DEPARTMENT OF DEFENSE AUTHORIZATION OF APPROPRIATIONS FOR FISCAL YEAR 2015 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, APRIL 2, 2014

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

BALLISTIC MISSILE DEFENSE POLICIES AND PROGRAMS

The subcommittee met, pursuant to notice, at 2:33 p.m. in room SR–222, Russell Senate Office Building, Senator Mark Udall (chairman of the subcommittee) presiding.

Committee member present: Senators Udall, King, and Sessions.

Majority staff member present: Richard W. Fieldhouse, professional staff member.

Minority staff member present: Robert M. Soofer, professional staff member.

Staff assistant present: Lauren M. Gillis.

Committee members' assistants present: Christopher R. Howard, assistant to Senator Udall; Rachel H. Lipsey, assistant to Senator Donnelly; Stephen M. Smith, assistant to Senator King; and Lenwood A. Landrum, assistant to Senator Sessions.

OPENING STATEMENT OF SENATOR MARK UDALL, CHAIRMAN

Senator UDALL. The subcommittee will come to order. The Strategic Forces Subcommittee meets today to consider the ballistic missile defense programs and policies supporting the President's budget request. We have five expert witnesses joining us today to help us review these important and complex issues.

Ms. Elaine Bunn is the Deputy Assistant Secretary of Defense for Nuclear and Missile Defense Policy. She's testified before the subcommittee on nuclear policy, and she's here today as the Defense Department's expert on missile defense policy issues.

The Honorable Michael Gilmore is the Director of Operational Test and Evaluation within the Department of Defense. He provides the DOD and Congress with independent assessments of the adequacy and results of our missile defense testing and also plays a critical role in reviewing and approving the semi-annual integrated master test plan for missile defense.

Vice Admiral Jim Syring is the Director of the Missile Defense Agency, which researches, designs, develops, tests, and fields our ballistic missile defense system and supports its operation and improvement. He is responsible for roughly $7.5 billion in this year's budget request.

Lieutenant General David Mann is the Commander of the U.S. Army Space and Missile Defense Command. He is also the Joint Functional Component Commander for Integrated Missile Defense under U.S. Strategic Command. He represents the crucial warfighter perspective on missile defense issues, which we always want to keep in mind since they are the customer and the user.

Ms. Cristina Chaplain is the Director of Acquisition and Sourcing Management at the Government Accountability Office and leads the GAO evaluation of our missile defense acquisition programs. Congress has benefited from her work on this topic, among many others.

We welcome you all back to the subcommittee and we thank each of you for your long and dedicated service to the Nation and to our security.

Ballistic missile defense has taken on a growing importance as missile threats have grown. We all want operationally effective, cost effective, and affordable missile defenses to protect our homeland, our forward deployed troops, our allies, and our partners. We also recognize such missile defense is both technically challenging and expensive.

Unfortunately, by imposing sequestration on the budget of the Defense Department and the rest of government Congress has made the effort more difficult. Those constraints mandated by Congress affect our missile defense programs just like all other government programs. If we let sequestration return with full force next year, it will make things worse. I would continue to urge my colleagues on both sides to work to avoid that.

With respect to our homeland missile defense capability, we have a system in place today that protects the entire Nation from limited missile attacks from North Korea and a potential Iranian threat. Yet we all know that we have had problems with the kill vehicles on that system and we need to fix those problems and demonstrate the fixes through realistic testing before we buy more interceptors. That's what we call fly before you buy.

Those kill vehicle problems occurred because we deployed the system before it was properly designed, engineered, and tested. In other words, in its haste to deploy the system quickly the Bush Administration did not practice fly before you buy. Consequently, I am pleased that the budget request includes funds to redesign the kill vehicles so that they will be more effective, robust, and reliable. This committee has supported such a redesign. In order to avoid repeating any of the previous mistakes, we also need a rigorous acquisition approach with stringent engineering design and testing to be confident it will work before we deploy it.

As the Pentagon has told us, we also need to improve our homeland defense capabilities by investing in additional sensor and discrimination capabilities. That is their highest and best priority because it will make our current system more effective and allow us

to defeat more threat missiles with our existing and planned interceptors.

Regional missile defenses are a high priority for our regional combatant commanders because they need a capability to address existing missile threats to Europe, the Middle East, and Asia, especially those from Iran and North Korea. That's why the Joint Chiefs of Staff and Secretary of Defense Robert Gates unanimously recommended the European Phased Adaptive Approach, or EPAA, to the President. It would rapidly provide the capability they needed to protect NATO Europe against the growing Iranian missile threat.

Phase 1 of the EPAA was deployed in 2011 and we are on track to deploy phase 2 in Romania next year. Phase 3 is planned for deployment in Poland in 2018 at the same site we agreed with Poland back in 2008. We will be interested to hear more about the progress of EPAA and on our regional defense efforts, particularly with our allies and partners in the Middle East and Asia.

So with all of that said, we look forward to your testimony on these important topics. Before we turn to you for brief oral statements, let me turn to my friend and ranking member, Senator Sessions, for any comments that he wishes to make. Senator Sessions.

Senator SESSIONS. Thank you, Mr. Chairman. I think you make some very important observations that I share in your remarks. Thank you for that.

In March of last year, Secretary Hagel announced steps to strengthen homeland missile defense, including the deployment of 14 more GBIs in Alaska, which was really bringing it back up to the Bush plan after they had been reduced, and deploying a second AN/TPY2 radar in Japan to provide improved early warning, particularly from North Korean launches. This was a recognition, I think, that we face a long-range missile threat to the homeland and that threat is increasing faster than we expected.

This year the budget request includes several important initiatives meant to improve the GMD system. They include: a redesigned exoatmospheric kill vehicle for the ground-based interceptor, which you made reference to; and a new long-range discrimination radar to be deployed in Alaska; and software improvements for threat discrimination. So those are good steps. I believe they'll save money in the long run. If we can get our discrimination ability and our ability to discriminate against false threats, we can use fewer launches and have more effect. So I commend Admiral Syring and Secretary Hagel for these steps.

Back in 2009, the Department of Defense decided to cease deployment of GBIs at 30 at Fort Greely and that has now been overcome. I recall a meeting in Senator Lieberman's office with Secretary Gates and other Senators where we discussed our concern about the decision to go to 30 from 44. While Secretary Gates assured us that the intention was to improve the GMD system at the time, funding shortfalls and the administration's emphasis on regional missile defense meant there was very little real improvement available to GMD.

So today I think we move forward. So the next 5 years, MDA intends to spend around $700 million to design a new kill vehicle and I believe this is overdue.

Speaking of funding, let me show this chart. It looks awfully crowded, but it sort of tells us how in Washington things start eroding when we don't really understand what's happening to us. The President made a commitment at the time of the New START treaty that we would be involved in this, but this is how it looks.

According to our staff estimates, the President's proposed 5-year spending plan that he's submitting today for missile defense is about $6 billion less than the President's fiscal year 2012 spending plan. This is what he submitted as his spending at 8.8 in 2015 and 2016, billion dollars. So here we are for 2015 and we're at 7.8, and dropping down to 7.3 in fiscal year 2019.

So based on that, we're talking about over the FYDP about $6 billion less than we were expecting to spend. Now, if this is because you've saved money on the Energy buildings at their laboratories, maybe we could survive that. Maybe it wouldn't be so devastating, because I have doubts about whether all that money, $5 billion, $10 billion buildings, was necessary. But we do not want—all I'm saying, Mr. Chairman, is having a credible missile defense system is so fundamentally important, and it's less than 5 percent of our total defense budget for the whole system, and we ought to be able to—actually, that's about 2 percent. $7 billion out of $500 billion is a lot less than that.

So I guess I would say that just points out where we are. That's what we're wrestling with, the kind of issue we're dealing with today. We want a good strong missile defense system. Can we complete it with those numbers and do you have a plan that will work? It would be great if you can do it at those numbers, but I'm a bit uneasy about it.

Thank you, Mr. Chairman—I would say one more thing. The sequester does not require us to cut any more in the future. The big cuts were this year and somewhat next year. But that Ryan-Murray bill filled in the hole this year and filled in some next year, leaving us at basically, the 050 account, at 521 this year, 521 in 2015, 561 in 2016—no, 523 in 2016, 536 in 2017, 549 in 2018, 562 in 2019, 576 in '20, and 590 in 2021.

