilateral alliances, including with South Korea, Japan, and Australia. All three of these nations play an important role in our regional efforts to achieve effective ballistic missile defense.

South Korea has an immediate, proximate stake in preventing ballistic missile strikes from North Korea. We have worked closely with South Korea to ensure that our alliance maintains the capability and capacity to do just that. The United States deploys Patriot PAC-3 batteries in South Korea to defend U.S. and South Korean forces and is in the process of finalizing deployment of a U.S. THAAD system on its soil. South Korea has taken steps to enhance its own air and ballistic missile defense systems, which include sea- and land-based sensors and Patriot PAC-2 batteries and is currently working to develop its own indigenous BMD system. In addition, the United States is working with South Korea to upgrade its PAC-2 Batteries to the PAC-3 interceptor to provide a more robust BMD capability.

Japan has its own layered ballistic missile defense system, which includes Aegis BMD ships with Standard Missile-3 interceptors, PAC-3 batteries, early-warning radars, and sophisticated command-and-control systems. Japan is upgrading two ATAGO-class Aegis destroyers and plans to build two additional Aegis BMD ships, which would increase its inventory to a total of eight BMD-capable ships. Japan also hosts two U.S. missile defense radars that support both regional and homeland missile defense.

Additionally, Japan is a critical international partner for BMD development. One of our most significant cooperative efforts is the co-development of an advanced version of the SM-3 interceptor, the SM-3 Block IIA.

The United States and Australia have a long history of close consultation on missile defense issues. As a result of Australia's 2016 Defence White Paper, these talks have been formalized and are on track to produce new options for bilateral ballistic missile defense cooperation. In addition, Australia is involved in a trilateral discussion on BMD in the Pacific involving the United States, Australia, and Japan.

We will continue to emphasize the importance of developing a regional BMD framework that includes the sharing of sensor data among allies to take full advantage of the benefits of system interoperability. For example the U.S., ROK, and Japan have expanded data sharing to include the first of its kind trilateral BMD data sharing exercise last year, but up until now, the data from each nation had to be shared through the U.S. However, the ROK and Japan recently completed their General Security of Military Information Agreement (GSOMIA) which will enable greater sharing of information and data between the two nations directly. Future exercises planned for later this year will continue to create more robust data sharing between our three nations further increasing the efficiency of allied missile defense capabilities against the North Korean threat.

Middle East

We also maintain a robust ballistic missile defense presence in the Middle East, including land- and sea-based assets deployed in defense of our forward-deployed forces, and those of our allies and partners. This is in addition to our efforts to build the capacity of those allies and partners that will ultimately contribute to their ability to defend themselves.

Missile defense collaboration with Israel is a notable bilateral success story. The jointly developed Arrow and David's Sling weapon system programs provide Israel with the capability to defend itself against imminent and emerging ballistic missile threats while benefitting the United States through technology sharing. In addition, since 2014, U.S. companies have co-produced Iron Dome components. The recent 10-year, $38 billion, U.S.-Israel Memorandum of Understanding (MOU) includes a commitment of $500 million for missile defense each year

beginning in FY 2019. This commitment exceeds the average level of annual, non-emergency support that the United States previously provided Israel for ballistic missile defense over the last five years. The intent of the multi-year commitment in the MOU is to facilitate Israel's long-term budget planning and to ensure U.S. budget predictability in supporting Israel's missile defense development and production requirements. Although U.S. industry receives meaningful workshare through participation in Israeli ballistic missile defense programs, we must also ensure U.S. missile defense requirements receive sufficient funding. Operationally, missile defense is also the central focus of the JUNIPER COBRA exercise series – an important U.S.-Israeli military exercise that allows us to work through key interoperability challenges in responding to a potential missile crisis involving Israel.

The United States is also working with a number of Gulf Cooperation Council (GCC) countries on missile defense, including supporting the purchase of BMD systems through the Foreign Military Sales program. The United Arab Emirates (UAE) procured the THAAD system in addition to its earlier purchase of Patriot systems. Saudi Arabia is in the process of upgrading its existing Patriot PAC-2 batteries to the PAC-3 configuration and is interested in pursuing additional air and missile defense capability. Kuwait is also purchasing Patriot PAC-3 batteries. Qatar also joined the group of U.S. Patriot partners late last year.

U.S. Air Forces Central Command maintains a series of regular exchanges between U.S. and GCC air defense officers at the Combined Air Operations Center located at Al Udeid Air Base in Qatar. These exchanges provide an opportunity for increased situational awareness of missile threats in the region as well as the potential for future BMD planning and operational cooperation.

As the GCC States begin to field more capable systems, the United States and its Gulf partners must work toward greater integration of those capabilities across the region. As promised at the Camp David Summit in 2015, the United States completed a study of Ballistic Missile Early Warning System (BMEWS) requirements, including sensor and command and control architectures. The goal of the study is to inform potential GCC-wide BMEWS acquisition plans that will enable a regional missile defense architecture in which GCC Member States participate and contribute to the extent practical, leading to a networked, layered defense

of key strategic centers that strengthens deterrence and increases collective ability to defeat a ballistic missile attack.

Technology Development

We must continue to look ahead. This means ensuring that our investment strategy and priorities balance the needs of addressing the most dangerous threats we confront today while positioning us to respond to threat developments in the next decade. Areas for priority technology investment include persistent discrimination in the current and future Ballistic Missile Defense System sensor architecture; lasers for multiple BMD applications; a multi-object kill vehicle; advanced technology for high-risk/high-pay-off breakthroughs; and a rail gun to lower the cost per kill.

Additionally, we are looking to invest in our cruise missile defense architecture—especially as it relates to the National Capital Region. Given the threat facing the U.S. homeland, we require persistent surveillance and detection of cruise missiles. To that end, we are working with North American Aerospace Defense Command and others to identify technologies that give us this persistent surveillance and detection. We are also working closely with our Canadian partners to examine future technologies to cover the northern approaches.

Today's security environment is dramatically different than the one in which we have been engaged over the last 25 years. It requires new ways of thinking and acting. It also requires new ways of acquiring and employing capabilities. Given this new security environment, we must also look at new ways to support our U.S. defense strategy. In the case of defeating ballistic missiles, we need to develop a wider range of tools, including efforts underway to address such threats before they are launched, or "left of launch." The development of left-of-launch capabilities fuses non-kinetic, cyber, electromagnetic, and kinetic capabilities to deny, defend, and defeat adversary threats and will provide U.S. decision-makers additional tools and opportunities to defeat missiles. We must also examine policy and organizational constructs to ensure they enable the Warfighter in finding, fixing, and destroying ballistic missiles before launch. This will in turn reduce the burden on our "right-of-launch" ballistic missile defense capabilities. Taken together, left-of-launch and right-of-launch concepts and developments will lead to more effective and resilient capabilities to defeat adversary ballistic missile threats. This

is a challenging operational issue, and I am pleased to be testifying with several other individuals who can offer additional perspectives on this subject.

Lastly, as previously noted, President Trump has directed the Department to conduct a BMDR. The BMDR will address many of the issues highlighted above. We plan to complete the review in time for it to inform the FY2019 President's Budget Request – probably sometime in the fall timeframe.

CONCLUSION

The Department of Defense continues to develop, procure, and field missile defense systems to protect vital U.S. national security interests. We will ensure we are able to meet the adversaries' ballistic and cruise missile developments and will continue to seek capabilities to lower the cost-per-intercept and defeat emerging ballistic and cruise missile threats.

Thank you for the opportunity to appear before you today. I look forward to your questions.

Thomas H. Harvey III
Acting Assistant Secretary of Defense for Strategy, Plans, and Capabilities

Thomas (Todd) Harvey currently serves as Acting Assistant Secretary of Defense for Strategy, Plans, and Capabilities. He is responsible for advising the Secretary of Defense and the Under Secretary of Defense for Policy on national security and defense strategy; the forces and contingency plans necessary to implement defense strategy; nuclear deterrence and missile defense policy; and security cooperation plans and policies.

Previously, Mr. Harvey served as the Principal Deputy Assistant Secretary of Defense for Strategy, Plans and Capabilities, overseeing development of strategic guidance for DoD and ensuring that program, budget, and posture decisions support and advance the strategic direction laid out by senior DoD leadership.

Prior to assuming his present position, Mr. Harvey was the OSD Policy Principal Director for Force Development from 2011-2013, with responsibility for advising senior DoD leaders on how best to align defense investments to support the Department's security strategy.

Mr. Harvey served as US Southern Command's J9 (Partnering) Director in 2010, with the primary mission of ensuring that the Command and its activities were fully integrated with broader US Government policies and initiatives in Latin America and the Caribbean. During 2008-2009, Mr. Harvey was Chief of Staff for International Security Affairs in OSD Policy, which oversees formulation of U.S. defense and security policy related to the Middle East, Europe, and Africa.

From 2005-2008, he served first as Principal Director for Stability Operations and then Partnership Strategy in OSD Policy, where he oversaw a number of programs associated with DoD's role in security assistance, foreign assistance reform, international health capacity efforts, and DoD defense posture and force management measures to promote partner security capacity overseas. From 2000-2005, Mr. Harvey was OSD Policy Director for Humanitarian Affairs, overseeing DoD programmed humanitarian assistance activities, DoD humanitarian mine action efforts, and DoD contributions to disaster response worldwide.

From 1994-2000, Mr. Harvey served as Senior Country Director for Korean Affairs in the Pentagon. Before working on Asia issues, Mr. Harvey held duties in various OSD offices, including Near East/South Asia Affairs, where he served as Iraq desk officer (1992-93), and in the U.S. Mission to NATO in Brussels (1993-94), where his work focused on the Partnership for Peace initiative. Mr. Harvey previously served five years in the U.S. Army as a paratrooper and helicopter pilot with the 82d Airborne Division. He received his undergraduate degree from Georgetown University's School of Foreign Service and completed graduate studies at the Fletcher School of Law and Diplomacy. He is also a graduate of the National War College.

Mr. Harvey's honorary awards include the DoD Distinguished Civilian Service Award (2006), the CJCS Distinguished Civilian Service Award (2010), the CJCS Meritorious Civilian Service Award (1999), the DoD Exceptional Civilian Service Award (2009), and two OSD Awards for Excellence (1995, 2010).

Unclassified Statement of

Vice Admiral J.D. Syring, USN

Director, Missile Defense Agency

Before the

House Armed Service Committee

Subcommittee on Strategic Forces

Wednesday, June 7, 2017

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House Armed Services Committee
United States House of Representatives

Vice Admiral J.D. Syring, USN
Director, Missile Defense Agency
Before the
House Armed Services Committee
Strategic Forces Subcommittee
June 7, 2017

Good afternoon, Chairman Rogers, Ranking Member Cooper, distinguished Members of the subcommittee. I appreciate this opportunity to testify before you today. The Missile Defense Agency (MDA) budget request of $7.9 billion for Fiscal Year (FY) 2018 will continue the development of reliable, increasingly capable, and state-of-the-art defenses for our Nation, deployed forces, allies, and international partners against ballistic missiles. The FY 2018 missile defense program will continue to support the Warfighter and the current and future needs of the Combatant Commanders with the development, testing, deployment, and integration of interceptors, sensors, and the command, control, battle management and communications (C2BMC) system for the Ballistic Missile Defense System (BMDS).

Ballistic Missile Threat

The ballistic missile threat is growing more sophisticated as countries continue to improve their missiles by increasing the range, incorporating ballistic missile defense (BMD) countermeasures, and making them more complex, survivable, reliable, and accurate. Maneuvering threats continue to be developed and fielded. Although hypersonic glide vehicles and missiles flying non-ballistic trajectories were first proposed as far back as World War II, technological advances are only now making these systems practicable. Both Russia and China announced successful hypersonic glide vehicle launches in 2016.

Space-launch activities involve multistage systems that further the development of technologies for intercontinental ballistic missiles (ICBMs). In addition to the Taepo Dong 2

space launch vehicle/ICBM, North Korea is developing and has paraded the KN08 road-mobile ICBM and a new road-mobile ICBM. Over the past year North Korea conducted an aggressive testing campaign, launching at least seven Musudan intermediate-range ballistic missiles (IRBMs), which have a range greater than 3,000 kilometers. It also conducted multiple test launches of a new submarine-launched ballistic missile. In February 2017 North Korea publicized the launch of a new solid-propellant missile that appeared to be a land-based variant of its submarine-launched ballistic missile. Most recently North Korea conducted a near-simultaneous ballistic missile salvo launch of four missiles into the Sea of Japan and announced the units firing the missiles had the mission of targeting U.S. bases in Japan. Today North Korea fields hundreds of Musudan, No Dong, and Scud missiles that can reach U.S. forces forward deployed in the Asia-Pacific region.

Iran has successfully orbited small satellites and announced plans to orbit a larger satellite using the Simorgh space launch vehicle, which could be configured to be an ICBM. Progress in Iran's space program could shorten a pathway to an ICBM because space launch vehicles use similar technologies, with the exception of their payloads. Iran continues to develop more sophisticated missiles and improve the range and accuracy of current missile systems, deploying next-generation short- and medium-range ballistic missiles (SRBMs and MRBMs), some with maneuvering reentry vehicles and new submunition payloads. Iran demonstrated its capability to modify currently deployed ballistic missile systems by flight-testing a Fateh-110 ballistic missile with a seeker in an anti-ship role, which would enable Iran to threaten maritime activity throughout the Persian Gulf and Strait of Hormuz.

Support for the Warfighter

Our priority is to continue to deliver greater missile defense capability and capacity to the Warfighter in support of Combatant Command priorities and defense strategy. This budget maintains the commitment to emplace 44 Ground Based Interceptors (GBIs) by the end of this year for homeland defense and enhance the overall reliability and performance of the GBI fleet. To strengthen regional defenses, we plan to deliver a total of 36 Standard Missile (SM)-3 Block IBs to the Navy in FY 2018 for use on Aegis BMD ships and at the Aegis Ashore site in Romania, for a total of 182 delivered since December 2013. MDA also plans to deliver in FY 2018 an additional 52 Terminal High Altitude Area Defense (THAAD) interceptors to the Army, for a total of 210 delivered since May 2011. We will also press forward with plans to identify, develop, and field cost-effective solutions to enhance BMDS sensors and discrimination for homeland and regional defenses.

Aegis Ashore Missile Defense System Romania is mission-capable today. In a ceremony held May 12, 2016, U.S. European Command's naval component, U.S. Naval Forces Europe-Africa/U.S. 6th Fleet, deemed Aegis Ashore Romania as operationally certified. In the 2018 timeframe, we will further enhance defensive coverage for NATO Europe against medium- and intermediate-range threats with the deployment of an Aegis Ashore site in Poland and the delivery of the SM-3 Block IIA and associated Aegis BMD weapon system upgrades for Aegis BMD ships and Aegis Ashore sites.