We're going to have some pretty good increases, about a 2.5 percent increase, after the next 2 years, after the cuts we've already taken. You had to make big cuts this year, even with the little extra money that Ryan-Murray put into the account. But it avoided, I think, disastrous pain and some very unwise decisions you would have had to make. So I'm sympathetic with the problem, but we're going to all have to tighten our belt and defend America without wasting money, because the interest on the debt is going from $233 billion this year to $880 billion 10 years from today, according to CBO, and that passes the whole defense budget in 4 or 5 years.

Thank you.

Senator UDALL. Thank you, Senator Sessions.

We will hear from the panel from our left to your right. We'll start with Ms. Bunn, and if you'll keep your oral statements brief, and I know you came prepared to do so, then we can open the committee up to questions from you. So, Ms. Bunn, you're recognized.

STATEMENT OF M. ELAINE BUNN, DEPUTY ASSISTANT SECRETARY OF DEFENSE, NUCLEAR AND MISSILE DEFENSE POLICY, DEPARTMENT OF DEFENSE

Ms. BUNN. Thank you, Chairman Udall, Ranking Member Sessions, Senator Donnelly. Thank you for the opportunity to testify today, and thank you for the work you do to provide for the common defense.

That defense with regard to ballistic missiles includes the defense of our Nation, deployed forces, allies, and partners from the threat posed by ballistic missiles of many ranges—short, medium, intermediate, long-range missiles. So we need a variety of defenses for two missions: first, defending the United States against limited long-range ballistic missile attacks from countries such as North Korea and Iran, as you've said; second, defending against regional missile threats to U.S. forces, while protecting allies and partners and enabling them to defend themselves.

For both homeland and regional missile defense, our strategy has to take into account uncertainties, including both the uncertainty of future threat capabilities and the technical and fiscal uncertainties inherent in our own program development. The steps we've taken to strengthen our missile defense posture are focused on developing and deploying proven, cost-effective capabilities to address both existing and emerging threats.

With regard to homeland defense, we know that North Korea has taken actions that are provocative and concerning. They've conducted three nuclear tests. They continue their efforts to bring the KN08 road-mobile ICBM to operational capacity. While Iran has not yet deployed an ICBM, its continued efforts on space launch vehicles, along with its desire to deter U.S. and our allies, provide Iran with both the means and the motivation to develop longer range missiles, including an ICBM.

The U.S. Homeland is currently protected against potential ICBM attacks from states like North Korea and Iran. But to ensure that we stay ahead of the threat, we're taking several steps to strengthen our homeland defense posture. Deploying 14 more interceptors in Alaska will provide additional protection against both North Korea and Iranian ICBM threats as they emerge. We are also deploying, as you mentioned, a second missile defense radar to Japan, and are requesting funding to develop a radar that when it's deployed in Alaska will provide persistent sensor coverage and improved discrimination against capabilities from North Korea.

Finally, as you mentioned, we're initiating a redesign of the kill vehicle for the GBI. That will not only improve the reliability and performance of the interceptor, make our missile defenses better; it should also be easier to build, upgrade, and maintain than previous versions.

While the ICBM threat from the Middle East has not yet emerged, the regional ballistic missile threat from Iran as well as Syria exists today. Iran already has the largest inventory of ballistic missiles in the Middle East and is capable of striking targets throughout the region and into the eastern part of Europe. The Assad regime in Syria has several hundred short-range ballistic missiles that can reach much of Israel and large portions of other countries, including Turkey.

North Korea also possesses regional ballistic missiles and has recently conducted a number of short-range missile launches.

Our response—our responses are tailored to the circumstances of each region, that is Europe, the Middle East, Asia Pacific. We're continuing to implement regional missile defenses that are both phased—that is, as technology becomes available we phase them—and adaptive to the emerging threats. Our focus is on developing and fielding capabilities that are mobile, scaleable, relocatable. We're also encouraging our allies and partners to acquire missile defenses and to strengthen operational missile defense cooperation. So it's both the stuff and the operations.

We have made progress in strengthening our regional missile defense posture in the past 2 years. We've upgraded five additional Aegis ships with missile defense capability and increased our inventory of both the THAAD and Standard missile interceptors. In Europe, we already maintain a missile defense ship presence in the eastern Mediterranean, along with the radar deployed in Turkey, and plans to deploy Aegis Ashore sites in Romania in 2015 and in Poland in 2018 are on schedule. In the Asia Pacific region, we maintain an Aegis ship presence along with Patriot batteries deployed in Japan and South Korea. Last year we also deployed a THAAD battery to Guam in response to North Korean provocation. And of course we also maintain a missile defense presence in the Middle East and a strong missile defense partnership with Israel, and are working with Gulf Cooperation countries as they expand their air and missile defense as well.

We have made progress over the last several years, but we cannot afford to stand still. The President's budget reflects our goal of retaining the flexibility to adjust and enhance our defenses as the threat and technologies evolve.

Thank you for having me here today and I look forward to your questions.

[The prepared statement of Ms. Bunn follows:]

Senator UDALL. Thank you, Secretary Bunn.

Dr. Gilmore.

STATEMENT OF HON. J. MICHAEL GILMORE, DIRECTOR, OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE

Mr. GILMORE. Mr. Chairman, Senator Sessions, Senator Donnelly: I'll just briefly discuss what I see as the highlights of the test program over the last year. We learned a lot during the last year. We conducted the first ever operational test of elements of the ballistic missile defense system, working together to demonstrate a layered defense such as might be necessary in the Central Command area of operations or elsewhere in the world.

In that test, Aegis performed an intercept of a medium-range ballistic missile. THAAD was available to perform an intercept of Aegis failed, and in fact THAAD did fire an interceptor at the Aegis target, which then ended up intercepting a piece of the debris after Aegis successfully intercepted its target. Then THAAD had to plan its intercept in the presence of the debris from the Aegis intercept, and that's an important thing to demonstrate because in the kinds of large raids that many of the scenarios that we are worried about

might occur there would be multiple intercepts and the systems would have to plan intercepts in the presence of debris and other junk that was created by previous intercepts. So that was a very important test.

The integration demonstrated in that test between Aegis and THAAD was limited. The organic systems, the organic Aegis and THAAD radars, and the organic Aegis and THAAD battle management systems were used to plan those intercepts. They did share information through the command and control system that BMDS is working on. But true integrated battle management won't be possible until further upgrades for the command and control system, the BMDS command and control system, come on line later in this decade.

Nonetheless, it was a significant test. Many important things were learned. There were actually some surprises in the test. The intercepts were successful, but there were some surprises, and those surprises are being used to plan upgrades and changes in tactics, techniques, and procedures that our deployed forces can use as they today use these systems in CENTCOM and elsewhere.

So in my view it was a very valuable test, and as far as I can tell the combatant commands feel the same way. They strongly supported the test and felt that they learned a lot from it.

One thing that was demonstrated by the test—originally there were four targets that were going to be used in the test. We ended up only using two because we ran out of time because of problems associated with readying the two targets that actually were used for use. That's a problem that Vice Admiral Syring is working with and that his predecessor was working on and that continues to be a problem of note, with no easy solutions in sight, although I know Vice Admiral Syring and MDA are working very hard to make the targets more reliable, and it will be important to achieve that.

There was the failed intercept test of the Capability Enhancement 1 kill vehicle on a ground-based interceptor. We've learned a lot from that, and that's been alluded to. The Failure Review Board found several issues of concern associated with the design of the kill vehicle. I had recommended that MDA consider redesigning the kill vehicle and Vice Admiral Syring and the Department's leadership independently decided that that would be a good idea and funding, as you've noted, is provided for that. I think that's a good idea, and it's particularly important to use a rigorous systems engineering process in that redesign so that we don't end up with just patchwork fixes, but rather a more comprehensive fix to these problems that we've seen that will result in a robust kill vehicle as we go forward.

Finally, there were at least two important tests of the SM–3 1B interceptor, which provides additional capability, additional processing, and an improved seeker that will help discriminate lethal objects from things that we don't care about. When conducting ballistic missile tests, the so-called tests FTM–21 and 22, which my office is going to report on later this year, to support a full-rate production decision, those intercepts were successful and in fact the intercept of the second target was meant to and did in fact exercise the capabilities of the new seeker and the new processor in the SM–3 1B. That was successful.

Of course, that was a salvo shot. We were interested in seeing how the missiles would behave when there was one ahead of another and how the interceptors worked and the kill vehicles would work when one was looking at what the first one was doing and having to contend with the flash and other effects that are created by successful intercept as it trails the first interceptor.

Unfortunately, the second interceptor failed in flight, problems associated with the third-stage rocket motor, which is common to both the SM–3 1B and 1A, and MDA; and Vice Admiral Syring are conducted a Failure Review Board to understand that failure thoroughly. It could be connected to previous failures and MDA is going to look at a way ahead there.

So those are the highlights of the test program. I would also make one final note. My testimony, as it has for the past 4 or 5 years when I've testified, says that we're still several years away from validating the models associated with missile defense that we're going to need in order to do a thorough assessment of operational effectiveness and suitability for this system, because we're never going to be able to test in live tests over the full range of conditions under which it might be employed. So the models are very important.

Every year I've said, and I've said it again this year, that we're still several years away. Unfortunately, that is correct. One of the reasons, one of the primary reasons it's correct, is because of the 4½ year delay that we've had to suffer in gathering information on the performance of the ground-based missile defense system as a result of the three test failures that have occurred, and the last successful intercept using a GBI occurred in December 2008.

We have made progress on THAAD and Aegis, collecting information there and validating models. There's still more work to be done. But we're definitely lagging when it comes to the ground-based missile defense system because of the test failures and the need to recoup from those failures.

Thank you.

[The prepared statement of Mr. Gilmore follows:]

Senator UDALL. Thank you, Dr. Gilmore.

Admiral Syring.

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

Admiral SYRING. Thank you, Mr. Chairman, Senator Sessions——

Senator UDALL. I think you should turn on your mike.

Admiral SYRING. Good afternoon, Chairman Udall, Senator Sessions, Senator King, Senator Donnelly. Out of our total request of $7.46 billion for the fiscal year 2015 missile defense program, we are requesting approximately $1.3 billion, including the Air Force early warning radar investments, for homeland defense as we prepare to expand our GBI inventory to 44 by 2017.

My highest priority remains the successful intercept flight test of the CE–2 exoatmospheric kill vehicle. In January 2013 we conducted a highly successful non-intercept test of the CE–2 EKV. Its performance exceeded our expectations and confirmed we're on the right track to return GMD to intercept flight testing. I am con-

fident we have fixed the problem we encountered in the December 2010 test and we look forward to conducting the FTG–06B intercept test this summer.

I'm also optimistic that we have identified the root cause of the intercept failure involving our first generation EKV last July, when the CE–1 kill vehicle failed to separate from the booster's third stage. We have accounted for that issue and its probability in the upcoming flight test this summer and are working towards a correction for the entire fleet before the end of the year.

Instead of continuing to make year-to-year reliability improvements in our GBIs, in fiscal year 2015 we will begin to redesign and improve the GBI EKV. The new EKVs will be more producible, testable, reliable, and cost effective, and eventually replace the kill vehicles used in our current GBI inventory.

We will also begin development of the long-range discriminating radar, with deployment planned in 2020. The new midcourse tracking radar will provide persistent coverage and improved discrimination capabilities against threats to the homeland from the Pacific theater.

We will continue to improve the performance of the Aegis weapon system and request to procure 30 Standard Missile Block 1B guided missiles in fiscal year 2015. We will request 4-year multiyear procurement authority next year for the SM–3 1B starting in fiscal year 2016.

In fiscal year 2015, we will also procure in our request 31 interceptors for THAAD and fund additional AN/TPY2 spares and an additional THAAD battery for the Army.

We remain on schedule to meet the presidential mandate for the deployments of phase 2 and 3 of the European Phased Adaptive Approach. With 15 flight tests planned in fiscal year 2015, we will continue to test elements of the system to demonstrate they work before we commit to fielding.

Thank you, Mr. Chairman. I look forward to the committee's questions.

[The prepared statement of Admiral Syring follows:]

Senator UDALL. Thank you, Admiral.

General Mann.

STATEMENT OF LTG DAVID L. MANN, USA, COMMANDER, U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/ARMY FORCES STRATEGY COMMAND AND JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSES

General MANN. Chairman Udall, Ranking Member Sessions, Senator Donnelly, Senator King: Thank you for your continued support of our soldiers, civilians, and their families. This is my second appearance before this subcommittee and it is an honor to appear before you today to talk about the importance of missile defense for our Nation and the need to maintain these capabilities in the face of maturing threats and declining budgets.

Today I'd like to briefly discuss global missile defense operations, the Space Missile Defense Command/Army Forces Strategy Command's role as a force provider. To accomplish these assigned missions, we focus on three tasks, tasks that are very similar to what

I discussed during the space hearing: to provide trained and ready missile defenders; to build future missile defense forces and capabilities; and to develop future technologies.

In addition, I'd like to outline my role as the Joint Functional Component Command for Integrated Missile Defense, basically an operational integrator on behalf of Strategic Command. We execute four tasks in support of these responsibilities: first, to synchronize operational level planning; second, to support ongoing operations and asset management; third, to integrate training and exercises and test activities; and finally, to advocate for future capabilities.

This committee's continued support of missile defense capabilities and our soldiers, sailors, airmen, and marines and civilians who develop, deploy, and operate these missile defense capabilities is essential.

Again, I appreciate the opportunity to speak on the value of missile defense for our Nation and look forward to addressing any questions that you may have. Thank you.

[The prepared statement of General Mann follows:]

Senator UDALL. Thank you, General.

Ms. Chaplain.

STATEMENT OF CRISTINA T. CHAPLAIN, DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Ms. CHAPLAIN. Chairman Udall, Ranking Member Sessions, Senators Donnelly and King: I'm pleased to be here today to discuss recent GAO findings on missile defense acquisitions. As you know, for the past 12 years we've been mandated by the Congress to assess MDA's progress in developing and delivering missile defense capabilities.

Overall, MDA has accomplished a great deal since it was formed in 2002, developing and delivering a broad set of systems that provide important protection to our Nation and our allies. But several acquisition challenges have persisted since we began our reviews.

First, in the face of time pressures, MDA has employed high-risk acquisition strategies that overall development and production activities. While this practice has decreased over time, programs that began with highly concurrent strategies still face problems. For example, the recent failure during a test of the Aegis Standard Missile 3 Block 1B, just discussed, means that a component common to the 1B and the deployed 1A interceptor may need to be redesigned and flight tested. While the failure review is not yet complete, if a redesign is necessary interceptors that were already produced may require retrofits. MDA continues to procure new 1B interceptors while it investigates the cause of the failure.

Also, a July 2013 failure in the GMD system test means that MDA did not demonstrate the CE–1 kill vehicle could perform under more challenging conditions than previously tested, further delaying knowledge of the interceptor's performance capability.

The GMD program has had many years of significant and costly disruptions caused you production getting well ahead of testing and then discovering issues during testing. Consequently, even though some assets have already been produced, MDA has had to add tests

that were previously not planned and delay tests that are necessary to understand the system's capabilities and limitations.

In the 12 years we've assessed MDA acquisitions, we've also reported that testing has been hampered by reliability and availability problems with targets, as well as optimistic planning. MDA has worked to mitigate these risks. This year we reported significant progress in testing, with the first system-level operational flight test in 2013 that Dr. Gilmore just described.

A third area of challenges we have highlighted in the past decade is on reporting acquisition progress to the Congress. Our recommendations have included making sure baselines and annual reports are complete, that they follow best practices, that they better explain variances, and that they be stabilized.

For fiscal year 2013, the Agency's cost and schedule reporting still lack the clarity, completeness, and quality necessary to track actual costs and schedule growth over time. For instance, baselines were still not supported by independent cost estimates, nor did they fully reflect operations and sustainment costs.

In recent years, however, MDA has been devoting resources and attention to improving its baselines. For instance, we reported this year that MDA took steps to explain most of the significant cost and schedule changes both in the short- and long-term. MDA is also in the process of implementing new cost reporting standards based on best practices. As such, we anticipate significant improvements in our next review.