MDA routinely provides Warfighter operational support by performing the mission essential functions of BMDS configuration control, asset management, and operational readiness reporting and by providing an operational-level interface to United States Northern Command, European Command, Central Command, and Pacific Command and facilitating increased Warfighter participation in development of future missile defense capabilities. MDA will continue

to lead the integration of evolving MDA, Service, and COCOM command and control capabilities through systems engineering analysis and development of technical integration requirements and interface control documents to address the fielding of air, missile, and rocket capabilities by U.S. adversaries. We also are working with the Office of the Secretary of Defense on the Ballistic Missile Defense Review, which was mandated in the January 27, 2017 Presidential Memo on Rebuilding the U.S. Armed Forces and the Missile Defense Report.

MDA executes a fully integrated test program that synchronizes the system with the Warfighters trained to operate the system under varying wartime conditions against current and emerging threats. This ensures that BMDS capabilities are credibly demonstrated and validated prior to delivery to the Warfighter. We continue to work closely with independent testers within DoD -- the Director, Operational Test and Evaluation; Deputy Assistant Secretary of Defense, Developmental Test & Evaluation; Service Operational Test Agencies; and Combatant Commands, represented by the Joint Forces Component Command for Integrated Missile Defense -- to develop an Integrated Master Test Plan to execute a robust, cost-effective test program.

Our system ground tests are the primary source for system performance data, and they test our capability across a wide range of threats and environments that cannot be affordably replicated in flight tests. In addition to 27 element-level ground tests, we conducted six developmental and operational system-level ground tests from October 2015 to present. There are three more system-level ground tests scheduled for this fiscal year and seven more planned for FY 2018. Last year, we also conducted or participated in more than 20 multi-event exercises and wargames, which are critical to the Combatant Commands and the intensive engineering efforts across the Agency.

Flight testing provides data for our modeling and simulation and demonstrates the performance functions of the system that ground testing cannot address. The flight test program

continues to increase in operational realism with each successive test as the BMDS matures. One of the key attributes of each flight test is combining the system under test with the Soldiers, Sailors, Airmen, and Marines that plan to operate the system in wartime under operationally realistic conditions. We also work with our allies to prove BMD capabilities are integrated and interoperable before they are fielded. From October 2015 to present, we have executed 18 flight tests. For the remainder of FY 2017 we will conduct 10 more flight tests, and in FY 2018 11 flight tests including the operational test of European Phased Adaptive Approach (EPAA) Phase 3 capabilities and the first salvo test using the Ground-based Midcourse Defense (GMD) system.

This budget takes several steps to improve the effectiveness of the BMDS to defeat increasingly dynamic missile threats and thereby grow the Warfighter's confidence in the system. It increases the capability and capacity of the current missile defense systems. It supports our work with the Combatant Commands and Services to address the growing and highly challenging hypersonic glide vehicle threat today. This budget also pursues advanced technologies in a measured way that leads us to make prudent and affordable investments in game-changing capabilities. We will also continue to engage our allies on contributions to regional missile defense missions, which not only encourages our international partners to take on a greater share of the defense cost burden, but it also helps grow our missile defense capability and capacity.

Homeland Defense

MDA remains committed to operating, sustaining, and expanding our nation's homeland missile defenses and requested $1.5 billion in FY 2018 for the Ground-based Midcourse Defense (GMD) program. We currently have emplaced 36 operational Ground Based Interceptors (GBIs) and plan to expand the GBI fleet to 44 by the end of 2017. The Agency will continue flight and system ground testing of our homeland defenses, continue Redesigned Kill Vehicle (RKV)

development, enhance the Stockpile Reliability Program, and expand the GBI battle space. We will continue developing GMD ground systems hardware/software upgrades and fire control and kill vehicle software to improve discrimination capabilities. We also will add precision and confidence in our reliability assessments by performing failure modes and process analyses, reliability testing, short-circuit and grounding analyses, and verification of our on-going reliability model development efforts.

Increasing GBI Capacity

We fielded eight new Capability Enhancement (CE)-II GBIs in 2015 using the cradled Inertial Measurement Unit upgrade we successfully flew on the June 2014 FTG-06b interceptor. We then removed eight previously delivered CE-II GBIs from the fleet and upgraded them to the configuration proven in FTG-06b. Emplacement of the eighth and final upgraded CE-II GBI was completed in November 2016. We delivered all sixteen of these GBIs, and they are currently available to US Northern Command as part of the operational fleet.

The May 30, 2017 FTG-15 intercept flight test against an ICBM-range target demonstrated the new CE-II Block 1 Exo-atmospheric Kill Vehicle (EKV) and Configuration 2 (C2) 3-stage booster. MDA will begin deliveries in 2017 of nine new GBIs configured with CE-II Block 1 EKVs with the new alternate divert thrusters and three-stage C2 booster vehicles following this successful intercept flight test of those new components. Last year we completed refurbishment of Missile Field 1 at Fort Greely, AK, which provides the additional six silos required to support the 44 GBI total.

MDA is developing the capability to provide the Warfighter the option of either flying GBIs using all three booster stages or not igniting the third stage to provide performance similar to a 2-stage boost vehicle. This approach will provide additional homeland defense battle-space

capability through shorter engagement times without the expense of a separate 2-stage boost vehicle development program. This capability is planned to be tested in calendar year 2019, after which it will be fielded on all boost vehicle configurations.

GMD Testing

The GM CTV-02+ flight test, executed on January 28, 2016, successfully achieved its primary objectives and provided the necessary data to evaluate the performance of the EKV alternate divert thruster and conduct early evaluation of Near Term Discrimination Improvements for Homeland Defense for multiple elements of the BMDS. FTG-15 demonstrated and evaluated the performance of the new CE-II Block 1 EKV and the C2 booster. It also was the first intercept of an ICBM-range target by the GMD system or any other BMDS element. Success of this test will allow MDA to meet the commitment to deliver 44 GBIs by the end of 2017. We plan to conduct the FTG-11 operational intercept flight test in the fourth quarter of FY 2018, which will demonstrate the capability of the GMD system with a two GBI salvo engagement of an ICBM-range target; a 3-stage CE-II Block 1 and 3-stage CE-II salvo will attempt the intercept of a threat representative ICBM target launched from Reagan Test Site, Kwajalein using GBIs launched from Vandenberg Air Force Base, CA.

Redesigned Kill Vehicle and C3 GBI Booster

Reliability is a critical part of how the Warfighter decides upon a shot doctrine, that is, the estimation of how many shots it will take to defeat a credible threat. With a highly reliable interceptor, fewer shots would be required. The Redesigned Kill Vehicle (RKV) will improve reliability and make homeland defenses more robust. The RKV will help address the evolving threat, enhance kill vehicle reliability, improve in-flight communications to better utilize off-board sensor data, and enhance Combatant Commanders' situational awareness via hit/kill

assessment messages. The program schedule achieves its first controlled test vehicle flight test of the RKV in FY 2020 (GM CTV-03). The first intercept flight test (FTG-17) is planned for FY 2021 with a second intercept flight test (FTG-18) in FY 2022. We anticipate deploying the RKV beginning in the 2022 timeframe.

Ground System Upgrades

MDA is continuing with capability upgrades and technology modernization of key ground support and fire control systems components such as the GMD Fire Control (GFC) equipment, Command and Launch Equipment, the GMD Communications Network, and the In-Flight Interceptor Communication System (IFICS) Data Terminal (IDT). This past year the Warfighter accepted the newly constructed IDT at Fort Drum, NY. The capability upgrades include GFC-Warfighter interface and logic improvements, 2-/3-stage selectable GBI battle management, discrimination improvements, enhancements to the kill vehicle Target Object Map, and On-Demand Communications required for the RKV. Ground system modernization will mitigate obsolescence issues, improve cybersecurity resilience, increase GFC capacity for emerging threat and raid size, reduce life-cycle cost, increase system reliability and operational availability, and simplify the insertion of future technologies.

Homeland Defense Sensors

We are investing in radars and developing advanced electro-optical sensors to achieve a diverse sensor architecture that eventually will provide highly accurate midcourse tracking and discrimination. In this year's budget submission we highlight the continued development of the Long Range Discrimination Radar (LRDR) and our advanced discrimination sensor technology and space-based kill assessment programs that we believe will improve system target

discrimination and assessment capabilities. Improved sensor coverage and interceptor capabilities will help the Warfighter expand the battle-space in order to reengage threats as needed.

We requested $191.1 million to sustain COBRA DANE, the Upgraded Early Warning Radars (UEWR), and the Army Navy/ Transportable Radar Surveillance and Control Model-2 (AN/TPY-2) radars. The Services and Combatant Commands, with logistical support from MDA, operate AN/TPY-2 (Forward Based Mode) radars in Japan (one radar at Shariki and the other radar at Kyogamisaki), Israel, Turkey, and U.S. Central Command in support of homeland and regional defense.

We requested $213.5 million to continue the development of advanced discrimination algorithms for the AN/TPY-2, Sea-Based X-band (SBX), and the UEWR radars to counter evolving threats. The discrimination improvement effort will develop and field integrated Element capabilities to improve the BMDS ability to identify lethal and non-lethal objects. Beginning in FY 2018, MDA will complete transition to production design activities for next generation Gallium Nitride Transmit/Receive Integrated Multichannel Modules to support the AN/TPY-2 obsolescence and sparing strategy and set the condition for enhanced performance in the future. Additionally, MDA is conducting a study to assess the feasibility of a long-range discrimination radar or other appropriate tracking and discrimination sensor capabilities in a location optimized to support the defense of the United States against emerging long-range ballistic missile threats from Iran. MDA requested $84.2 million for BMD Sensors testing activities for planning, analysis and execution of BMDS flight test events, including pre- and post-test efforts such as Digital and Hardware-in-the-Loop Pre-Mission Tests, and Post-Flight Reconstruction.

MDA requested $130.7 million for the SBX radar. The SBX is an advanced mobile radar that provides precision midcourse tracking and discrimination capabilities. The SBX participates in flight tests to demonstrate discrimination and debris mitigation improvements. To address the continued missile test activity of North Korea, our budget request includes funds to extend at-sea time from 120 to 230 days-at-sea and conduct contingency operations for defense of the homeland in the U.S. Pacific Command and U.S. Northern Command areas of responsibility.

We requested $357.7 million to continue development of the LRDR. The LRDR is a midcourse sensor that will provide persistent long-range midcourse discrimination, precision tracking and hit assessment and improve BMDS target discrimination capability while supporting a more efficient utilization of the GMD interceptor inventory. LRDR also will support additional mission areas, including Space Situational Awareness. The LRDR site will be constructed as two separate military construction projects. For FY 2017, Congress fully funded Phase 1 of the LRDR project that provided $155 million for a Shielded Mission Control Facility and Radar Foundation. MDA will begin military construction of Phase 1 in FY 2017. Phase 2 in FY 2019 will address the shielded Power Plant that includes fuel storage, a maintenance facility, and associated site support. Initial fielding of the LRDR is planned for 2020 leading to an Operational Readiness Acceptance by the Warfighter in the 2022 timeframe.

The BMDS currently provides persistent missile defense of Hawaii through the existing sensor network, C2BMC, and the GMD system. The Sensor Analysis of Alternatives (AoA), conducted by the Department to assess the most cost-effective options for enhanced sensor capability to increase GBI effectiveness against future, more complex threats, found that a next critical near-term step to optimizing tracking and discrimination capabilities in the Pacific is to deploy a radar in the Pacific. The Department is now developing an operational assessment of the

solutions, which includes a radar in Hawaii, the results of which will inform the President's Budget for 2019. We requested $21 million in FY 2018 for the Homeland Defense Radar – Hawaii (HDRH) to conduct source selection activities. This radar will provide a persistent capability, augmented by other sensors to mitigate the effects of the evolving threats to the BMDS, optimize discrimination capability in the Pacific architecture, and increase the defensive capability of GBIs for the enhanced defense of Hawaii.

Regional Defenses

There are hundreds of ballistic missiles within range of U.S. forces and allies worldwide. Our FY 2018 budget request continues to resource the deployment of regional defenses to protect our deployed forces, allies and international partners against SRBMs, MRBMs, and IRBMs.

Terminal High Altitude Area Defense

Terminal High Altitude Area Defense (THAAD) is a transportable, ground-based missile defense system that defends against short- , medium-, and intermediate-range ballistic missiles in the terminal stage of flight. THAAD provides Combatant Commanders a rapidly deployable capability to deepen, extend, and complement BMDS homeland and regional defenses. THAAD is now 13 for 13 in flight testing. MDA is conducting New Equipment Training for the 6th Battery, which will be ready for operational support later this calendar year. We continue to deliver interceptors for the U.S. inventory and ground equipment for the 6th and 7th U.S. Batteries. We are also executing a Foreign Military Sales case with United Arab Emirates for two THAAD Batteries. MDA continues to provide maintenance and supply support of the first deployed THAAD battery (comprising the THAAD system and AN/TPY-2 radar) in Guam.

Recent provocations further demonstrate the serious threat North Korea poses to the Republic of Korea (ROK), the Asia-Pacific region, and our forward deployed forces. U.S. Pacific

Command deployed the first elements of the THAAD system to the ROK on March 6, implementing the U.S.-ROK Alliance's July 2016 decision to bring the defense capability to the peninsula. The deployment of THAAD (to include the Terminal Mode AN/TPY-2 radar) contributes to a layered missile defense system and enhances the U.S.-ROK Alliance's defense against North Korean missile threats.

The Army and MDA are developing a Memorandum of Agreement (MOA) to transfer the THAAD and AN/TPY-2 systems from MDA to the Army. Research and development of THAAD and AN/TPY-2 radars would remain in MDA. The MOA will address the alignment of lifecycle responsibilities, resources and authorities. The current plan is for the Army and MDA to present the MOA status to the Missile Defense Executive Board later in 2017.

MDA requested $230.2 million across the FYDP for THAAD development efforts. We will continue development of THAAD software upgrades, concept development, and risk reduction activities for THAAD Follow-On that would have advanced capabilities against emerging threats, to include complex scenes and countermeasures. These activities will explore and mature the expansion of THAAD system interoperability with air and missile defense systems to extend THAAD battlespace and defended area. MDA also requested $36.2 million for Terminal Defense Testing. This includes Flight Test Operational-03 Event 2 (FTO-03 E2) in FY 2018 at the Pacific Spaceport Complex-Alaska on Kodiak Island, which will further demonstrate, in an operational scenario, THAAD's ability to conduct coordinated engagements with Aegis BMD and PATRIOT operating with C2BMC and a forward-based AN/TPY-2 radar while engaging an IRBM. THAAD also will execute a flight test tracking event (FTX-35) in FY 2018 at White Sands Missile Range, which will prove THAAD software build 3.0 and test a new

AN/TPY-2 radar configuration with a THAAD battery. This event also will support the Army's Materiel Release.

In FY 2017 THAAD will participate in two flight tests, FTT-18 and FTT-15. In FTT-18 THAAD will demonstrate an intercept of a separating IRBM target using the THAAD radar, launcher, fire control and communication, interceptor operations and engagement operations. FTT-15 will demonstrate the capability of the system to do an endo-atmospheric data collect against an MRBM target with associated objects.