Lastly, in a separate review this year we found MDA has enhanced management for deploying missile defense systems in Europe under the EPAA. Also, key EPAA programs, such as Aegis Ashore, are making good progress. However, the success of the EPAA policy hinges on the delivery and integration of an array of complex systems. Further, while the United States is generally meeting its commitments, some capabilities specifically needed to achieve greater levels of integration are not planned to be delivered as originally anticipated. Since integration is critical to achieving the capability desired in EPAA, we have recommended that MDAA develop an integrated master schedule that pulls together the complex set of activities that need to be done. Such a schedule makes good sense whether we view EPAA as a policy or an acquisition program.

This concludes my statement and I'm happy to answer any questions.

[The prepared statement of Ms. Chaplain follows:]

Senator UDALL. Thank you, Ms. Chaplain.

Let me start. I think we'll do 7-minute rounds.

We've not had a successful intercept test with the ground-based midcourse system since 2008, as has been acknowledged. But we have had a series of test failures with both the early and most recent model of deployed kill vehicles. Admiral Syring, you've said your highest near-term priority is to return to a successful intercept test this summer to demonstrate corrections to the system.

I want to ask if each of our witnesses agrees that it is our essential near-term priority to fix the problems we have encountered with our current kill vehicles and to demonstrate those fixes in realistic intercept testing before we build or deploy any additional

interceptors. I assume these are yes or no answers, but I'll start with Ms. Bunn and move across.

Ms. BUNN. Yes, sir.

Senator UDALL. Dr. Gilmore?

Mr. GILMORE. I agree.

Senator UDALL. Admiral, I think you agree.

Admiral SYRING. Yes, sir. I'll keep it to one word, two words: Yes, sir.

Senator UDALL. General Mann?

General MANN. Yes, sir.

Senator UDALL. Ms. Chaplain?

Ms. CHAPLAIN. Yes.

Senator UDALL. Using that same approach, let me turn to acquisition rigor for redesign of the GMD kill vehicle. Given the numerous problems we've encountered with our current GMD kill vehicles, the budget includes funds to start a redesigned kill vehicle for the GMD system, one that will be reliable, robust, producible, and other attributes that are lacking in the current kill vehicles because we did not follow rigorous design, engineering, and acquisition process—practices, I should say.

I want to ask each of our witnesses if they agree that in order to avoid repeating the kill vehicle problems we had with the previous rush to failure approach, we need to follow a very rigorous acquisition approach to the redesigned kill vehicle, an approach that includes robust design, engineering, development, testing, and demonstration of a kill vehicle before we deploy it.

Could I ask if you agree to that as well? Ms. Bunn?

Ms. BUNN. Yes, Mr. Chairman. But could I add one thing?

Senator UDALL. Please, yes.

Ms. BUNN. And I think we've got the right man to add that rigor to the acquisition process.

Senator UDALL. Thank you for that.

Dr. Gilmore.

Mr. GILMORE. I view that as essential.

Senator UDALL. Admiral?

Admiral SYRING. Absolutely critical. We have one chance to get this right.

General MANN. Yes, sir.

Senator UDALL. Ms. Chaplain?

Ms. CHAPLAIN. Yes. Thanks for asking.

Senator UDALL. Thank you for answering.

Let me try the same format one final time, and I want to move to fly before you buy from missile defense. Admiral Syring, your prepared statement makes clear that you are following a fly before you buy approach on the GMD system, and that you will not build or deploy additional ground-based interceptors unless we have successful flight test results first.

I have a two-part question, first to ask you, Admiral, if you plan to use the same approach before deploying further variants of the ground-based interceptor? And then after you've answered, I'd like our other witnesses, if they agree that we need to follow this fly before you buy approach. Admiral?

Admiral SYRING. Sir, in this year's budget request we've asked for, requested an intercept test every year on an annual basis be-

tween now through the FYDP. But to address your question on 2017, there's an interceptor test that's scheduled before each next block of the interceptors is fielded. I'm confident that that will test the configuration before it goes into the ground adequately. As I've said before, intercept testing on an annual basis is a critical need for the GMD program.

Senator UDALL. Ms. Bunn.

Ms. BUNN. Mr. Chairman, the fly before you buy was a policy enunciated in the ballistic missile defense review of 2010 and it continues to be our policy.

Senator UDALL. Thank you.

Dr. Gilmore.

Mr. GILMORE. I agree. I'd just like to add one thing, and that is that the modeling and simulation that I discussed in my opening statement is also critical here, because we're never going to get enough replications to reach conclusions about statistical confidence in the system without rigorous modeling and simulation.

So the flight testing and the modeling and simulation go hand in hand, and in fact I've been working with Vice Admiral Syring and his predecessors to assure that that's the case. Both are needed.

Senator UDALL. General Mann.

General MANN. Yes, sir. We're in total agreement with MDA's way ahead and the importance of testing.

Senator UDALL. Ms. Chaplain.

Ms. CHAPLAIN. Yes, we agree with the importance of fly before you buy.

Senator UDALL. Let me direct a question to Admiral Syring, General Mann, and Ms. Bunn. You've each indicated that, in addition to improving interceptor reliability, our investment priority for homeland defense is to improve our sensor discrimination capability, rather than deploying an additional interceptor site on the east coast. The budget requests funds for a number of sensor and discrimination improvements.

Can you each tell the committee why improving our sensor and discrimination capabilities is so important and how it will improve our existing homeland defense system? For example, would they allow us to defeat more ICBM threats with our planned number of interceptors, thus making the system both more operationally effective and more cost effective? Ms. Bunn, do you want to take a shot at that first?

Ms. BUNN. Yes, sir. What you said, that is that better discrimination makes the interceptors we have more effective and more efficient.

Senator UDALL. Admiral.

Admiral SYRING. Sir, as the enemy continues to increase in both capacity and capability, the need for discrimination in sensoring is vital to, one, address those capability improvements of the enemy threat and, two, to get the most intercept capability out of our inventory of interceptors. Both are critical to the escalating capability and capacity of the threat missiles.

Senator UDALL. General Mann.

General MANN. Yes, Senator. I think it's acknowledged that we'll never have enough interceptors to address the size of the threat in-

ventory out there. So it's very, very important that we're as effective as we are with what we have. Also, by improving the effectiveness of the missile we also—it gives us a little bit more breathing space in terms of how we operationally employ the system. I'll leave it at that. Thank you.

Senator UDALL. Could I follow up. There's of course no limit to what you could do. There's always a limit to resources. What I hear being said is that it's a higher priority to improve our sensor discrimination capabilities than it would be to deploy an additional interceptor site on the east coast. I say that in the context that we don't have unlimited resources.

Ms. Bunn, would you comment on that, and then the Admiral and the General?

Ms. BUNN. Yes, sir. The priority for this budget is in improving the EKV on the interceptors that we have, redesigning that, and improving the discrimination. While an east coast site might provide additional defense against an emerging, not yet here threat from Iran, the next dollars spent need to be on EKV improvement and discrimination and sensors.

Senator UDALL. Admiral, do you have anything to add to that?

Admiral SYRING. Sensors and discrimination, really on an equal priority with improving GBI reliability. They both inform the warfighter shot doctrine.

Senator UDALL. General?

General MANN. Yes, sir, I concur with the previous witnesses.

Senator UDALL. Thank you for that.

My time is up. It's my privilege to recognize Senator Sessions, the ranking member.

Senator SESSIONS. Thank you.

You know, testing—Dr. Gilmore, testing has proved that we can utilize a kill vehicle to kill on a hit-to-kill basis, through the other tests of other systems; is that correct?

Mr. GILMORE. That's correct.

Senator SESSIONS. I mean, the concept is proven, and we're doing it in others. But with our GMD system is the one that's the most lacking and problematic at this time?

Mr. GILMORE. We have the least information——

Senator SESSIONS. The least testing.

Mr. GILMORE.—about the performance across the full possible battle spaces, to use the colloquialism, for GMD in comparison with the other elements of the BMDS.

Senator SESSIONS. So that the THAAD, the Theater High Altitude Area Defense, is 11 for 11 in its tests as I understand it. Aegis is 18 for 21, Patriot 21 for 25. We were successful with the satellite engagement launch. But we're 3 for 6 on ground-based midcourse.

Mr. GILMORE. Yes, that's correct. And in fear of adding too much, I would also point out that, yes, THAAD has a very good record, although we've only just in the past couple of years started testing against medium-range ballistic missiles. A lot of the testing had been against short-range ballistic missiles, and now THAAD is deployed on Guam because Guam otherwise wouldn't have a defense against an intermediate-range ballistic missile. And coming up shortly, Vice Admiral Syring, at the request of the combatant com-

mands, is going to do a test of THAAD against an intermediate-range ballistic missile.

So there's still—I certainly agree with all of the figures that you just cited. They're absolutely correct. I would just point out that there's still more to learn about the performance of these systems, and it's not just from the standpoint of what an independent operational tester might want to know. It's actually, even more importantly, from the standpoint of what the combatant commanders want to know about how these systems will be used, how they want to use them, and how they will perform.

Senator SESSIONS. Good. I just think it's important that the Americans and our adversaries know that we have very effective missile systems that will work, but we've got some testing to do.

Admiral Syring, my impression is that you are firmly convinced that testing must be more vigorous than we've had in the past and that you intend to see that that happens. Would you share your personal view with us about what it takes to ensure we have a viable missile defense system?

Admiral SYRING. Yes, sir. As you know, we've added and are requesting one GMD missile test every year now. I would say that we hadn't done enough before, for whatever reason. We haven't done the work necessary for us to give—to improve the models, to give Dr. Gilmore confidence in an assessment of the system. All of that has been lacking.

But it's all anchored in flight testing and the need to test more often and for us not to be afraid to test. To not test a CE–1 interceptor for almost 5 years is not where we want to be long term. We want to continue to test and we'll continue to request annual testing of the GMD system.

Senator SESSIONS. I couldn't agree more.

Ms. Bunn, how is it that—we thought we were putting in money for testing for the last several years. It's really sort of surprising to me that we haven't had a GMD test in 4 years. Can you explain that?

Ms. BUNN. Sir, I've been in this office for a year, so I don't have quite the history for that. Could I defer to Dr. Gilmore?

Senator SESSIONS. Well, let's ask Dr. Gilmore. He's been there.

Ms. BUNN. He may have a more——

Mr. GILMORE. We've had tests, Senator. The last successful test——

Senator SESSIONS. Is he responsible to you?

Ms. BUNN. No, sir. No, sir. We all work together quite closely, but no.

Senator SESSIONS. No, you have different roles, okay.

Mr. GILMORE. I'm the independent tester.

The last successful intercept that we had——

Senator SESSIONS. Explain that? You're part of the Defense Department——

Mr. GILMORE. Sure.

Senator SESSIONS. But your role is set up to be an independent tester of the systems.

Mr. GILMORE. Correct.

Senator SESSIONS. To help Congress and others know that we're getting accurate testing, realistic testing, on the kind of situations we might face.

Mr. GILMORE. I'm charged by law with assuring the testing is adequate, meaning it is set up to give us the information we need about how the systems will perform in realistic combat conditions. I think that's an exact quote from the law. Then it's my responsibility to report factually, comprehensively, and objectively on the test results. I'm supposed to not be an advocate for the system. I am not. So I'm supposed to have no stake in the outcome one way or another and just serve up the facts the way they are, which is what I have tried to do.

Senator SESSIONS. Well, how is it we didn't do much—we haven't done any sufficient testing on GMD in the last several years?

Mr. GILMORE. We have actually—the last successful intercept was in December 2008. Since that time we've actually done a bit more. We've attempted a bit more than one test per year. Unfortunately, with the exception of the captive carry test that was conducted last year of a partial solution to the problem that was manifested in the CE–2 kill vehicle failure in FTG–06A—that was a success, but it was a non-intercept test—all the other tests have failed.

So we have been attempting to test, and in fact Admiral Syring had set up tests that were exceeding somewhat the pace of one per year. But unfortunately, because of problems with the kill vehicle and its design, those tests have failed. The very first failure, in FTG–06, had to do with a quality control issue. A cable wasn't securely fashioned and came loose in flight.

Then there was the problem that was discovered in FTG–06A with the IMU saturating because of vibrations in the structure of the kill vehicle, and that was unanticipated. Then there was the most recent failure——

Senator SESSIONS. Which is the reason you need to test, right?

Mr. GILMORE. Absolutely.

Senator SESSIONS. It's unanticipated.

Mr. GILMORE. Essentially, all of these failures, but you can put the quality control issue with the first failure in a separate bin if you would like. The other failures that have had to do with the IMU, for example, it saturating, and the failure with the CE–1 to separate, those are failure modes that really can't be predicted by modeling and simulation.

The modeling and simulation, although it's essential, basically assumes that the kill vehicles will function mechanically, for lack of a better way to put it, the way that they're supposed to. However, it's turned out there have been some surprises there because of the way those kill vehicles were designed.

Senator SESSIONS. Admiral Syring, my time is basically up, but you intend to continue to deploy the next 14 interceptors. You will place on those what kind of kill vehicle? And then you have a plan to develop an entirely new kill vehicle that would replace those in the future—I mean, those that have already been placed on the system?

Admiral SYRING. Yes, sir. The plan to get to 44 by 2017 includes reliability improvements to the CE–2 interceptor. There's been——

Senator SESSIONS. That's the one now?

Admiral SYRING. Yes, sir, that's the current interceptor that we will fly this summer. There's small reliability—not small, but reliability improvements on top of that, that will be tested in fiscal year 2015 and 2016. One example would be the alternate divert thrusters, which will address the systemic problem of vibration that we addressed with isolating the IMU to get at the heart of the problem, to address not only the IMU issue but another issue we had with the divert system.

So again, before those are fielded we'll go through intercept testing and prove to me and to Dr. Gilmore that we're ready to go.

Senator SESSIONS. And then finally, you will be bringing on a system that I guess uses some of the proven technology of the SM–3 and Patriot and THAAD for the future?

Admiral SYRING. Yes, sir. The components of those systems, which you articulated very well in terms of their success, would be candidates for the EKV design. And we've got three very interesting, viable, technically capable concepts from three companies that we'll be evaluating over the next year as we continue to work on requirements in the kill vehicle arena as well.

We've got to get the kill vehicle requirements right. We've got to get the homeland defense requirements allocated properly across all parts of the kill chain, of which the kill vehicle is one.

Senator SESSIONS. Thank you.

Senator UDALL. Senator Donnelly.

Senator DONNELLY. Thank you, Mr. Chairman.

Thank you to all of you.

This would be for whoever wants to answer the question. We've seen extraordinary circumstances in the Ukraine, along the border there, and actions taken by Russia and their leader. One of the things that had been worked on was a missile defense system very nearby. So I am wondering as to—we obviously have Navy ships in the area. But I am wondering if there has been any further discussion since these activities started where Russia invaded Crimea, massed troops on the Ukrainian border? Has there been any additional discussions with Poland, the Czech Republic, Romania, and other nations about the missile defense systems we have there?

Ms. BUNN. Senator Donnelly, let me say a couple of things here. As you know, the NATO missile defense, the EPAA, was designed against threats from the Middle East, not Russia.

Senator DONNELLY. I understand that.

Ms. BUNN. In general——

Senator DONNELLY. However, it was of significant concern to Mr. Putin as well.

Ms. BUNN. Yes, sir. Yes, sir, it was.

In general, I would say that Russia's intervention in Ukraine in violation of international law has put into flux a lot of our policies with regard to Russia. As Secretary General of NATO Rasmussen said yesterday, we are—NATO is considering a lot of options for dealing with Russia now, relooking at its policies. General Breedlove calls it a paradigm shift.

So let me just say that the government's looking at a lot of options, the USG, NATO, yes, economic and diplomatic, but also what military options for strengthening collective defense. I don't want

to get out in front of, in open session, out in front of our NATO allies.

Senator DONNELLY. Have you been speaking with our allies in Poland or in the Czech Republic or in Romania or our NATO allies?

Ms. BUNN. We've had a lot of discussions with them on a number of issues. I don't want to—as I say, I don't want to get out in front of our allies——

Senator DONNELLY. Well, do you think it's——

Ms. BUNN.—on a particular option.

Senator DONNELLY. Do you think at some point it would be a good indication to Mr. Putin to tell him we are working on these things, we are moving forward with these things, we are strengthening these things?

Ms. BUNN. I think indeed that's one of the reasons Secretary General Rasmussen came out, after the NATO ministerial of all the foreign ministers yesterday, and said we are looking at lots of ways to enhance our collective defense.