MDA requested $451.6 million to continue procurement of THAAD equipment, including 34 THAAD interceptors in FY 2018. By the end of FY 2018, MDA will deliver 52 additional THAAD interceptors to the U.S. Army, for a total of 210 interceptors delivered. MDA received an incremental production decision in the fourth quarter of FY 2016 for THAAD, authorizing continued production of at least 79 additional interceptors through FY 2020. MDA also requested $78.8 million of Operations and Maintenance funding to support the maintenance and upkeep of all BMDS unique items of the fielded THAAD batteries as well as for all THAAD training devices. In FY 2018 MDA will provide support to seven THAAD batteries.

Aegis Ballistic Missile Defense

Aegis BMD continues to be the backbone of the Nation's regional defense for our deployed forces, allies, partners and friends, and directly supports and expands our homeland defenses with long range surveillance and track capability. The FY 2018 budget request supports continued advancement of the system to counter the growing threats.

In FY 2016 we completed three Aegis BMD Weapon System installations on Aegis ships: one Aegis BMD 3.6 to 4.X upgrade and two Aegis BMD 3.6 to Aegis Baseline (BL) 9.C1 (BMD 5.0CU) upgrades. We also initiated two Aegis BMD Weapon System installations on Aegis

ships: one Aegis BMD 3.6 to Aegis BL 9.C1 (BMD 5.0CU) upgrade and one Aegis BMD 3.6 to 4.X destroyer upgrade with completion dates in FY 2017. In FY16, we delivered 33 Standard Missile -3 (SM-3) Block IB missiles. In FY 2017 we began an additional three Aegis BMD Weapons Systems installations on Aegis ships: one Aegis BMD 3.6 to 4.X, one Aegis BMD 3.6 to Aegis BL 9C.1 (BMD 5.0CU), and the first Aegis BL 9.C2 (BMD 5.1) on a non-BMD capable ship. Additionally, we plan to deliver 54 SM-3 Block IB production rounds to the Fleet.

In May 2016, we completed two very successful developmental flight tests to verify the SM-3 Third Stage Rocket Motor Nozzle Engineering Change Proposal (ECP). SM Controlled Test Vehicle (CTV)-01a and SM CTV-02 successfully fired two SM-3 Block IB missiles from an Aegis BMD destroyer at Pacific Missile Range Facility (PMRF) in Hawaii. This ECP successfully addressed the FTM-16 Event 2 and FTM-21 (Missile 2) Failure Review Board recommendations by implementing nozzle design modifications. MDA executed these tests as mandatory prerequisites to both the ECP production cut-in and a future production decision for the SM-3 Block IB program. MDA also plans to execute FTM-26 later this year as an additional intercept flight test of the SM-3 Block IB to support the full production decision.

We are strongly committed to further enhancing capability of the Aegis BMD system and continuing to improve the Aegis Weapon System in alignment with Navy requirements. As previously stated, Aegis BMD's FY 2017 milestones include three BMD ship upgrades, 54 SM-3 Block IB missile deliveries, four ground test campaigns, and eight flight tests, including the initial intercept testing of the SM-3 Block IIA missile. We are also planning for the early certification of Aegis BMD 4.1 delivering BMD 5.0CU capability with Sea Based Terminal defense with the SM-6 missile, the installation of the Aegis Ashore Deckhouse and equipment in Poland, and the receipt of an SM-3 Block IB full rate production decision. In FY 2018, we will begin developing

the capability to upgrade the SM-3 Block IB hardware and software to leverage the enhanced capability of the SM-3 Block IIA.

In FY 2018, we will continue our commitment to develop, test, and deliver global naval capability to the Warfighter and support defense of our deployed forces and European NATO allies through delivery of European Phased Adaptive Approach (EPAA) Phase 3 missile defenses. MDA requested a total of $624.1 million in procurement for Aegis BMD, which plays a critical role in both homeland and regional defense. MDA is requesting $425.03 million to procure 34 Aegis SM-3 Block IB missiles along with associated hardware and support costs in FY 2018. By the end of FY 2018, we plan to have 167 Block IBs in inventory. The procurement budget also requested $160.3 million for Aegis BMD Weapon Systems equipment. MDA requested $38.7 million for advance procurement for economic order quantities beginning in FY 2018. MDA will continue to deliver SM-3 Block IBs to the Navy for deployment on-land at the Aegis Ashore site in Romania and at sea on multi-mission Aegis ships with BMD capability. In coordination with the U. S. Navy, we continue to expand the Fleet, and by the end of FY 2017 we anticipate having 33 (36 by the end of FY 2018) ships equipped with the Aegis BMD weapon system.

The Navy is working with MDA to integrate the multi-mission Aegis BL 5.3 with Aegis BMD 4.1 in to a single computer program. We will deliver Aegis BL 5.4 in FY 2019. MDA also continues collaboration efforts with the U.S. Navy on AN/SPY-1 radar antenna improvements that, when coupled with Aegis BL 5.4, increase radar detection sensitivity. We also will continue computer program development for BMD 6.X capability. This Computer Upgrade will integrate BMD capability with the advanced Air and Missile Defense Radar (AMDR), also known as the AN/SPY-6, for remote engagements and increased raid capacity with simultaneous multi-mission capabilities.

Adding an additional layer to the Aegis BMD weapon system, we are using an incremental development approach integrated within the Navy's Baseline 9 architecture to develop and deliver a Sea Based Terminal capability. By expanding the capability of the SM-6 missile and BMD 5 series weapon systems, we are delivering capability to maritime forces to protect against anti-ship ballistic missiles and provide layered defense for forces ashore.

We executed a critical non-intercept flight test (FTX-21) in May 2016 involving the Aegis Sea Based Terminal defense of the fleet capability against an advanced threat representative target. The target, launched from the Pacific Missile Range Test Facility (PMRF) in Hawaii, was the first flight of the MRBM Type 3 Phase 2 target. The USS John Paul Jones (DDG 53), an Aegis Baseline 9.C1 (BMD 5.0 CU) configured destroyer, detected and tracked the target. This was a very important step in ensuring the safety of the fleet and demonstrating the Sea Based Terminal capability.

In December 2016 we conducted a detection, tracking, and intercept test (FTM-27) to further assess the capability of Sea Based Terminal Increment 1 in the Aegis Baseline 9.C1 (BMD 5.0CU) Weapon System. During this test we fired a salvo of two SM-6 Dual I missiles against the MRBM target launched out of PMRF. In this no-notice test, the sailors on the consoles aboard the USS John Paul Jones demonstrated the ability to conduct a critical terminal defense engagement in a ship-defense role. This was the first intercept test of this kind and it gives us greater confidence in the reliability and performance of our Sea Based Terminal defense capabilities. We are planning an additional test of the Sea Based Terminal Increment 1 capability in 2017.

Sea Based Terminal Increment 2, which further improves our endo-atmospheric defensive capabilities, is on schedule to be certified and operational in the 2018-2019 timeframe. We

conducted a successful Critical Design Review in March 2016 for the SM-6 Dual II Sea-Based Terminal defense interceptor and will conduct missile and weapon system integration testing in 2017. The first intercept flight test supporting Sea Based Terminal Increment 2 is planned for first quarter of FY 2019.

We requested $335.3 million for the SM-3 Block IIA program, to include $9.7 million for the Cooperative Development effort with the Japan Ministry of Defense. This includes the continued integration of the SM-3 Block IIA into the BMD Weapon Systems as well as pre-production All-Up-Rounds to support the initial deployment for EPAA Phase 3. In December of 2015, a second SM-3 Block IIA controlled flight test was conducted to further test the Kinetic Warhead and Throttleable Divert and Attitude Control System. Then, in February 2017, we successfully conducted an intercept test (SFTM-01) with the SM-3 Block IIA that resulted in the intercept of the MRBM target. This success supports the initial production decision for the SM-3 Block IIA and the Aegis BL 9.C2 (BMD 5.1) certification effort. It was the first intercept by the SM-3 Block IIA from an Aegis BMD ship and the first use of the Aegis BL 9.C2 weapon system. We will conduct a second intercept test in the third quarter of FY 2017 (SFTM-02). Following that test, we will transition to testing the SM-3 Block IIA within the BMDS architecture with the upgraded Aegis Baseline 9 weapon system and BMD 5.1, for at sea and ashore deployment.

We conducted the operationally realistic FTO-02 E1a intercept test in December 2015. The Aegis Ashore Missile Defense Test Complex at PMRF fired the SM-3 Block IB missile to intercept and destroy an air-launched MRBM target. This operational flight test was the first to demonstrate an intercept using the Aegis Ashore test complex and demonstrated important modernization updates to the Aegis Weapon System. In FY 2018, we will continue our commitment to develop, test, and deliver global naval capability to the Warfighter and support

defense of our deployed forces and European NATO allies through supporting operational readiness of EPAA Phase 2 and delivery of Phase 3, which includes delivery of the Aegis Ashore site in Poland. MDA requested $59.7 million in procurement funds to address the multiple actions required to declare technical capability of the Aegis Ashore site in Poland by the end of the calendar year 2018, keep the individual components up to date with the Navy's destroyer modernization plan, and install modifications as required to enhance co-existence with Broadband Wireless Access systems in the European theater.

European Phased Adaptive Approach

We will continue to support the European Phased Adaptive Approach (EPAA) as a U.S. contribution to NATO BMD, providing coverage and protection of NATO European territory, populations, and forces against the increasing threat of ballistic missile proliferation in the Middle East. Our efforts to develop, test, and deploy EPAA capabilities enabled NATO Heads of State and Government to declare the achievement of NATO BMD Initial Operational Capability at the July 2016 Warsaw Summit.

Aegis Ashore-Romania is mission capable today. The U.S. Navy operates the site as an integral part of NATO's BMD architecture, which includes a forward-based AN/TPY-2 in Turkey, four BMD-capable Aegis destroyers homeported in Rota, Spain, SM-3 interceptors, and a command-and-control node operated from Ramstein Air Base, Germany.

EPAA Phase 3 will improve defensive coverage against medium- and intermediate-range threats with the deployment of a second operational Aegis Ashore site in Poland, equipped with the upgraded Aegis Baseline 9 weapon system with BMD 5.1 and capability to launch SM-3 Block IIAs. The new SM-3 variant will support the EPAA Phase 3 technical capability declaration. The Aegis Weapon System upgrades are further enhanced by spiral upgrades to the

C2BMC network and AN/TPY-2 sensors, enabling Engage on Remote capability and extended defensive coverage for NATO Europe. Aegis Ashore site construction in Poland began in FY 2016 and MDA will complete its technical capability declaration to meet Phase 3 commitments in the 2018 timeframe.

Command, Control, Battle Management, and Communications

We requested $430.1 million in FY 2018 for Command, Control, Battle Management and Communications (C2BMC). C2BMC provides persistent acquisition, tracking, cueing, discrimination, and fire-control quality data to Aegis BMD, GMD, THAAD, Patriot, and coalition partners to support homeland and regional defense. We continue to support Warfighter command, control and battle management needs across the globe by providing the Combatant Commander with the BMD planner, situational awareness tools, and battle management capability to support global BMD situational awareness, coalition operations, weapons release authority for homeland defense, and control and tasking of forward-based AN/TPY-2 radars. C2BMC operators and maintainers deploy forward in some of the world's hottest threat spots and continue to provide around-the-clock support to the local commanders.

In the third quarter of FY 2018 C2BMC Spiral 8.2-1 becomes operational in U.S. Northern Command and Pacific Command in support of Enhanced Homeland Defense. Spiral 8.2-1 is a complete hardware update to the C2BMC system that allows C2BMC to integrate data from multiple AN/TPY-2 radars, SBX, UEWR, Upgraded Cobra Dane, and the BMDS Overhead Persistent Infrared (OPIR) architecture. Enhancements include system raid size and tracking capacity increased by a factor of five and improved system Information Assurance/cybersecurity posture. We will complete testing and deployment of C2BMC Spiral 8.2-3 in support of Aegis BMD Engage-on-Remote functionality and EPAA Phase 3. We will continue development of

C2BMC Spiral 8.2-5 to support integration of the LRDR into the BMDS by 2021 to support a Robust Homeland Defense capability. Finally, we continue supporting incremental improvements to the BMDS to keep pace with emerging threats worldwide by investing in the development, integration and testing of advanced algorithms to improve track and discrimination capabilities and enhance the use of space based sensor data from sources such as the Space Based Infra-Red System (SBIRS), using the BMDS OPIR architecture.

Sensors

We are requesting $17.0 million for the Spacebased Kill Assessment (SKA) experiment. Using fast frame, infrared sensors, SKA will deliver an experimental kill assessment capability for GMD defense of the homeland as part of an integrated post intercept assessment solution requested in the FY 2014 NDAA. A network of SKA sensors is to be hosted on commercial satellites. Installation of the SKA payloads onto the host satellites started in December 2016 and will continue into 2017. The DoD/commercial collaboration has proceeded very smoothly and the full SKA network will be on orbit in FY 2018, according to the latest plans from the commercial host.

Also, we requested $34.9 million for continued operation of the Space Tracking and Surveillance System (STSS) and the Missile Defense Space Center (MDSC) in FY 2018. STSS satellites, which were launched in 2007, have far exceeded their life expectancy and have proven to be a very good investment. These satellites operate in low Earth orbit and continue to collect valuable test data. Both the STSS program and the MDSC are also supporting concept development activities for future space sensor architecture studies and analyses to address advanced threats.

The Services and COCOMs, with logistical support from MDA, operate forward-based X-band radars (AN/TPY-2 (Forward Based Mode)) in Japan, Israel, Turkey, and United States Central Command. The AN/TPY-2 (Forward Based Mode and Terminal Mode) radars contribute to regional defense and the defense of the U.S. homeland. For FY 2018, we are requesting $191.1 million to sustain COBRA DANE, the Upgraded Early Warning Radars, and the AN/TPY-2 fleet. MDA continues to support the seven AN/TPY-2 (Terminal Mode) radars delivered to THAAD batteries, including the forward deployed THAAD battery on Guam.

Developing New Capabilities

MDA is making critical investments in technology that we believe will significantly improve system performance and effectiveness. By improving reliability, enhancing discrimination, and expanding battle space, I believe we can reduce the cost per kill. We also need to investigate solutions that reduce reliance on expensive kinetic interceptors. MDA is developing technology to address gaps in the BMDS and dramatically drive down the cost of defending the homeland. With this budget request, we will invest in persistent discrimination in the BMDS sensor architecture, high power lasers, multi-object kill vehicles, and other breakthrough technologies.

MDA requested $5.5 million in Weapons Technology to conduct demonstrations of the technological foundation for a laser system capable of defeating advanced threats and raids more efficiently than existing missile interceptors. We made outstanding progress with high brightness, high efficiency electric laser research at Lawrence Livermore National Laboratory and MIT Lincoln Laboratory over the last several years. In FY 2018, our directed energy program completes key laser scaling and packaging tests at the laboratories and shifts the center of gravity

for our laser research from the laboratory to industry. Laser scaling continues under Technology Maturation Initiatives as part of our unmanned aerial vehicle (UAV)-borne laser program.

We requested $128.4 million for Technology Maturation Initiatives to build on the foundational successes in Weapons Technology and Discrimination Sensor Technology. MDA participated in the Pacific Dragon test campaign in June 2016 with two Reaper aircraft to support improving missile tracking capabilities during the boost phase. In addition, we successfully tested new advanced sensor technology from our ground test beds at MIT Lincoln Laboratory's Firepond facility and at the Mt. Wilson Aerospace facility, tracking objects at operational distances with unprecedented accuracy. In FY 2018 we will integrate an advanced sensor into the tactically proven Multispectral Targeting System and MQ-9 Reaper combination to address precision track of advanced threat weapon systems and discrimination performance of airborne sensors. MDA will continue the design and begin fabrication of a UAV-borne laser for boost phase missile defense. Adding a boost phase layer of sensors and weapons to the missile defense architecture could dramatically increase the performance and efficiency of the BMDS.

MDA requested $259.4 million for the Multi-Object Kill Vehicle (MOKV) Program to establish the technology foundation for killing multiple lethal objects from a single interceptor. The more kill vehicles we can put on an interceptor, the greater the raid capacity of our Ground-based Midcourse Defense system. Last year, through industry partnership, we developed concepts to destroy several objects within a threat complex with multiple kill vehicles deployed from a single interceptor. Based on three prime contractor defined kill vehicle concepts, MDA will invest in technology that reduces risk for the product development phase.

We requested $75.3 million for the Hypersonic Defense effort to execute the systems engineering process, identify and mature full kill chain technology, provide analysis and

assessment of target of opportunity events, and execute near term sensor and command and control capability upgrades to address defense from hypersonic threats. To address the hypersonic threat, MDA will perform sensor and weapon technology demonstrations from radars, high altitude drones and then in a space layer. This effort will execute the Defense Science Board's recommendations to develop and deliver a set of material solutions to address and defeat hypersonic threats informed by a set of near-term technology demonstrations. An integrated set of enhancements provides incremental capability measured by progress and knowledge points in the following areas: establishes systems engineering needs and requirements to identify alternative material solutions; executes a series of sensor technology demonstrations with small, inexpensive satellites including an overhead miniature sensor experiment for tracking to inform the development strategy; modifies existing BMDS sensors and C2BMC element for hypersonic threats; and defines weapon concepts and investments in key technology to enable a broad set of solutions including kinetic and non-kinetic means both right and left of launch. MDA will execute a series of ground, airborne, and space-based technology demonstrations tracking representative advanced hypersonic threats.

MDA requested $20.2 million for the Advanced Research Program to continue capitalizing on the creativity and innovation of the Nation's small business community and academia to enhance the Ballistic Missile Defense System. Advanced Research conducted research and material solution analysis to identify initiatives and technology to include missiles, sensors, and command and control components in the defense against current and future threats. Advanced Research successfully conducted the following tests: a series of structural bend and drop tests for the proposed SM-3 Block IIA lightweight unitary nosecone; a hot fire test for a long duration hot gas valve propulsion system; radiation source testing to improve radiation hardness

of optical components for kill vehicle seeker development; and demonstration of a new insulation material for thermal batteries to improve heat containment. We partnered with industry to develop a Kill Vehicle Modular Open Architecture compliant nanosat testbed for validating kill vehicle component technology. Additionally, we awarded 161 new Small Business Innovation Research and Small Business Technology Transfer contracts for innovative new research in such areas as, sensor resource management, mission assurance, modeling and simulation, big data processing and correlation, propulsion technology, and improved seekers. We conducted research projects with fourteen domestic universities in areas such as combustion instability, counterfeit parts detection, and systems of systems modeling. We are fostering cutting edge research between U.S. and foreign universities of allied nations through international cooperative technology development projects.

We requested $13.0 million for the Advanced Concepts & Performance Assessment effort, which centralizes advanced technology concept modeling, simulation, and performance analysis and delivers independent assessments of government, university, and industry technology concepts that, along with systems engineering requirements, support acquisition strategy decisions and define our technology focus areas.

International Cooperation

The FY 2018 budget request includes funding for regional missile defense capabilities to protect deployed U.S. forces, reassure allies and partners, and build cooperative regional security architectures. MDA has engagements with over twenty countries and international organizations and is committed to expanding work with our international partners, including joint analyses, partner missile defense acquisition decisions, cooperative research and development projects, deployment of BMD assets, Foreign Military Sales (FMS), and co-production efforts.

The investments of our allies and partners in their own missile defense capabilities allow us to build more effective regional security architectures that complement U.S. regional missile defense capabilities. We are currently executing an FMS case with the United Arab Emirates for two THAAD batteries, including launchers, radars, and interceptors. Both batteries have been delivered to the UAE, and Initial Operational Capability (IOC) has been declared for the first battery. Site construction for the second battery is ongoing. Once completed, IOC for the second battery is expected in summer 2017. MDA is actively engaged with several nations, particularly those in the Arabian Gulf region, to provide program information and cost data that may inform future decisions to procure THAAD and other missile defense systems. In 2016, MDA completed a Ballistic Missile Early Warning Study report for the Gulf Cooperation Council (GCC), analyzing sensor and C4I architecture options for defense of the region. We are continuing to discuss the study's findings with the GCC nations.

MDA works with the Israeli Missile Defense Organization (IMDO) in accordance with jointly signed international agreements, and we continue to have a very strong cooperative missile defense partnership with Israel. This budget continues MDA's longstanding support of the U.S.-Israeli Cooperative BMD Programs, to include the co-development and co-production of the David's Sling Weapon System and Upper Tier Interceptor, and improvements to the Arrow Weapon System. Over the past year, IMDO and MDA successfully completed the fifth series of tests of the Stunner Interceptor for the David's Sling Weapon System. Additionally, IOC was declared for Arrow 3 in January 2017 and for David's Sling Weapon System in April 2017. The Department also continues to support coproduction efforts for the Iron Dome program to provide critical defense against short-range rockets and artillery.

We are making significant progress with our Japanese counterparts on the SM-3 Block IIA, our largest co-development effort. The development work and follow-on production efforts, which remain on track for first delivery of the missile in the 2018 timeframe, will support extended deterrence to our friends and allies and establish an important vehicle for closer defense cooperation ties. The United States will deploy the SM-3 Block IIA to the fleet and at Aegis Ashore sites to improve and expand defenses against MRBM and IRBM threats. We are committed to delivering the SM-3 Block IIA to meet global threat requirements and support EPAA Phase 3.

Cybersecurity

The Missile Defense Agency is cognizant of the growing cyber threat and we are aggressively working to ensure the Nation's missile defenses are resilient and able to operate in a highly contested cyber environment. We continue to improve the cyber hygiene of our missile defense capabilities by ensuring the cybersecurity infrastructure has the latest security upgrades and patches. MDA remains focused on supporting the DoD Cybersecurity Campaign through implementation of the DoD Cybersecurity Discipline Implementation Plan - Four Lines of Effort for: Strong Authentication, Hardening of Systems, Reducing the DoD Attack Surface, and Alignment to Cybersecurity / Computer Network Defense Service Providers across all networks. These four lines of effort are critical to the defense of the MDA networks.

In addition to the four lines of effort, MDA has determined that protection of the nation's BMDS unclassified data requires further safeguards and enhanced vigilance. As part of these safeguards, MDA has engaged with our defense industrial base corporate partners to ensure cybersecurity is addressed and enforced at all levels of the supply chain. These measures include industry cybersecurity best practices as well as techniques for providing only the need-to-know

unclassified BMD system data to each level of the supply chain. We continue to address industry compliance with applicable DFARs clauses associated with the protection of critical MDA controlled unclassified information/data.

Not only are we focused on external threats to our enterprise, but MDA acknowledges the reality of the insider threat as one of the more pervasive threats we face, and we have established and implemented an aggressive Agency Insider Threat Program. This allows us to monitor both internal and external data movement to ensure all unclassified and classified data is handled in accordance with applicable guidance and is afforded the highest level of protection. We are constantly evaluating our attack data and updating the MDA Emergency Response Team procedures. Abnormalities or violations are quickly identified and thoroughly investigated by both MDA and DoD Insider Threat and Counter Intelligence.

Finally, MDA is actively integrating cybersecurity requirements early into the acquisition life cycle to increase security and reduce cost. For example, we are upgrading C2BMC and the GMD ground systems software and hardware to enable enhanced cybersecurity protection capabilities. To better support our Combatant Commands we are planning for more realistic BMD system level cybersecurity testing in the upcoming ground test campaign and incorporating cybersecurity into future wargaming and exercises as well as more realistic cybersecurity testing for our RDT&E systems. We continue to develop a culture of cybersecurity knowledge and accountability across the agency, which fosters awareness down to the user level to anticipate, detect, and respond to cyber issues before they have an impact.

Conclusion

Mr. Chairman and Members of the Subcommittee, in closing, our budget request for Fiscal Year 2018 will continue to increase the capability and capacity of fielded homeland and

regional missile defense systems and make measured investments in advanced technology to reverse the adversary's numerical advantage. I also would like to recognize the brave men and women who serve in our Armed Forces at home and abroad and who operate the BMDS. Their professionalism and dedication to excellence in the performance of the missile defense mission are unmatched in the world. Our Nation is fortunate to have such a capable fighting force.

I look forward to answering the committee's questions. Thank you.

Vice Admiral James D. Syring
Director, Missile Defense Agency

Vice Admiral James Syring is from Muncie, Indiana. A 1985 graduate of the United States Naval Academy with a Bachelor of Science degree in Marine Engineering, he received his commission as an ensign. Subsequent to commissioning, he was designated an engineering duty officer. In 1992, Syring earned his Master of Science degree in Mechanical Engineering from the Naval Post Graduate School.

Ashore, Syring served in numerous engineering duty officer assignments including: ship superintendent for USS Port Royal (CG 73); Aegis test officer for new construction DDG 51 class ships; combat systems, test and trials officer in the DDG 51 Aegis Shipbuilding Program Office; Combat Systems Baseline manager in the Aegis Technical Division; director for Surface Combatants, Office of the Assistant Secretary of the Navy (Research, Development and Acquisition). Syring served as the technical director for the U.S. Navy's DDG 1000 Shipbuilding Program and followed that tour as the DDG 1000 major program manager.

Upon selection to flag rank in 2010, Syring served as the program executive officer for Integrated Warfare Systems, responsible for acquiring, developing, delivering and sustaining integrated weapons systems for ships, submarines, carriers and aircraft within the Fleet and Joint Force.

In November 2012, Vice Admiral Syring became the 9th director of the Missile Defense Agency (MDA), Office of the Secretary of Defense, Pentagon, Washington, D.C. In this capacity, he oversees the MDA's worldwide mission to develop a capability to defend deployed forces, the United States, allies, and friends against ballistic missile attacks.

Syring's personal awards include the Distinguished Service medal, Legion of Merit (2 awards), the Meritorious Service medal (4 awards), Navy and Marine Corps Commendation medal, and Navy and Marine Corps Achievement medal.

Updated: 20 November 2014

RECORD VERSION

STATEMENT BY
LIEUTENANT GENERAL JAMES H. DICKINSON, USA
COMMANDING GENERAL,
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/
ARMY FORCES STRATEGIC COMMAND
AND
JOINT FUNCTIONAL COMPONENT COMMAND FOR
INTEGRATED MISSILE DEFENSE

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENATIVES

FIRST SESSION, 115TH CONGRESS

FISCAL YEAR 2018 BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS AND ACTIVITIES

JUNE 07, 2017

NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES

Lieutenant General James H. Dickinson, USA
Commanding General
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command
and
Joint Functional Component Command for
Integrated Missile Defense

Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Subcommittee, thank you for your continued support of our Service Members, Civilians, and Families. I appear before you today bringing both a Joint and Army perspective on effective missile defense capabilities. Let me express my appreciation to this Subcommittee for its continued support of the Army, the U.S. Strategic Command, the Department of Defense, and the missile defense community. I am honored to testify before this Subcommittee along with these distinguished witnesses who provide missile defense capabilities to our Nation, forward deployed forces, partners, and allies.

As outlined by my predecessors during appearances before this subcommittee, my responsibilities encompass several main areas. First, as the Commander of the U.S. Army Space and Missile Defense Command (USASMDC), I have Title 10 responsibilities to organize, train, and equip space and global ballistic missile defense forces for the Army. As Commander of USASMDC, I also serve as the Army's force modernization proponent for space, global ballistic missile defense, and high altitude forces and capabilities. Second, as the Commander, Army Forces Strategic Command (ARSTRAT), I am the Army Service Component Commander (ASCC) to the U.S. Strategic Command (USSTRATCOM). I am responsible for planning, integrating, coordinating, and providing all Army space and missile defense forces and capabilities in support of USSTRATCOM missions. Third, as the Commander of USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), I am responsible for synchronizing missile defense planning, conducting ballistic missile defense operations support, recommending allocation of missile defense assets, and advocating for missile defense capabilities on behalf of the Combatant Commanders.

Lastly, I serve as the Army's Air and Missile Defense (AMD) Enterprise Integrator. My responsibility is to synchronize the balanced execution of the Army's

AMD strategy across the functions of force planning and sourcing requirements, combat and materiel development, AMD acquisition and life cycle management, and to orchestrate consistent strategic communication messaging themes.

In accordance with these responsibilities, my intent today is to highlight our greatest asset—our people; to briefly outline the strategic environment; to emphasize USASMDC/ARSTRAT's missile defense force provider responsibilities with respect to the Army and the Geographic Combatant Commanders (GCCs); to outline JFCC IMD's role as an operational integrator of Joint missile defense for USSTRATCOM; and finally to summarize a few of the key Army air and ballistic missile defense activities and developments in the context of a comprehensive approach to addressing an evolving air and missile threat.

The Workforce—Recognizing and Protecting Our Greatest Asset

The challenges that we face cannot be addressed without the dedication of our greatest asset—our people. I feel it is important to highlight our workforce and my concern of potential future year sequestration on our workforce. At USASMDC/ ARSTRAT and JFCC IMD, our people remain our greatest asset. The Service Members, Civilians, and Contractors support the Army and Joint Warfighter each and every day, both those stationed in the homeland and those globally deployed. We remain committed to providing trained and ready Service Members and Civilians to operate and pursue advancements of space and missile defense capabilities for the Nation.

The Evolving Threat

Current global trends indicate ballistic and cruise missiles are becoming more complex, due in part to the proliferation of advanced technologies, resulting in systems with greater ranges and accuracy. Additionally, many foreign ballistic and cruise missile systems are progressively incorporating advanced countermeasures including maneuverable reentry vehicles, multiple independent reentry vehicles, electromagnetic jamming, and hypersonics, with the purpose of defeating our ballistic missile defense systems. Moreover, ballistic and cruise missile platforms are increasing quantitatively,

and as most are mobile field-based systems, are decreasing our ability to detect and track these systems before they are launched.