Senator DONNELLY. Okay. I guess maybe it's a game of semantics, but are we at some point planning to tell him that we're not just looking at them, but we're moving forward with some of them?

Ms. BUNN. Indeed, there have been things. We've moved forward with, obviously, some reinforcements of aviation detachments, Baltic air policing. So there are some steps that have already been taken. And yes, there will come a point where——

Senator DONNELLY. I understand you may have to talk around this a little bit as well, but how long would it take to finish the missile defense shield system in the region?

Ms. BUNN. They are—the plan is 2015 and 2018 for the next two phases. If you're asking what's technically feasible——

Senator DONNELLY. Have we talked to them about moving up those time lines? Mr. Putin apparently has no interest in time lines. So you know, he's not going to wait for 2018. His interests are not the same as ours.

Are we taking a look at our time lines and other things in regards to that? And are those time lines that are flexible, that can be moved up if necessary?

Ms. BUNN. No discussions at this point with them——

Senator DONNELLY. By "with them" who do you mean?

Ms. BUNN. You asked about——

Senator DONNELLY. Our allies.

Ms. BUNN.—the Nations——

Senator DONNELLY. Yes.

Ms. BUNN.—specific nations. But I would—I guess I would defer on the technical, what's possible, to Admiral Syring.

Admiral SYRING. Senator, if I can, the Poland capability——

Senator DONNELLY. Is your mike on?

Admiral SYRING. Yes, sir.

Senator DONNELLY. Okay.

Admiral SYRING. The Poland capability in 2018 is on track. The program of record is doing well. It is hinged on two things. It's hinged on the SM–3 Block 2A development schedule, which is progressing well with our Japanese partners, but again paced by development progress, schedule, and funding. And then the actual site proper for the MILCON and the equipment. We've proven very

successful in Romania. We've built the site now in Moorestown and at PMRF out in Hawaii. We'll build it again in Romania here before next year.

All of that funding is mostly in the fiscal year 2016 timeframe. So to go faster it would require money in 2015 in terms of the technical feasibility of accelerating, which I don't have.

Senator DONNELLY. So it is not—it may be more a question of money than the ability to technically move up time lines if we need it?

Admiral SYRING. It's money and it's the SM–3 2A development schedule.

Senator DONNELLY. Okay. When we look at our Navy-based systems—as we talked about, much of the ground-based is in concerns about Iran, but obviously caused concern by the Russians as well. With the Navy-based systems, they can be, based on where the ships are and the angles and all those things, they can cover other areas besides Iran. They can cover Russia if necessary, couldn't they?

Admiral SYRING. In this forum I'll say they can cover a wide range of geographic areas.

Senator DONNELLY. Okay. When we look at Iran—and again, whoever wants to answer it—what is your best judgment on how far they are right now to having a nuclear weapon completed? And obviously, you know, they're in discussions now, but if they were to decide, okay, the discussions didn't work out, how long would it take for them to reach completion?

Ms. BUNN. Senator, for the record I'll go back and look at the DNI's worldwide threat assessment. As you know, we're trying to get them not to go there.

Senator DONNELLY. I'm hopeful of that, too.

Ms. BUNN. Yes, I understand. But let me get that for you for the record, because it's an intelligence assessment.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator DONNELLY. And if they complete that, do they have the delivery systems in place already to deliver it?

Ms. BUNN. They have short- and medium-range missiles already. That's the reason for the EPAA in Europe. They have those short- and medium-range missiles already. They're working on a longer-range missile.

Senator DONNELLY. Does that long-range—would that longer-range missile reach our country?

Ms. BUNN. If they are successful in developing and testing that. They are trying for it, and so yes, they're trying for one that would reach us.

Senator DONNELLY. Unfortunately, my time is up. Thank you, Mr. Chairman.

Senator UDALL. Thank you, Senator Donnelly.

Senator King.

Senator KING. Thank you, Mr. Chairman.

Would you give me an update—I guess, Ms. Bunn, maybe this is you; or if not, whoever the appropriate person is—on the status of the environmental impact statements on the four locations for the ground-based interceptor site, the east coast site?

Ms. BUNN. I will just—Admiral Syring is actually the best for that, because MDA has named the four sites and they've begun the environmental impact statement on the—let's see, Michigan, Maine, Ohio, and New York. And I will ask Admiral Syring, with your permission.

Senator KING. Michigan's on the east coast? I hadn't noticed that.

Ms. BUNN. In the eastern part of the United States, even though Michiganders might not like to——

Senator KING. The guy from Indiana——

Ms. BUNN. They don't want to call themselves——

Senator DONNELLY. Chairman Levin will be surprised. [Laughter.]

Senator KING. Oh, that Chairman Levin.

Admiral?

Admiral SYRING. Yes, sir. We completed the down-select in January of this year to the four sites, and it's Portsmouth SERE up in Maine, Fort Drum, New York, Camp Ravenna in Ohio, and—I'll get it wrong—Fort Custer in Michigan.

The EIS process has started. We've said it's going to take us—it will take us 24 months to complete that. That's actually faster than the historical DOD EIS process, but we're confident that we've got a great team in place that does this in terms of deployment for other systems that we deploy around the world.

We'll develop a contingency plan, and you know what that is, Senator, in terms of how would you do—how would you actually build the site, how would you design the site, how would you field what we call it, is a CONUS interceptor site, since it is both midwest and the east, based on the threat trajectories of the areas that we're considering. That'll be a cost, schedule, acquisition-focused contingency plan.

We've actually already developed a very detailed requirements document, overarching requirements document, that we've been working on for the last 6 months. That'll inform the contingency plan and the detailed plan for all four sites to not wait if the decision is so made, to be able to get on with it if the requirement comes from the combatant commander and the Department makes that decision.

Senator KING. So you'll have essentially a mockup of a plan, so you don't start from scratch after the EIS?

Admiral SYRING. Yes, sir. There's a plan—there's planning work that can go on at a level below the detailed planning level, that will be done on each of the sites, so we don't have to wait another 2 years for that work to be done. We can do a lot of this work in parallel prior to selecting a site, that will be then tailored to the individual site that we select.

Senator KING. Thank you.

I was in Israel a few months ago and visited an Iron Dome site. Talk about real-time R&D. Are we—I understand that we're doing a lot of funding of that system, but we're also getting a lot of the intellectual property back. Are we incorporating—and I know that's a different, that's not intercontinental. But it's certainly missile defense and it seems to be working. They claim an 85 percent efficiency.

Are we learning anything from that, from that system?

Admiral SYRING. We are. Let me address programmatically what we're doing and then I will pass it to General Mann if that's okay in terms of what the Army may be looking at. We were very successful with the Israelis to sign an Iron Dome coproduction agreement this year, which will set us up for 30 percent of production of that interceptor in the United States this year, 55 percent next year, which is a good thing for us and it's a good thing for Israel that that's in place, because we'll have a second source for the provider of that interceptor.

We've also requested in this year's budget $175 million for Iron Dome, both interceptor and battery procurement, that will be informed in terms of how many interceptors, how many batteries we actually buy, through the coproduction work that's going on.

There's a very detailed contract negotiation that's going on between Rafael and Raytheon today. We don't have any privity of contract on that, so our insight is somewhat limited. But I'm confident that as we allow that process to work forward that the right answer will come out.

Senator KING. But you're satisfied with the privity of intellectual property, if you will, that we're learning the lessons along with them?

Admiral SYRING. Yes, sir. Yes, sir, the design and the technical data packages come, are coming and will come with it.

Senator KING. Now, having been through this hearing last year and then a briefing afterwards and another hearing today, it's clear that this is a tough problem. This is a tough scientific problem, physics problem. Are we thinking about alternatives? Is it possible, instead of sending a missile up, high-powered lasers or some other alternatives to this, what is appearing to be a very difficult piece of construction and engineering?

General MANN. I'll take this. I don't know if Admiral Syring wants to jump on. But there's a lot of different efforts that are under way. When you're talking about cruise missiles or rockets, artillery, mortars, things like that, we're looking at directed energy very, very aggressively. In fact, we've already had a successful test back in December of last year in the 10 kilowatt range, where we were able to knock out mortars and it was also effective against UAVs.