Numerous countries are developing ground-, sea-, and air-launched land-attack cruise missiles utilizing an assortment of unconventional and inexpensive launch platforms. Presently, nearly 30 countries possess ballistic missile capability and some are actively pursuing hypersonic weapons. There are approximately 50 different variants of ballistic missiles with 13 new intermediate-range and eight intercontinental ballistic missiles (IRBM and ICBM) variants under development. As an example, in recent months, North Korea has conducted an unprecedented number of test launches of systems, some of which may be capable of reaching Guam and the Aleutian Islands.

"....Iran presents several credible threats. They have a robust theater ballistic missile program...."

-- USCENTCOM Posture Statement March 2017

In the future, our missile defense systems will encounter more complex electronic and cyber-attacks and will also need to combat directed energy capabilities that could significantly degrade U.S. missile defense operations. Also, we expect cyber- and electronic-attacks will increasingly be part of an adversary's anti-access/area-denial (A2/AD) strategy. Enhancing our ability to successfully counter these continuously advancing threats lies in the increased use of space and space enabled capabilities. Improved and additional space sensors will expand our capacity to track, discriminate, and successfully engage threat ballistic and hypersonic missiles.

To meet the objectives of the current Quadrennial Defense Review, USSTRATCOM and the Army continue to provide and enhance homeland and regional missile defense. In accordance with the Department's strategy to rebalance to the Asia-Pacific region, we have worked with partners in U.S. Pacific Command (USPACOM), U.S. Northern Command (USNORTHCOM), and USSTRATCOM to review and improve our capabilities in the USPACOM area of responsibility. In addition to the deployment of the Terminal High Altitude Area Defense (THAAD) battery in Guam and the two forward-based sensors in Japan to bolster our regional and homeland defense capabilities, we are re-stationing a THAAD battery to Korea as part of the Republic of

Korea and United States alliance. We are now working with our host nation counterparts to operationalize the unit this calendar year. To minimize costs, we plan to position the unit's supporting infrastructure within an existing U.S. Army Garrison Korea footprint. Finally, the Army has approved a sixth Air Defense Artillery (ADA) Brigade headquarters that will be stationed in PACOM in Fiscal Year 2019.

The emplacement of 14 additional Ground-Based Interceptors (GBIs) at Fort Greely, Alaska, scheduled for completion in 2017, and the addition of an Inflight Interceptor Communications System Data Terminal at Fort Drum, New York, provide improved capability and capacity to defend the Nation against an ICBM attack from both North Korea and Iran. With the additional 14 interceptors, the Nation will have a total of 44 GBIs by the end of this calendar year. In addition, we continue to work with regional partners and allies to increase our information and data sharing and develop a global AMD force posture that leverages ever growing partner nations' capabilities. This will result in reduced strain on our force and enable more timely modernization of our AMD assets.

The Quadrennial Defense Review also establishes a priority to maintain a strong commitment for security and stability in Europe, the Asia Pacific region, and the Middle East. In conjunction with our allies and partners, the DoD continues to maintain forward committed PATRIOT, THAAD, and Counter Rocket, Artillery and Mortar (C-RAM) air and missile defense forces in order to enhance our current AMD posture while sending a strategic deterrence message to potential adversaries. The scope and quantity of these deployments result in a highly deployed and stressed Army AMD force. We must seek to balance today's operational requirements with shaping the force to counter future challenges. Our efforts must also include the critical modernization of our AMD force over the next five years.

> ***"...initiate a new Ballistic Missile Defense Review to identify ways of strengthening missile-defense capabilities, rebalancing homeland and theater defense priorities, and highlighting priority funding areas."***
>
> **--National Security Presidential Memorandum**
> ***January 2017***

In summary, adversary air and missile threats continue to develop in complexity and capacity. The evolution of capability advancements requires a holistic approach that effectively integrates offensive and defensive, passive, kinetic and non-kinetic, and alternative capabilities to defeat air and missile threats. The growing complexity of the strategic environment based on technological advances of the threat and fiscal realities requires cost effective methods to integrate current and future capabilities. We continue to prioritize integrated air and missile defense resources to optimize our capabilities in support of the Warfighter, particularly in light of the expense associated with traditional approaches. We continue to partner with the Missile Defense Agency (MDA), Combatant Commands, and Services to pursue a fiscally responsible path to address the evolving threats by identifying and prioritizing capabilities that provide the greatest operational value.

Providing and Enhancing Missile Defense Capabilities

USASMDC/ARSTRAT, a force provider of missile defense capabilities, is manned by multi-component Soldiers, Civilians, and Contractors. Commands around the world, including USSTRATCOM, USNORTHCOM, and the GCCs, leverage our capabilities. Our Title 10 responsibilities include operations, planning, integration, control, and coordination of Army forces and capabilities in support of USSTRATCOM's missile defense mission. USASMDC/ARSTRAT also serves as the Army's global operational integrator for missile defense, the Army's proponent for global ballistic missile defense force modernization, and the Army's technical center lead to conduct air and missile defense related research and development in support of Army Title 10 responsibilities. As the Army AMD Enterprise Integrator, our tasks include working across the AMD community of interest to balance priorities, informing resourcing decisions, and pursuing innovative approaches in order to enhance our strategic flexibility. The AMD Enterprise remains

"…develop a state-of-the-art missile defense system to protect against missile-based attacks. …"

-- POTUS Statement
Making Our Military Strong Again
January 2017

focused on meeting operational demands and AMD modernization initiatives. It is imperative that we achieve the correct balance of fiscal and force structure resources for today's operational requirements and the continued development and implementation of tomorrow's AMD capabilities. Collectively, the conduct and integration of these roles help to set conditions for the protection of GCCs and Joint Warfighters while maintaining their freedom of action, providing the ability to build and project combat power, and assuring access to the global commons.

Our operational function is to provide trained and ready missile defense forces and capabilities to the GCCs and the Warfighter—in other words, to address the requirements of today. For example, USASMDC/ARSTRAT Soldiers serving in the homeland and in remote and austere forward deployed locations operate the Ground-based Midcourse Defense (GMD) system and the Army-Navy/Transportable Radar Surveillance Forward-Based Mode (AN/TPY-2 FBM) radars. Highlights of the capabilities provided by our missile defense professionals include:

Support to Global Ballistic Missile Defense: Soldiers from the 100th Missile Defense Brigade, headquartered in Colorado Springs, Colorado, and the 49th Missile Defense Battalion, headquartered at Fort Greely, Alaska, remain ready, 24/7/365, to defend our Nation and its territories from an intercontinental ballistic missile attack. Under the operational control of USNORTHCOM, Army National Guard and active component Soldiers operate the Ground-based Midcourse Defense Fire Control Systems located at the Fire Direction Center in Alaska, the Missile Defense Element in Colorado, and the GMD Command Launch Element at Vandenberg Air Force Base, California. These Soldiers, in conjunction with USNORTHCOM, also oversee the maintenance of GMD interceptors and ground system components. At the Missile Defense Complex at Fort Greely, a remote site with limited community support amenities, 49th Missile Defense Battalion military police secure the interceptors and command and control facilities from physical threats. Considering the strategic mission, the remote location, the very harsh environment, and the 20-hours per day of winter darkness, we must continuously review and enhance the Fort Greely Garrison services and support to the Soldiers, Civilians, Contractors, and their Families. I request your

continued assistance with ensuring these remotely stationed personnel are provided adequate housing, medical, educational, and family support facilities and services.

In March 2016, the Army completed its Title 10 responsibilities and, in conjunction with USNORTHCOM, declared the In-flight Interceptor Communications System (IFICS) Data Terminal (IDT) at Fort Drum, New York operational. In addition to increasing the overall effectiveness of the GMD System, the Nation's only active defense against an ICBM attack, the IDT greatly enhances the coverage and protection of the Eastern U.S.

GMD System Test and Development: Soldiers from the 100th Missile Defense Brigade actively participate in GMD test activities and continue to work with MDA developers on future improvements to the GMD system. The rigorous testing regime of MDA, conducted through their series of operational flight as well as ground-based tests, emphasizes operational realism during test design and execution. Therefore, in addition to gaining test data and insight, Soldiers of the 100th Missile Defense Brigade gain tremendous training value by executing their actual responsibilities while providing Warfighters with confidence the system will perform as designed in support of their Joint operations.

Support to Regional Capabilities: The 100th Missile Defense Brigade also provides GCCs with trained and certified AN/TPY-2 FBM radar detachments. These operational capabilities exist today at five strategic locations around the globe where they contribute to the early warning, cueing, tracking, and discrimination of threats to our friends and allies. These forward-based radars also represent a tangible contribution to both homeland and regional defense that is the centerpiece of the European Phased Adaptive Approach (EPAA) for missile defense. Soldiers manning these radars, deployed to remote and austere locations across the globe, are a persistent demonstration of our national commitment and resolve to defend deployed forces, allies, and friends from ballistic missile attacks.

Ballistic Missile Early Warning: Space enabled capabilities are essential for missile defense operations. Everything from communications, precision navigation and timing, intelligence, surveillance, reconnaissance, and early warning are dependent on space enabled capabilities. Through the Joint Space Operations Center, we routinely

coordinate and collaborate with the USSTRATCOM Joint Functional Component Command for Space to ensure resilience of the space architecture that forms the backbone of the missile defense joint kill chain.

In support of the Joint Force Commander, USASMDC/ARSTRAT continues to provide ballistic missile early warning within the U.S. European Command (USEUCOM), the U.S. Central Command (USCENTCOM), and the USPACOM theaters of operations. The 1st Space Brigade's Joint Tactical Ground Station (JTAGS) Detachments, under the tactical control of USSTRATCOM's Joint Functional Component Command for Space, are operated by USASMDC/ARSTRAT space-professional Soldiers who monitor launch activity and other infrared events. They provide essential information to members of the air, missile defense, and operational communities. Our JTAGS Detachments are forward deployed around the globe, providing 24/7/365, dedicated, assured missile warning to USSTRATCOM and GCCs in support of deployed and forward-based forces. We continue to optimize this capability and this year we gained support from the Government of Italy to relocate the JTAGS in Europe to Sigonella Naval Air Station which increases operational capability.

Missile Defense is Inextricably Linked to Capabilities Derived from Space-Based Assets

Our second major task is to build and mature future missile defense forces—our capability development function. These are the missile defense capabilities we will provide tomorrow. A major component of our capability development function is to provide relevant and updated training on our global missile defense systems. During the past fiscal year, USASMDC/ARSTRAT trained approximately 200 Soldiers that provide homeland defense and was recertified as an Army Learning Institution of Excellence for missile defense training.

The Army uses established and emerging processes to document its missile defense needs and pursue Joint and Army validation of its requirements. As a recognized Army Center for Analysis, USASMDC/ARSTRAT conducts studies to determine how to best meet the Army's assigned missile defense responsibilities. With these insights, we develop and operationalize the Doctrine, Organization, Training,

Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) capabilities to address evolving threats and potential vulnerabilities to the GMD and AN/TPY-2 FBM missile defense systems. This disciplined approach helps to ensure limited resources are applied where Warfighter operational utility can be most effectively served.

Our third major missile defense task provides critical technologies to address future needs that will enhance Warfighter effectiveness—our materiel development function. In USASMDC/ARSTRAT, our technology development function is primarily focused on the space and high altitude domains. However, while MDA is the principal materiel developer for ballistic missile defense capabilities, USASMDC/ARSTRAT has a number of supporting missile defense related materiel development efforts, to include supporting research and development of an OSD-sponsored conventional prompt strike capability. These technical capabilities are at the forefront of developing holistic, cost-effective approaches to address the missile defense challenge. The following is a brief summary of two of our research and development efforts, as well as an overview of the capabilities of an essential Army testing range.

Providing Future Warfighters with Innovative Missile Defense Capabilities

High Energy Laser Technology Development and Demonstration: The objective of the Army's high energy laser science and technology effort is to develop ruggedized laser system components, integrate them onto an Army vehicle, conduct demonstrations to characterize performance, and to transition the technology to a Program Executive Office. A solid-state laser weapon system has the potential to be a low-cost and effective complement to kinetic energy capabilities in countering rockets, artillery, and mortars (RAM), unmanned aerial systems (UASs), and other threats. The effort is building upon 2013 and 2014 pathfinder demonstrations of a 10 kilowatt-class laser system by continuing to develop, integrate, and mature the technology at higher laser power outputs. The next key knowledge point will occur in 2018 following integration of a 50 kilowatt-class laser system onto a High Energy Laser Mobile Test Truck (HEL MTT). In 2015, the Army Science and Technology Working Group approved changes to the high energy laser demonstrator effort to better align with the

Army's Indirect Fire Protection Capability Increment 2-Intercept (IFPC Inc 2-I) program. These changes will result in a prototype laser weapon system demonstration, on a variety of medium tactical vehicles, in the early 2020s. The intent is for the High Energy Laser Tactical Vehicle Demonstrator to meet counter-RAM requirements in the IFPC Inc 2-I Capability Development Document.

Low-Cost Target Development: The Army continues to pursue a technology effort to develop a suite of low-cost targets for the Patriot testing program. The intent is to design threat-representative targets at a substantially reduced cost for short-range ballistic missile testing. Over the past year, we completed detailed designs for three new short range ballistic missile targets leveraging existing excess solid rocket motors. In December 2016, we conducted the successful launch of the Zombie Pathfinder Target at White Sands Missile Range, New Mexico. This test provided verification of a new target design. The new target was launched off a Transportable Target Launcher platform, proved remote launch capability, achieved all performance metrics, and served as risk reduction for the dual launch Sabre (short range ballistic missile) targets in support of the upcoming June 2017 PATRIOT operational tests. Development of a two stage ballistic missile target, known as Black Dagger, continues with a risk reduction launch scheduled for early 2018. The goal of the Black Dagger target is to mimic a broader range of short range ballistic missile threats by achieving longer range, higher altitude, and increased velocity.

Missile Defense Testing: USASMDC/ARSTRAT operates the Ronald Reagan Ballistic Missile Test Site (RTS). RTS, located on the U.S. Army Garrison—Kwajalein Atoll in the Republic of the Marshall Islands, is critical to both offensive and defensive missile testing requirements, such as the GMD system and the U.S. Air Force strategic ballistic missile systems. With regards to missile defense testing, RTS recently supported MDA's Flight Test Operational-02 Event 2 (FTO-02E2) and Ground-Based Midcourse Defense Controlled Test Vehicle-02+ (GM CTV-02+). FTO-02E2 demonstrated the ability of the Aegis Ballistic Missile Defense (BMD) and THAAD systems to defeat a raid of three near-simultaneous air and missile targets. GM CTV-02+ demonstrated the improved alternate divert thruster system of the GBI's Exo-atmospheric Kill Vehicle. These regional and homeland defense tests have grown ever

more challenging and complex over the years, providing a means to replicate theater missile defense architectures superimposed over these Pacific test sites. Through efficient resource investments, RTS retains preeminent missile defense testing capabilities and personnel to continue to provide critical testing support. In concert with its testing mission, RTS conducts continuous deep space surveillance and space object identification operations to further increase national capabilities and reduce expenditures for both mission sets. During the past year, the U.S. Air Force began construction of their most advanced surveillance system—Space Fence. In a few years, this improved surveillance capability will enable proactive space situational awareness while complementing existing systems at the RTS.

Army Contributions to the Nation's Missile Defense Capabilities

As we transition from an Army at war to one of deterrence, air and missile defense (AMD) units have become a key strategic enabler. AMD is an enduring Army core function and an essential component of the Army mission to provide wide area security and support to Joint campaigns. In addition to defense against ballistic missiles, the current Army AMD strategy seeks to develop a more comprehensive portfolio of Integrated Air and Missile Defense (IAMD) capabilities. The Program Executive Office for Missiles and Space (PEO M&S) is the Army's materiel developer for these capabilities and works closely with the other Services, the Joint Staff, and MDA toward Joint Integrated Air and Missile Defense capabilities. To ensure the mission of providing trained and ready Army AMD forces, we continue to refine and implement the strategic direction of the Army's AMD strategy. A summary of the Army's major air and missile defense ongoing strategic direction and programs follows:

Air and Missile Defense Readiness: Readiness remains the Army's top priority and the challenge to sustain the readiness of the total Army AMD forces requires constant vigilance and senior leader focus. The operational demand on the Army AMD force to meet the requirements of the Joint Warfighters continues to stress the force, impacting both current and future readiness, as well as modernization initiatives. With over 50 percent of the AMD force either forward stationed or deployed, the Army has taken steps to mitigate this stress to the force and restore strategic flexibility.

Implementation of a Sustainable Readiness Model, an Army Campaign Plan strategic effort, supported the characterization of the challenge. A recent study on striking a balance between operational demand and modernization led to the activation of an AMD test detachment in Fiscal Year 2018. This same study supported normalization of AMD rotations to nine months vice the current 12 month cycle—we expect to achieve the shorter rotation cycle in the near future.

Mission Command: Closely linked to the challenge of sustaining AMD readiness is the ability to provide low density/high demand AMD mission command elements. The mission command elements are especially critical to support the integration of the total Army AMD forces into Joint command and control architectures. Operationally, the Army recently activated a third National Guard Air Defense Brigade Headquarters assigned to the South Carolina Army National Guard to support mission command rotations for the integrated air defense mission of the National Capital Region. Additionally, a sixth active duty air defense brigade headquarters will soon be activated in USPACOM. Beginning next fiscal year, the Army will complete the development and procurement of five Dismounted PATRIOT Information Coordination Centrals (DPICC) for the Army Air and Missile Defense Commands (AAMDC), which will mitigate the requirement to deploy a Patriot Battalion Headquarters element with each 1-2 battery deployment. These operational measures are being conducted in concert with technical measures, specifically the development of the Army IAMD Battle Command System (IBCS).

Army Integrated Air and Missile Defense (AIAMD): With the continued growth of the regional ballistic missile threats, AMD units remain a key strategic enabler. In addition to providing defense against ballistic missiles, the current AMD strategy continues to develop a more comprehensive portfolio of AIAMD capabilities to provide protection against other adversary threat systems and capabilities.

The IBCS will provide integrated fire control of AMD sensors and shooters and provide additional time to prosecute tracks to enhance selective target engagement and improve combat identification. IBCS remains an Army priority effort and serves as the foundation for Army AMD modernization. Modernization is critical to stay ahead of the advancement of the threat. The program will field a common mission command system

for Army AMD forces in order to defend against cruise missiles, manned and unmanned aircraft, air-to-ground missiles, tactical ballistic missiles, and RAM attacks. The IBCS network will be capable of interoperating with air surveillance and fire control capabilities across Services and with coalition partners that provide Joint Warfighters with more decision space and lethality. When fielded, IBCS will enhance the lethality of the AMD force, breaking the current system-centric control paradigm, which will dramatically increase capability and also facilitate open industry competition in support of the AMD community. Additional efforts are currently underway to integrate the Army's IBCS and MDA's BMD System Command, Control, Battle Management, and Communications (C2BMC) in order to fully support integrated air and missile defense interoperability with the ballistic missile defense system.

The IBCS and indirect fire protection efforts will provide the future force with a capability to defend against cruise missiles, unmanned aerial systems, and long-range precision rockets, artillery, and mortars. However, the Army also must be trained and ready to fight tonight. Recent conflicts, for example in the Ukraine and the Mideast, highlight the growing threat of UAS in support of tactical operations. They pose an increasing risk to the Army's combined arms team who are operating where the strategic and operational advantage of highly technical stand-off weapons have limited utility. A coordinated effort involving the Army Staff, the Fires Center, PEO M&S, and select ASCCs is underway now to investigate approaches to enable the Army to fight tonight against these emerging threats.

PATRIOT/PATRIOT Advanced Capability-3 (PAC-3): The Army PATRIOT force remains the cornerstone of AMD protection for our deployed forces, friends, and allies. The GCCs increasing air and missile defense requirements ensure that the operational tempo and stress on the PATRIOT force remain high. To meet these requirements, reduce stress, and avoid adversary overmatch, the Army is improving PATRIOT capability against the near term evolving threat while we move toward the IBCS architecture including IFPC and a new Lower Tier Air and Missile Defense Sensor (LTAMDS).

PATRIOT must continually modernize through software and hardware upgrades to avoid obsolescence and to take advantage of the expanded battle space afforded by

the PAC-3 MSE interceptor. To counter the near term threat, the Army is in the process of delivering the next PATRIOT software build, Post Deployment Build (PDB-8). PDB-8 software enables integration with IBCS, provides combat identification enhancements, addresses upper tier debris mitigation, improves performance of the PAC-3 Missile Segment Enhancement (MSE) interceptor, and enhances Patriot and THAAD interoperability. To support recapitalization of the 35th Air Defense Artillery Brigade, PBD-8 Urgent Materiel Release (UMR) was approved in July 2016. Initial Operational Test & Evaluation (IOT&E) began in September 2016. The PDB-8 Materiel Release is planned for early 2018.

Finally, we will continue our commitment to balancing modernization with operational demand and strategic flexibility requirements. This will enhance our ability to stay ahead of rapidly evolving threats while meeting warfighting demands. We point to the Army's recent exercise deployment, integration, and redeployment of the Patriot Global Response Force from Ft Bliss, Texas to South Korea as evidence of this commitment and of the readiness of the Army's PATRIOT force.

Lower Tier and Missile Defense Sensor (LTAMDS): The LTAMDS program will provide the required sensing capabilities for Lower Tier Air and Missile Defense. LTAMDS will operate on the integrated fire control network and address critical capability gaps, modernize technology, reduce operation and sustainment costs, mitigate obsolescence, and increase reliability and maintainability. LTAMDS will be procured through a full and open competition acquisition strategy with the objectives of addressing existing and future capability gaps and threats, improving reliability, and reducing sustainment costs.

Terminal High Altitude Area Defense System: THAAD, a key component of the BMDS architecture, is designed for area defense of deployed and allied forces, population centers, and critical infrastructure against short- and medium-range ballistic missiles. THAAD is a high demand, low-density asset that is mobile and globally transportable. A fully operational THAAD battery consists of 95 Soldiers, an AN/TPY-2 radar, six launchers, a fire control and communications element, a battery support center, and a support element. THAAD has a unique intercept capability in both the endo- and exo-atmosphere using proven hit-to-kill technology. There are now five

available THAAD batteries. Fielding is ongoing for the sixth and seventh batteries and both will be operational by the end of 2018. In April 2013, one of these batteries conducted the first-ever operational deployment of THAAD in response to the escalation of tensions in the Pacific region. We are deploying another THAAD battery this year to the Republic of Korea in response to the increasing nuclear and missile threat posed by North Korea. A new training facility, which enables virtual training for the Soldiers who will operate the THAAD system, is active at Fort Sill, Oklahoma. The addition of THAAD capabilities to the Army's air and missile defense portfolio brings an unprecedented level of protection against missile attacks to deployed U.S. forces, partners, and allies.

Indirect Fire Protection Capability Increment 2 – Intercept Block 1 (IFPC Inc 2-I): As the operational life cycle of short-range AMD capabilities such as Avenger draw to a close, the Army is developing capabilities to defeat air, cruise missile, UAS, and RAM threats. The IFPC Inc 2-I, currently under development, is a mobile, ground-based weapon system designed to provide 360-degree protection capability for these threats. A block acquisition approach is being used to provide this essential capability. The Block 1 baseline system, consisting of an existing interceptor and sensor and utilizing the IBCS for integrated fire control, will include a multi-mission launcher to support the counter UAS and cruise missile defense missions. An engineering demonstration of the IFPC system was successfully completed in March 2016 which included the effective utilization of four different interceptors. The program underwent its Milestone B (MS B) Army Systems Acquisition Review Council (ASARC) review late last year. The program will enter the Engineering Manufacturing and Design phase upon receipt of the MS B Acquisition Decision Memorandum (ADM). Fielding of the Block 1 baseline counter-UAS/Counter-cruise missile capability is slated to begin in Fiscal Year 2020. Additionally, as part of the Block 1 program, a second missile will be added to provide an initial counter-RAM capability beginning in Fiscal Year 2022. The Block 2 System will provide a full counter-RAM capability by integrating additional capabilities to support the counter RAM mission. A full counter-RAM capability could be achieved by Fiscal Year 2028 for a kinetic energy solution and by Fiscal Year 2032 for a directed energy weapon.

Short-Range Air Defense (SHORAD): As short range air threats increase, the Army is increasing capabilities to address these threats to our deployed forces and allies. The Army is currently executing plans to expand SHORAD capabilities, not only with additional forces but also with new equipment, especially in the European theater. Increasing the SHORAD force is a reversal of a decade long decline in SHORAD personnel. While the current SHORAD systems, Avenger and Stringer missiles, provide capabilities for today's threat, continued advancement in our adversary's capabilities requires the development and fielding of more advanced systems. In addition to IFPC, continued research and development investments in lasers, high power microwaves, and electronic warfare are essential to increase SHORAD capabilities in support of the maneuver force.

> ***"We lack the capability and capacity to meet the AMD demands of the combatant commanders to cover key fixed sites and provide effective AMD protection of the maneuvering forces."***
>
> ***--Army G3/G8 HASC TALF Subcommittee Written Statement March 2017***

Joint Functional Component Command for Integrated Missile Defense—Synchronizing Global Missile Defense Planning, Force Management, Operations Support, Warfighter Advocacy, and Conducting Training and Education

The Joint Functional Component Command for Integrated Missile Defense, or JFCC IMD, is USSTRATCOM's missile defense integrating element. Like the other Joint Functional Component Commands, JFCC IMD was formed to operationalize USSTRATCOM missions and allow the headquarters to focus on integration and advocacy. Headquartered at Schriever Air Force Base in Colorado Springs, Colorado, the JFCC IMD is manned by professional Army, Navy, Air Force, Marine Corps, Civilian, and Contractor personnel.

As the Secretary of Defense and various Combatant Commanders have previously testified, the Warfighter remains confident in our ability to protect the Nation against intercontinental ballistic missile attack, but we need to continue our investments in missile defense technology to keep pace with the rapidly evolving threat. JFCC IMD's principal mission is to collaborate and support the joint Warfighters at the Geographic Combatant Commands (GCCs) and the materiel developers in MDA and the Services. On behalf of the GCCs and USSTRATCOM, JFCC IMD champions the Warfighters' priorities and capability needs, including the development of the Long Range Discrimination Radar in Alaska, development of the Redesigned Kill Vehicle (RKV) for the Ground-Based Interceptor (GBI), key regional missile defense capabilities, and various other improvements in the global missile defense capability.

Defense of the Homeland Priority Requires Execution of a Holistic Global Missile Defense Plan

JFCC IMD is working across the DoD enterprise and with key allied and partner nations to improve the integration of existing capabilities in order to maximize our efficiency and effectiveness to protect the homeland, deployed forces, partners, and allies. The key force multiplier is "integration," which is a critically important mission area for JFCC IMD and directly supports USSTRATCOM's assigned Unified Command Plan (UCP) responsibilities for missile defense. As a functional component command of USSTRATCOM, JFCC IMD executes our support to designated UCP responsibilities along five key lines of effort:

- Synchronize operational missile defense planning, security cooperation activities and global force management for missile defense capabilities.
- Conduct global ballistic missile defense operations support, asset management, alternate execution authority, and intelligence support.
- Integrate, synchronize, and conduct above element Joint Ballistic Missile Defense training, exercises, and test activities.
- Advocate and coordinate for global missile defense capabilities, conduct analysis and assessments of current and future capabilities, and recommend operational acceptance.

- Protect information systems and provide network support for missile defense operations.

To accomplish these efforts, we maintain close collaborative relationships with the GCCs, MDA, the Services, the Office of the Secretary of Defense (OSD), the Joint Staff, our allied and partner nations. We continually enhance our deployed capabilities while gaining operational experience and confidence in our collective ability to defend the Nation, deployed forces, partners, and allies. Some of our key efforts to enhance missile defense planning and capabilities for both the homeland and regional architectures follow.

Expansion and Integration of the Missile Defense Architecture: In response to the evolving strategic environment, we continue to bolster homeland and regional missile defense capabilities. Over the past year, we have operationally accepted the Aegis Ashore capability in Romania as the centerpiece of the European Phased Adaptive Approach (EPAA) Phase II, extended the GMD capability against the threat to the homeland by emplacement of another Inflight Interceptor Communications System Data Terminal at Fort Drum, New York, and are steadily increasing the GBI inventory toward 44 GBIs by 2017. In support of the Global Missile Defense mission, we are advancing the development of new capabilities for the Aegis Ashore in Romania, the Standard Missile 3 block IIA (SM-3 IIA) under co-development with Japan, the Long Range Discrimination Radar, the Redesigned Kill Vehicle (RKV) for the GBI, and various other capabilities. Given many of the challenges associated with implementation of these architectures, JFCC IMD, in support of USSTRATCOM's coordinating role for global missile defense, is collaborating with the GCCs to assess and address the cross-regional gaps in the areas of planning, policy, capabilities, and operations.

Multi-Regional BMD Asset Management: JFCC IMD, in coordination with USSTRATCOM and the GCCs, manages the availability of missile defense assets to balance operational readiness postures, scheduled and unscheduled maintenance activities, and the MDA and Services' test requirements. This important process allows us to continually assess our readiness to defend against a ballistic missile attack and to recommend adjustments to optimize the overall BMD architecture.