What we're doing right now is we're working with the Navy. We've transported that demonstrator to Florida and we're doing testing with the Navy under more environmentally challenging scenarios. We're looking at by 2017 we could probably get up to the 50 kilowatt. Again, we're looking at threats that are low-level threats, whether it's UAVs, possibly cruise missiles.

I know that MDA is also looking at directed energy, really looking at a higher level platform, maybe post-launch or post-boost level type engagements. So we're working collaboratively with MDA to really leverage, like you were talking about, other technologies, in this case directed energy.

Senator KING. But in dealing with an intercontinental missile, the only option is another missile at this point?

General MANN. At this point.

Senator KING. One of our advantages is naval power. I'm worried about anti-ship missiles. How do we—in terms of missile defense, how do we—is that up to the ship or how do we think about missile defense of our naval vessels?

Admiral SYRING. I'll talk about the ballistic missile defense and then General Mann can talk about the cruise missile defense of the ship. We've got a very robust sea-based terminal defense program that's requested in this year's budget, that helps us to defend the carrier sea base against that exact threat. I'd like to share the details of that in a classified forum, but it's based upon the SM–6 missile that the Navy has successfully tested and developed.

Senator KING. I'd like to, if we could follow up, have that briefing.

Admiral SYRING. Yes, sir, we'd be happy to.

Senator KING. Cruise missile defense?

General MANN. Again, cruise missile defense, right now I think there's nine countries that are currently aggressively involved in cruise missile technologies, and I think there's another 20 that's looking into this. Right now—I talked about using directed energy as a technology that we can leverage to get after that threat.

We're also right here locally—I think you all are aware of JLENS, the Joint Attack Netted Sensor, that aerostat that we're going to be placing at Aberdeen Proving Ground. It's going to be a test from fiscal year 2014 through 2017. We're working with NORTHCOM on this, and that basically provides greater surveillance and fire control radar capabilities, so when netted with interceptors like the NASAMS that we have here locally that's protecting the National Capital Region—we're going to do a test that will provide us with greater range, greater sensor coverage of this area. We're looking forward to learning from that to help us get after the cruise missile threat, which, as we know, is growing.

Senator KING. It's a serious threat.

General MANN. Yes, sir.

Senator KING. Admiral, I can't resist. The studies you're doing for the east coast site remind me of when God came to Moses and said: I have good news and bad news. The good news is I'm going to empower you to part the waters of the Red Sea and let my people escape to freedom. Moses said: What's the bad news? God said: You have to prepare the environmental impact statement. [Laughter.]

Thank you, Mr. Chairman.

Senator UDALL. Thank you, Governor King.

Let me turn back to the GMD system and the question whether it protects all of the United States. I'll direct this to General Mann, Admiral Syring, and Ms. Bunn. In your prepared testimony you each state that the current ground-based midcourse protects the United States against a limited ballistic missile attack from North Korea and from potential Iranian ICBMs. This is an important point. I want to make sure the record is clear on this since there seems to be some confusion on this subject on the Hill.

So, Ms. Bunn, is it correct that our current GMB system covers the entire United States, including the east coast, from missile threats from North Korea and from Iran?

Ms. BUNN. Yes, sir, that's certainly my understanding.

Senator UDALL. Yes, Admiral Syring?

Admiral SYRING. Yes, sir.

Senator UDALL. And General Mann?

General MANN. Yes, sir.

Senator UDALL. On that note, General Mann, is that why your prepared testimony says, quote, "As the Secretary of Defense and various combatant commanders have previously testified, the warfighter remains confident in our ability to protect the Nation against a limited ballistic missile attack, even in the face of a changing fiscal environment"?

General MANN. Yes, sir. But it also goes to the point where we need to continue to improve our technology, whether it's sensor discrimination, EKV improvements, because we know that the threat is not just satisfied with the current capability.

Senator UDALL. It's not static.

General MANN. Yes, sir.

Senator UDALL. It's not always symmetrical, either.

Ms. Bunn, let me go back to this question. In addition to the EPAA, we are pursuing regional missile defense enhancements in the Middle East and Asia, including significant efforts at cooperation with our allies and partners in each region. From a policy perspective, can you describe what we are trying to accomplish with our allies and partners in each region, including our efforts in the Middle East, with Israel and with the Gulf Cooperation Council, and our efforts in Asia with Japan and South Korea?

Admiral Syring and General Mann, after the Secretary comments, if you have anything to add we'd appreciate it for the record.

Ms. BUNN. Well, Mr. Chairman, as General Mann pointed out, as we've all pointed out, the supply of short- and medium-range ballistic missiles is greater than the number of regional defense missile interceptors that we have and will have for the foreseeable future. So I think for protecting both our deployed forces as well as our allies and partners, it's important for others to also have their own missile defenses. And it's also important to net them together to make them interoperable in a way that the sensors that we each have can share information and make the use of each of our missile defense capabilities more effective, more efficient.

So as you know, in the Middle East we have a longstanding cooperative relationship with Israel. It goes back almost 28 years now. I was doing the math. I was the action officer for the first agreement with Israel. And that—in 1986. And that is a longstanding cooperative relationship.

We are making efforts with the Gulf Cooperation Council, as I said. A number of those countries are acquiring and interested in acquiring their own missile defense capabilities and, as the Secretary of Defense said in Manama recently, that working together, trying to get the GCC to also see that sensor interoperability, sensor sharing, makes every country's missile defenses more capable.

In the Far East, certainly with Japan, Japan is also—that was the other missile defense agreement in 1986. Japan we've had a longstanding cooperative program with, and in fact we are co-developing right now the SM–3 2A with the Japanese. They have their own deployed *Kongo*-class ships as well with missile defense capa-

bility. And South Korea is examining some integrated air and missile defense, moving forward on that as well.

Senator UDALL. Thanks for that update.

Admiral?

Admiral SYRING. We're doing a lot around the world. Let me just highlight some of the main points, and I'll just add to what Ms. Bunn said. The NATO command and control system I think was a huge success in terms of that being operational at Ramstein and connected with our command and control system for the first time ever. That will enable us to add nodes to basically both networks in Europe.

Spain has been very forthcoming and we're very thankful for their ability to host the four destroyers in Rota as part of EPAA. Turkey, as you know, hosted the TPY2 site. The Netherlands and Germany have stepped up with Patriot in Europe, as you know, with Patriot batteries. Romania and Poland, their ability to host our Aegis Ashore sites and their willingness to accept our systems there I think goes without further mention.

Israel, again just a great partner, partnered on actually three development programs with them: Iron Dome, Arrow 2, Arrow 3, and David's Sling, four programs if you include Iron Dome.

Asia, Japan, just shift to the west, the Japanese in terms of the SM–3 2A development program, but they have got the Aegis destroyers that have BMD capability on them as well, that actually serve on station. And we're in active discussions with them on how to upgrade their capability as well.

In the Gulf, back east, great progress with the UAE in terms of the THAAD agreement that we signed with them. I'm working actively for more opportunities across the Gulf region in the next year and hopefully we'll come back and report progress there.

Then South Korea, I think we're in the formative study discussions, just answering some of the questions that they have as well.

Finally, there's a lot of countries that have been discussing and are asking questions about how their ship sensors can help and how they can contribute to BMD in terms of search and track capability on our network.

Senator UDALL. General, do you have any additional?

General MANN. Just very quickly, Senator. In addition to the material acquisition programs that we're talking about here, we do a lot of collaborative exercises with a lot of our allies out there, especially in the CENTCOM AOR. I'm also about to do a capstone exercise later this month that's going to involve 22 nations.

At those exercises, not only do we get into in some cases tactics, techniques, and procedures, but we also get into some of the policy issues related to sharing of data, which sometimes causes some sticking points on sharing data, whether it's sensor data or whatever it might be. So very robust engagements are ongoing right now with our allies.

Senator UDALL. The three of you took us on quite a tour. It's impressive what we're doing. I know we want to do more.

I know my time is about to run about. But Admiral Syring, a short, concise comment, if you could, on what would happen if sequestration came back fully in fiscal year 2016?

Admiral SYRING. It would put all of the efforts that we have requested to begin development back on the table.

Senator UDALL. Thank you.

Senator Sessions.