Global Planning and Assessment: Regional and global missile threats continue to increase in numbers and complexity. JFCC IMD continues to work with the missile defense community of interest to refine processes to synchronize trans-regional global missile defense planning and operations. Codified in periodic revisions to the Global Missile Defense Concept of Operations, these processes ensure unity of effort and mitigation of potential seams and gaps across geographical areas of responsibility. Key elements of this year's revision include updates to the Adversary Centric Plans Assessment, Global Prioritized Defended Asset List process and an establishment of an International Engagement Framework. Consistent with the Department's transition to planning based on problem sets, we refined our process for the adversary centric plans assessment and completed an additional objective analysis looking at missile defense risk to missions across multiple GCC plans associated with a given adversary. This assessment identified systemic risk, informed recommendations for shortfall mitigation, and will support GCC's increased effectiveness in future missile defense planning. The output of this analysis directly informs the Global Integrated Air and Missile Defense Assessment (GIAMDA) which serves to shape recommendations for global force management and advocacy efforts for future capability investments.

Global Force Management: USSTRATCOM, as the designated Joint Functional Manager for missile defense, relies upon JFCC IMD to evaluate and recommend sourcing of BMD requirements based on assessed risk. Due to the high demand, low-density nature of missile defense assets, all sourcing decisions have a direct and significant impact to other Combatant Commanders' campaign and contingency plans. Last year, JFCC IMD further refined our approach to prioritize steady state global missile defense requirements. This global Prioritized Defended Asset List (Global PDAL) categorizes GCC critical assets based on global risk to inform our recommendations into the Global Force Management process and enable senior leaders to make more informed decisions on the allocation of low density missile defense forces.

Allied Ballistic Missile Defense Integration: Given that we will never have enough active defense capacity, the integration of allies into our architecture continues to be a critical Warfighter priority. In support of those efforts, our Global Missile Defense

CONOPS includes an International Engagement Framework which provides a common approach to identify potential partners, a model to identify a level of maturation and an assessment mechanism. This approach provides a common lexicon to report progress of allied capability development and integration and share best practices across the missile defense community.

One such venue that promotes increased cooperation is the NIMBLE TITAN experimentation campaign, a biennial series of multi-national missile defense experiments designed to explore policy and operational concepts required for coalition missile defense. The NIMBLE TITAN campaign provides a unique forum to advance U.S. missile defense policies and combatant command regional security objectives.

"We must strengthen our collaboration with our Allies and explore further integration of our collective capabilities toward an effective mutual defense."

-- USSTRATCOM Posture Statement April 2017

The NIMBLE TITAN community of interest has increased to 24 nations and four international organizations and includes participants from Ministries of Foreign Affairs and Ministries of Defense from North America, Europe, the Middle East, and Asia-Pacific regions, along with Department of State, OSD, Joint Staff, MDA, and the Combatant Commands. As the premier strategic and policy level focused missile defense event in the world, this campaign provides participating nations with critical opportunities for multi-national and cross-regional discussions and experience in information-sharing as well as command and control procedures that enhance synchronized missile defense capabilities.

Our efforts in NIMBLE TITAN 16 culminated in the February 2016 Capstone Wargame and a subsequent senior leader forum in June 2016 that was co-hosted by the Department of State. While past NIMBLE TITAN campaigns have focused only on ballistic missile defense, NIMBLE TITAN 16 was the first campaign that expanded the focus to integrated air and missile defense, a growing area of concern for both the United States and many of our partner nations and allies. Other discussion topics included national policies and the need for increased regional and cross-regional

coordination, sensor integration, and multinational MD planning solutions. We have completed concept development for the NIMBLE TITAN 18 campaign, and will conduct several events with the 28 member nations and international organizations to explore a wide range of potential military and political solutions to global IAMD challenges. NIMBLE TITAN has been a gateway for the United States to establish relationships with crucial international partners, as well as inform the missile defense policies of nations and organizations such as NATO. Conclusions derived from this campaign will continue to inform real world policy decisions and multinational MD planning.

Additionally, we are working to integrate Allies directly into the JFCC IMD staff through the Foreign Liaison Officer (FLO) program. We recently added the first German Air Force officer and are seeking to add additional Foreign Liaison Officers to increase our understanding of allied missile defense policies, capabilities, and planning in order to better optimize the Nation's planning and force allocation.

Joint BMD Training: In coordination with USSTRATCOM, the Joint Staff, Combatant Commands, and the Services, we have developed a comprehensive and innovative training program to close gaps between Service, Joint, and regional BMD training and education. Over the past year, we completed development of the first Joint Training Center of Excellence framework and are on track to complete certification this year. In addition to our nine mission-oriented courses, we have published an online orientation course available to the Warfighter 24/7 and added an additional course to meet combatant command and Warfighter training needs. We hosted a working group to analyze the effects of Contested, Degraded, and Operationally limited (CDO) operations on the ballistic missile defense system as well facilitated more operationally relevant BMDS tactics, techniques, and procedures. In just the past year, 18 JFCC IMD instructors provided 206 courses to more than 3,300 students worldwide via the Joint BMD Training and Education Center and Mobile Training Teams. Additionally, in keeping with Joint Vision 2020, JFCC IMD provided training courses to ally and partner nations using both Military-to-Military and Foreign Military Sales Training venues.

Warfighter Capability Acceptance and Integrated Master Test Plan: As the missile defense architectures mature, Warfighters require a credible, comprehensive assessment of new capabilities to inform operational acceptance into the global BMDS.

Over the past year, we supported flight tests with the U.S. and Japan co-developed SM-3 Block IIA interceptor for Phase III of the EPAA architecture with two successful non-intercept flight tests and one successful intercept test. We have another intercept test planned for this year. Additionally, we have planned two THAAD flight tests involving engagement of intermediate- and medium- range ballistic missile targets, and three operational tests involving Patriot upgrades. For homeland defense capability, we provided Warfighter support in the January 2016 GMD Controlled Test Vehicle (CTV) 02+, demonstrating the Exo-atmospheric Kill Vehicle alternate divert thruster in support of GBI upgrade efforts and key discrimination capabilities for future sensor network improvements. This year, we will continue Warfighter support in the upcoming GBI flight test to validate interceptor improvement modifications. The Warfighter relies on a robust and operationally relevant test campaign to confidently field and integrate new capabilities into their existing Integrated Air and Missile Defense architectures.

In summary, JFCC IMD continues to expand our nation's global missile defense architecture and explore future capabilities to maintain operational advantage against current and future threats. That competitive edge is maintained through our deliberate investments in our capability developments by MDA and the Services, investments in our Warfighters through education and training, and expansion of our collaboration with allies and partners.

Conclusion

Mr. Chairman and Ranking Member Cooper, as a member of the Joint missile defense community, the Army continues to pursue enhancements to the Nation's integrated air and missile defense systems, from the strategic to the tactical levels. Our trained and ready Soldiers operating GMD elements in Colorado, Alaska, New York, California, and from remote, globally deployed locations, remain on point to defend the homeland against an intercontinental ballistic missile attack. As a force provider to the GCCs, our Soldiers provide essential regional sensor capabilities and ballistic missile early warning. Our regional forces continue to leverage allied collaboration and planning efforts in developing integrated and interoperable defenses against the various threat sets. USSTRATCOM, through the JFCC IMD, continues to integrate BMDS

capabilities to counter global ballistic missile threats and to protect our Nation, deployed forces, partners, and allies.

While operational, doctrinal, and materiel developments are essential, our most important assets are the thousands of Soldiers, Sailors, Airmen, Marines, Civilians, and Contractors who deploy and operate our integrated air and missile defense systems. Additionally, as continuously highlighted by Department leadership, the strength behind our outstanding workforce is their Families. The contributions and sacrifices of the Families serves to greatly enable the dedication and performance of our workforce—the role and support of our Families empowers mission accomplishment.

I appreciate having the opportunity to address missile defense matters and look forward to addressing your questions.

LTG James H. Dickinson
Commanding General
USASMDC/ARSTRAT

Lieutenant General James H. Dickinson assumed command of the U.S. Army Space and Missile Defense Command/Army Forces Strategic Command and Joint Functional Component Command for Integrated Missile Defense on Jan. 5, 2017. Commissioned in 1985 as a Second Lieutenant, he has held leadership positions, from platoon leader to Commanding General of an Army Air and Missile Defense Command.

He most recently served as the Chief of Staff, U.S. Strategic Command, Offutt Air Force Base, Nebraska. He was previously assigned as the Director for Test at the Missile Defense Agency, Redstone Arsenal, and as Deputy to The Inspector General in the Office of the Secretary of the Army.

LTG Dickinson was the Commanding General of the 32nd Army Air and Missile Defense Command at Fort Bliss, Texas, from July 2012 to March 2014, and Commanding General of the 94th Army Air and Missile Defense Command at Fort Shafter, Hawaii, from August 2011 to July 2012.

Additional command assignments include: Battalion Commander, 1st Battalion, 7th Air Defense Artillery, 32nd Air and Missile Defense Command, Fort Bliss, Texas, where the battalion deployed in support of Operations Enduring Freedom and Iraqi Freedom; and Brigade Commander, 35th Air Defense Artillery Brigade, Eighth United States Army, Republic of Korea.

Previous staff assignments include: Operations Officer, 5th Battalion, 52nd Air Defense Artillery, 11th Air Defense Artillery Brigade, Fort Bliss, Texas, and Operation Southern Watch, Saudi Arabia; Operations Officer, 11th Air Defense Artillery Brigade, Fort Bliss, Texas; Senior Emergency Actions Officer and Senior Operations Officer, National Military Command Center, J-3, Joint Staff, Washington, D.C.; Chief of Operations, G-3, later Assistant Chief of Staff, G-3, 32nd Army Air and Missile Defense Command, Fort Bliss, Texas; Chief, Commander's Initiatives Group, United Nations Command/Combined Forces Command, U.S. Forces Korea, Republic of Korea; and Deputy Director for Operations, National Military Command Center, J-3, Joint Staff, Washington, D.C.

His awards and decorations include the Distinguished Service Medal (oak leaf cluster), Defense Superior Service Medal (two oak leaf clusters), Legion of Merit (two oak leaf clusters), Bronze Star Medal, Defense Meritorious Service Medal, Meritorious Service Medal (two oak leaf clusters), Army Commendation Medal (two oak leaf clusters), Joint Service Achievement Medal, Army Achievement Medal (three oak leaf clusters), Parachutist Badge, Basic Space Badge, and Joint and Army Staff Identification Badges.

LTG Dickinson graduated from Colorado State University with a Bachelor of Science in mechanical engineering and from the Colorado School of Mines with a Master of Science in operations research and systems analysis (engineering). He later earned a master's degree in strategic studies from the United States Army War College.

January 2017

RECORD VERSION

STATEMENT BY
MR. BARRY J. PIKE
U.S. ARMY PROGRAM EXECUTIVE OFFICER,
MISSILES AND SPACE

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

FIRST SESSION, 115TH CONGRESS

ON FISCAL YEAR 2018 PRIORITES AND POSTURE OF MISSILE DEFEAT
PROGRAMS AND ACTIVITIES

JUNE 7, 2017

NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES

Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Subcommittee, I am honored to appear before you to testify on Missile Defense and to thank you for your continued support of the more than 1,850 men and women who comprise Program Executive Office (PEO) Missiles and Space (MS).

Support to the Warfighters and their readiness remains our number one priority. It is driven by three core principles: 1) Develop, deliver, and sustain best value products and services to the Army, Joint, and International Partners; 2) Align and leverage investments in capabilities and technology developments; and 3) Continue to improve the efficiency, effectiveness, and agility of the acquisition process.

As the Program Executive Officer, it is my responsibility to lead the materiel development, production, fielding, and sustainment of assigned missile and space systems for U.S. Army, Joint, and Coalition Warfighters. This includes the centralized management of Army Air and Missile Defense (AMD), Long Range Fires, Close Combat, and Aviation missile systems, as well as designated space programs. We are responsible for the full life-cycle management of assigned systems, and we provide worldwide support of fielded weapon systems.

In today's complex, dynamic, and volatile security environment, AMD is a key strategic enabler. As such, our focus continues to be on providing warfighting solutions to the Army, Combatant Commands (CCMDs), and International Partners across the operational spectrum. We accomplish this by working closely with other Military Departments, the Missile Defense Agency (MDA), and Space and Missile Defense Command (SMDC) to provide Joint Integrated AMD capabilities.

To meet the Army's AMD materiel development needs, I lead a diverse, talented, and dedicated workforce that is committed to meeting the demands of our Warfighters and our taxpayers. Our ability to continue to meet the Army's AMD requirements and the needs of the Warfighter is only possible with the continued support of Congress.

As the operational environment evolves, PEO MS continues to provide the Army with multiple options, integrated with multiple partners, to operate across multiple domains in order to present multiple dilemmas to our nation's adversaries.

Specific AMD programs include: the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS); PATRIOT including the ground system, legacy missiles, PATRIOT Advanced Capability-3 (PAC-3), and PAC-3 Missile Segment Enhancement (MSE) missiles; the Lower Tier Air and Missile Defense Sensor (LTAMDS); the Indirect Fire Protection Capability (IFPC) System; Sentinel radars; Stinger and Avenger Short Range Air Defense (SHORAD) Systems; the Counter-Rocket, Artillery, and Mortar (C-RAM) Systems; Counter-Unmanned Aerial System (C-UAS) Capabilities; and the Joint Tactical Ground Station (JTAGS). Additionally, PEO MS continues to assess engineering level Electronic Warfare (EW) and Cybersecurity demonstrations to improve the Electronic Protection and Cybersecurity Posture of our weapon systems. By the end of 2017, we will:

- Conduct a series of IBCS Developmental Tests including Soldier Check-Out Events to demonstrate correction of deficiencies identified in the 2016 Limited User Test (LUT) on the path to another LUT prior to a Low Rate Initial Production Decision
- Deliver 155 PAC-3 MSE missiles, in addition to the over 1,400 PAC-3 Cost Reduction Initiative missiles already fielded
- Recapitalize one complete PATRIOT Battalion set of equipment
- Complete Initial Operational Test and Evaluation (IOT&E) of PATRIOT Software Version 8.0
- Modernize the PATRIOT capability in South Korea (35th Air Defense Artillery (ADA) Brigade) with the latest Software Version 8.0 and the new Radar Digital Processor, Modern Manstation, and Modern Adjunct Processor
- Produce and field the five Dismounted PATRIOT Information Coordination Central (D-PICC) systems
- Complete the IFPC Increment 2, Block 1 Critical Design Review and Technology Maturation and Risk Reduction (TMRR) phase

- Continue to field and support Fixed-Site, Expeditionary, and Mobile C-UAS capabilities in the U.S. Central Command (USCENTCOM) Area of Responsibility

- Release the Sentinel A4 radar Request for Proposals projected for 8 January 2018

- Conduct a demonstration of Maneuver SHORAD (M-SHORAD) Capability

- Field the latest upgrade to the JTAGS in Japan

- Continue to improve our resilience and ability to mitigate Cyber and EW attacks.

The IBCS remains the Army's number one air and missile developmental priority and serves as the foundation for Army AMD modernization. The program will field Engagement Operation Centers and an Integrated Fire Control Network to integrate Army AMD sensors and shooters through a common battle command system. When fielded, IBCS will enable a tailorable, flexible, task-organized Army AMD force, breaking the current stove-piped system construct. The IBCS will facilitate affordable, competitive modernization at the AMD component level through standardized government-controlled interfaces to the Integrated Fire Control Network. The IBCS will be fielded to all echelons of Army AMD battlefield forces to defend against close to medium range ballistic missiles; cruise missiles; manned and unmanned aircraft; air to ground missiles; and Rockets, Artillery, and Mortars (RAM).

In 2016, we completed the IBCS LUT that began in March and concluded in May. The LUT included three phases of tests: a flight test phase; a sustained operations phase; and a Hardware-in-the-Loop phase. The overall results were unsatisfactory due to software immaturity issues and instability, although Soldiers were able to destroy a ballistic missile target and a cruise missile target in a near-simultaneous engagement using IBCS and the Integrated Fire Control Network. Since the LUT, we have taken delivery of two new builds of IBCS software that have shown a marked improvement over what was tested. The latest software version will be tested at a Soldier-operated developmental test event later this year to demonstrate software deficiency corrections and capabilities not assessed at the LUT.

Ground test efforts to demonstrate IBCS interoperability with the Ballistic Missile Defense System via IBCS and MDA's Command, Control, Battle Management and Communications (C2BMC) system continue to be successful. We successfully demonstrated the ability of IBCS to serve as the fire control system for the IFPC system.

The Army's PATRIOT force continues to be the cornerstone of AMD protection for our deployed forces, friends, allies, and partner nations. PATRIOT is in high demand with almost half of the force deployed, forward-stationed, or on prepare-to-deploy orders. To maintain a high state of readiness, a number of significant PATRIOT capability enhancements have been accomplished this last year. We completed the planned fielding of Post Deployment Build-7 (PDB-7) software and the Modern Adjunct Processor to all 15 PATRIOT battalions. Last October, we achieved the PAC-3 MSE First Unit Equipped two months ahead of schedule. We achieved PAC-3 MSE Initial Operational Capability (IOC) in July 2016.

In Fiscal Year 2016 (FY16), part of developmental testing for the next configuration upgrade, the PATRIOT system successfully engaged ballistic missile and air breathing threats, demonstrating for the first time an intercept of a ballistic missile with a hit-to-kill PAC-3 MSE interceptor and a PATRIOT Guided Enhanced Missile, tactical ballistic missile (GEM-T) in a ripple method fire. IOT&E began in September 2016 and is scheduled to conclude in September 2017. The IOT&E consists of five phases including: sustained operations, air battle, joint interoperability, flight tests, and regression training. Successful testing and fielding of the upgraded PATRIOT configuration will support the PAC-3 MSE Full Rate Production decision scheduled for late in the second quarter of FY18.

In 2015, the Office of the Secretary of Defense directed the Army to conduct a study to explore the extreme stress on the PATRIOT force and find methods to relieve the stress. As a result of the study, three initiatives were approved: develop, procure, and field five D-PICC systems; modernize the 35th Air Defense Artillery (ADA) Brigade (BDE) in South Korea; and stand-up an AMD Test Detachment.

The D-PICC contains much of the existing capability found in the PATRIOT Information Coordination Central, which is an integral part of the PATRIOT command and control capability at the battalion level. Specifically, capabilities such as external communications, joint interoperability, and joint air picture through Link-16 are extended through the use of D-PICC, which results in increased operational flexibility to cover multiple geographically separated assets simultaneously. Further, D-PICC allows for split deployments of an operational PATRIOT battalion to meet multiple mission requirements by augmenting the battalion with 10 additional personnel and reducing the amount of equipment required to support Combatant Commanders' (CCDRs) requirements. We plan to deliver the five D-PICC systems by the end of December 2017.

The modernization of the 35th ADA BDE is another stress-reduction initiative that simultaneously improves the capabilities of the PATRIOT fleet in U.S. Pacific Command (PACOM) while minimizing the stress on the PATRIOT operational force. The 35th ADA BDE, forward stationed in South Korea, operates in one of the most volatile areas of the world and is exposed to North Korea's frequent testing of advancements in missile technology. In order to provide the upgraded PATRIOT capability and reduce the deployment stress on the force, an Army Team, comprised of government and industry representatives, deployed to the region with all the equipment necessary to modernize the BDE, precluding the need to deploy a U.S.-based PATRIOT battalion. Previous overseas modernization efforts required the deployment of an additional battalion to provide "overwatch" while the designated unit underwent modernization. The modernization effort is projected to be completed by the end of December 2017.

The last initiative is the establishment of a dedicated Test Detachment in the first quarter of FY18 that will support AMD modernization, which will return a PATRIOT Battalion to the operational force pool.

The Army initiated a modernization strategy several years ago that will completely replace PATRIOT's command and control hardware with IBCS and enable future competitive developments of net-centric radar, launcher, and

interceptor components. The strategy is critical to our Nation's ability to provide our Combatant Commanders with flexibility, innovation, and capability in the face of evolving threats. We continue to execute two critical lines of effort for PATRIOT: near-term modification of existing components and long-term competitive system modernization.

Near-term PATRIOT ground system modifications are needed prior to the Department of Defense's LTAMDS decision because current threats have created critical performance gaps in today's PATRIOT system. These performance gaps are exploitable since a new LTAMDS is not expected to begin fielding in the near term. Until a new sensor is fielded in sufficient quantities, the Army must continue to incrementally modernize the existing PATRIOT capability to keep pace with the threat. Stable and sufficient funding is critical in order to enable the Army to modify existing systems in the near-term while new/improved IBCS-enabled components are developed.

Integration of Terminal High Altitude Area Defense (THAAD) and PATRIOT capabilities (such as Tactical Ballistic Missile engagement coordination) began in the 1990s. The concept of integration was initially implemented and fielded in PATRIOT Post Deployment Build – 5 software in 1999. Since then, PATRIOT and THAAD have participated in joint flight testing and we continue to look for opportunities to combine flight tests in the future. Currently, the Army and MDA are planning for PATRIOT to participate in MDA's Operational Flight Test-03 in 2018. Additionally, the Army and MDA are planning a PATRIOT and THAAD tracking exercise, FTX-36, in 2018. Fielding of PATRIOT Post Deployment Build 8.0 Software provides PATRIOT/THAAD automated engagement capability, upper tier debris mitigation, and interoperability with the Ballistic Missile Defense Link 16 requirement. Future efforts will continue to expand the PATRIOT/THAAD defended area. The IBCS and PATRIOT systems continue to participate in the MDA-sponsored ground test program to demonstrate interoperability among ballistic missile defense components.

PATRIOT's strong relationship with 12 international partners continues. Many of these partners are upgrading, modernizing, and/or procuring additional ground

equipment and interceptors. Additionally, Romania and Poland recently submitted requests to procure Army AMD capabilities including PATRIOT and/or IBCS. The cost estimates and documentation for Congressional Notification are being prepared.

The IFPC program is developing a mobile, ground-based weapon system designed to provide 360-degree protection against Cruise Missiles; Unmanned Aircraft Systems (UAS); and RAM threats for fixed and semi- fixed sites. An engineering demonstration of the IFPC system was successfully completed in March 2016 including the effective demonstration of four different interceptors launched from the Multi-Mission Launcher using the IBCS for integrated fire control. The IFPC Increment 2-Block 1 program will provide the first of three planned block capabilities (Counter-UAS and Cruise Missile Defense (CMD)). Current plans are to complete the System Critical Design Review and the TMRR phase of the program this summer. Additionally, as part of Block 1 program, a second missile will be added to provide a lower-cost CMD and C-UAS capability, as well as an initial Counter-RAM capability.

The Sentinel radar is employed in an air defense role against cruise missile, UAS, and fixed/rotary wing aircraft threats as well as an air surveillance role to prevent fratricide while in support of the C-RAM capability. It is a highly mobile radar system that provides 360 degree coverage at shorter ranges and lower altitudes than the PATRIOT radar. We are planning continued development and modification of the Sentinel radars to address capability gaps and obsolescence issues in target detection, tracking, net-readiness, electronic countermeasures, Identification Friend or Foe, and counter-UAS/counter-RAM capabilities. Fielding of the Sentinel A3 Common Platform Upgrade is on-going and will be completed in FY19.

We have initiated efforts to develop an Active Electronically Scanned Array (AESA) modification to the Sentinel radar called the Sentinel A4. The Sentinel A4 will provide increased capability including extended range for ground-based surveillance and situational awareness, faster and more accurate Non-Cooperative Target Recognition, improved Fire Control quality track accuracy, and management of larger track loads. Sentinel A4 will detect and track small and slow targets at low altitude in

clutter. Sentinel A4 will support IBCS requirements and IFPC Increment 2, Block 2 requirements.

The Avenger Weapon System Modification - Service Life Extension Program (MOD-SLEP) addresses obsolescence and Information Assurance requirements by replacing key Line Replaceable Units (LRUs). The Avenger can autonomously detect airborne targets and has a slew-to-cue capability that improves performance by allowing cues from a radar system in reduced visibility, weather, and other environments. The Avenger maintains its complement of Stinger missiles which are capable against rotary wing, fixed wing, cruise missiles and some UASs. The Avenger MOD-SLEP is currently finalizing development of these key LRUs and is moving into system level testing. Fielding of these upgraded LRUs is planned in 2020. The MOD-SLEP will ensure Avenger retains operational capability until FY31. We are also conducting a Stinger SLEP, which will utilize expiring missiles from existing inventory and replace missile components susceptible to degradation due to aging. Production of the first lot of SLEP missiles began in February 2017. The addition of a target detection device to the current Stinger missile will provide improved effectiveness against low, slow, small UAS threats. This Stinger enhancement provides a rapid and low cost capability for C-UAS intercept while retaining existing capability against traditional air threats.

At present, the Army has a limited capability to protect armored and infantry maneuver formations from low altitude air attacks. There are multiple ongoing efforts that will inform Army leadership of an interim Maneuver-SHORAD (M-SHORAD) capability to address the gap until a program of record is initiated. We are working with industry to develop an interim capability and will conduct a demonstration of proposed concepts later this year. Results from this demonstration will inform the decision to conduct the integration and testing of an interim M-SHORAD solution for consideration to begin fielding in 2019.

The C-RAM system continues to save lives in multiple combat operations, providing warning and protection for U.S. and coalition personnel including critical assets. C-RAM's primary mission is to detect RAM launches with minimal false

detections, provide localized warning to only the affected area, intercept rounds in flight, and enhance response to defeat enemy forces. The capability is comprised of a combination of multi-service fielded and non-developmental sensors, command and control equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System [LPWS]). The C-RAM System has provided more than 6,600 successful Warns and more than 300 intercepts with no fratricides or injuries to friendly forces or civilians.

In June 2016, we were assigned as the Office of Primary Responsibility (OPR) to provide C-UAS capability to CENTCOM, with the mission of deploying tactically relevant systems to thwart the threat to U.S. forces posed by the proliferation of small UAS across the battlefield. We are employing a phased approach to meet this requirement, with initial efforts focused on fielding to fixed and semi-fixed sites with transition to mobile and dismounted solutions. We began fielding fixed and semi-fixed site C-UAS capabilities in October 2016. Since then, we have fielded several Expeditionary Low-Slow-Small-UAS Integrated Defeat Systems (E-LIDS) systems. Follow-on deployments will include additional E-LIDS and new Mobile-LIDS (M-LIDS) by the end of this fiscal year.

The JTAGS System provides ballistic missile launch warning and cueing information for the AMD architecture and Theater Combatant Commanders. Five JTAGS Systems are fielded: one in CENTCOM, one in U.S. European Command (EUCOM), two in U.S Pacific Command (PACOM), and a training system in the United States. We will begin fielding the modernized JTAGS capability in 2017. The Phase 1 capability provides refreshed technology and a more effective environment for the Soldier operators. Enhanced warning and cueing capability is provided through incorporation of data from the Space Based Infrared System (SBIRS) scanning sensors. Development and testing of the Phase 2 capability is on-going to incorporate data from the SBIRS staring sensors.

Mr. Chairman, Ranking Member Cooper, and Members of this Subcommittee, thank you for the opportunity to provide insight into the AMD portion of the PEO MS portfolio. I look forward to addressing your questions.

Mr. Barry J. Pike
Program Executive Officer, Missiles and Space

Mr. Pike is the Program Executive Officer, Missiles and Space, Redstone Arsenal, Al. He is responsible for the development, production, fielding, sustainment, and international program aspects for assigned missile and space systems. In January 2016, Mr. Pike was promoted to Senior Executive Service, Tier II.

Prior to his current assignment, Mr. Pike was the Deputy Program Executive Officer, Missiles and Space, which he assumed in 2010. Mr. Pike was selected for the Senior Executive Service in January 2010.

Mr. Pike served as the PEO MS Chief of Staff from 2005-2010. From 1992-1999, he served in a variety of key leadership positions in the Army National Missile Defense Ground Based Elements Program Office including the Deputy Program Manager, Chief of the Program and Acquisition Management Division, Assistant Program Manager for Program Planning, and Chief of the System Engineering and Analysis Branch. In the DPM position, he shared responsibility with the SES Program Manager in directing the development, testing, integration, and deployment planning of the ground-based NMD elements including the ground-based interceptor, ground-based radar, and associated battle management/command, control, and communications capability.

In 1991, Mr. Pike was selected for a prestigious one-year developmental assignment in the Office of the Under Secretary of Defense for Acquisition at the Pentagon. He led the THAAD Milestone I Defense Acquisition Board (DAB) coordination efforts across the Services, Joint Staff, and OSD Staff.

From 1988-1991, Mr. Pike led the Army's Anti-Satellite (ASAT) Initiative and was assigned as the Army focal point for ASAT management. He led the program through the Milestone 0 and Milestone I DAB Reviews resulting in the initiation of the Kinetic Energy (KE) ASAT program and the establishment of the KE ASAT Joint Program Office. In the KE ASAT JPO, Mr. Pike led various systems engineering teams.

Mr. Pike has received numerous government and defense industry awards including two Meritorious Civilian Service Awards, two Superior Civilian Service Awards, two Commander's Awards for Civilian Service, the OSD Award for Excellence, the National Defense Industrial Association Materiel Acquisition Award, and the Ancient Order of Saint Barbara's for Air Defense Artillery. He has also been nominated three times for the Redstone/Huntsville AUSA Civilian of the Year Award. He is Level III certified in Program Management and Systems Planning, Research, Development, and Engineering career fields.

Mr. Pike is a native of Hartselle, Al. He graduated with honors from Auburn University with Bachelor's and Master's Degrees in Chemical Engineering. While at Auburn, he was elected to the Student Government Association Senate and was a member of numerous professional engineering organizations and honor societies including Tau Beta Pi. He is a graduate of the Defense Acquisition University Program Management Course and is a member of the Army Acquisition Corps.

Current as of January 2016

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