Senator SESSIONS. Well, let me just tell you, you're going to be looking at $521 billion. Is that sequestration or not? It's the same you had last year. Does that mean you can't fund what you've been talking about? We're talking beyond each other, like ships in the night, it seems to me, about numbers.

Admiral SYRING. Sir, with——

Senator SESSIONS. There is no more cuts if we stay on the Budget Control Act numbers. So if we—I'm trying to figure out what we're saying here. That's what I was asking at the very beginning.

Admiral SYRING. If we take a cut, be it to the proposed fiscal year 2016 program——

Senator SESSIONS. The proposed program?

Admiral SYRING. Yes, sir, the requested program from the Department.

Senator SESSIONS. And the Department is requesting more than the Budget Control Act?

Admiral SYRING. We haven't put a 2016 budget together yet. We've put together a 2015 budget that assumes controls in 2016.

Senator SESSIONS. Well, you better not be counting on spending more money than the Budget Control Act, because we've already got extra money this year and next year. If we can get by spending at 521 this year and 521 next year, we go up $13 billion a year thereafter, we've made it past the danger period, which was this year and next year, really were the most crisis years.

But we're going to have to keep talking about that, because there's just confusion out there. I do think sometimes our Defense Department is talking about the projections that assume more money than is in the BCA, assume we will have to have another vote to bust the budget and spend above that, and sometimes they're not. So it's confusing. We need to be apples to apples when we talk about these numbers.

Admiral Syring, so this redesigned kill vehicle that need for the GBIs, the first test of that is supposed to be in 2018. When can we expect and you would hope and expect to be able to retrofit our 44 GBIs with this new system?

Admiral SYRING. Sir, the budget request asks for two flight tests in fiscal year 2018 of the new kill vehicle, first a non-intercept test and then an intercept test. But I would just caution that as we develop the acquisition approach and strategy you have my commitment to make sure that we don't cut corners and we do it right.

Right now I think we can make a flight test in 2018, for a fielding of the first interceptor by 2020. But again, that's going to be informed by proper design progress and testing progress.

Senator SESSIONS. What can you tell us in a public forum about the intelligence estimates of Iran and North Korea with regard to a missile system that can reach the United States?

Admiral SYRING. The Iranians are—the intelligence estimate is they're able to flight test, the projection is, to flight test an ICBM by 2015.

Senator SESSIONS. And we don't doubt that they eventually have the capability to make that a successful missile if left to their own devices?

Admiral SYRING. I'd like to take that into a classified forum, sir.

Senator SESSIONS. They've made progress with missiles. They're pretty sophisticated in them, as are the North Koreans. We would think, as much as their people suffer, it's not possible, but it apparently is possible. They already have proven fairly sophisticated technology.

Admiral SYRING. They are making capability improvements and capacity improvements every day.

Senator SESSIONS. Now, the plan, General Mann, to protect Europe and what we are trying to do there—maybe this is your question—that plan is to deal with Iran, not Russia; is that correct?

General MANN. That is correct.

Senator SESSIONS. We're not pretending that we have the capability to protect Europe or the United States from a massive Russian launch.

General MANN. Senator, you're correct. That is for threats emanating out of the Middle East, Iran.

Senator SESSIONS. Well, it's something I hope we can be successful on. I know we can if we work on that.

So thank you. I yield back my time.

Senator UDALL. Senator King.

Senator KING. One question. Admiral Syring, you said several times in your last answer, you talked about networks and connecting networks in Europe. It raises the question of how—are you thinking as you develop this project about cyber vulnerability? Because the good news is we have a very good, interconnected, wired society. The bad news is it makes us very vulnerable to cyber attack.

Are you—is part of your design strategy cyber attack resistance as far as the command and control and the networks that connect the sites and those kinds of things?

General MANN. Yes, sir. A very robust cyber program within MDA.

Senator KING. Good. Thank you. I appreciate that.

Thank you, Mr. Chairman.

Senator UDALL. Thank you, Senator King.

We've got a few more minutes. I've got a few more questions, so I'll pick up where we left off on the budget. General Mann, the budget request, if it was approved by Congress, does it meet the needs of the warfighter for improving our missile defense capabilities?

General MANN. Yes, Senator.

Senator UDALL. Admiral Syring, does the budget request put us on a path to improving our ability to defend against both homeland and regional missile threats? And if so, what are some of the initiatives that will provide such improvements?

Admiral SYRING. It does put us on that path, sir. The one marker I'll put on the table is that discrimination capability to the east is equally important, and long-term we're going to be looking to address that gap. Right now the strategy would be to move SBX to the east as the long-range radar is built to the west.

The other gap I would say would be infrared, IR, sensing capability, which is heavily in the R&D phase right now, and we're working hard on that.

Senator UDALL. I know Senator Sessions and you had an exchange about the budget. We talked briefly about ensuring that we're all on the same page, apples to apples, oranges to oranges. There will be additional time to discuss that as we move forward, and we'd welcome clarifications, additional information, in the testimony you'd submit for the record. I think it is important to understand where we are.

Ms. Chaplain, you've been patient. You're the watchdog that we all appreciate being involved. The GAO has been a consistent advocate for the fly before you buy approach and has warned for years that deploying missile defense systems before they're fully developed and tested could end up taking more time and costing more money than using a more rigorous acquisition approach.

We've spent I think at least 3 years trying to diagnose and fix the problems with the kill vehicles for the GMD and have conducted or will conduct a number of very expensive and previously unplanned flight tests to demonstrate those fixes. Can you give us a rough order of magnitude of what it has or will cost us to try to fix these problems after the fact, including the additional flight tests? I imagine it may be over $1 billion.

If we had used a more rigorous fly before you buy approach with GMD, do you believe we might have been able to avoid those additional costs? I ask the second question not to pile on, but just because everybody in this hearing wants to learn from mistakes, shortcomings, you name it.

Ms. CHAPLAIN. Our estimate for fixing the problems in the flight tests and recovering from it is at $1.3 billion right now. So it is close to what you said, even more than that. We do believe those costs could have been avoided had a fly before you buy approach been followed. [Pause.]

Senator UDALL. Excuse me for not—thank you for that clarification. As the hearing comes to a close, I wanted to see if Senator Sessions had any other questions he might like to ask.

Let me ask one more and go back to Dr. Gilmore. You've approved several versions of the integrated master test plan. That lays out the schedule and the testing for—the objectives, I should say, for missile defense testing. There have been suggestions that we should substantially increase the pace of testing our missile defense systems, particularly our ground-based midcourse defense system, and that that would greatly help accelerate system development.

Could you comment on the factors that drive our testing pace and whether you think we should or could accelerate testing significantly above the currently planned test pace? Although there have been some changes and delays in the testing, can you explain whether we've been able to really put in place a plan that helps us understand how we move forward?

I know you've been speaking of this. You're clearly the historian and the expert on much of this.

Mr. GILMORE. The historical pace of testing has been about 1.2, not to be too precise——

Senator UDALL. I want you to be precise.

Mr. GILMORE.—ground-based missile defense tests per year over the last decade since 2000. Early on the flight test pace was a little higher than that. It was up around 1.3, 1.4.

Senator SESSIONS. Are those complete tests? Or are some of those partial tests of the system?

Mr. GILMORE. I'm counting the tests that were meant to conduct intercepts.

Senator SESSIONS. Actual intercepts?

Mr. GILMORE. Yes. I can give you the details. I think I'm correct on that.

And it's also true, because I've reviewed the historical record, that both General Kadish and General Obering had testified at various times on their plans for the program before this subcommittee and other committees that they hoped to be able to do three or four tests a year. And they were never able to achieve that.

Would it be good to be able to do three or four or more tests per year for the ground-based missile defense system? Yes, it would. Can I sit here and say that there is absolutely no way that can be achieved with additional money? No, I can't prove that. But I can point to the historical record, where at least two MDA directors tried to increase substantially the pace of testing beyond one per year and did not succeed.

I can only guess to some extent, while that's true, but I hope you'll regard it as an educated guess, and this is based on my interactions with Vice Admiral Syring and his staff and his predecessor. There is just a certain amount—these are very complex tests and there's a huge amount of data that are collected, that have to be analyzed after the test. And if you don't take the time to analyze those data, then you're not going to be able to learn and understand what the problems are and what the corrections should be and what you want to pursue in the next test and what you want to put into your development program to improve the performance of the system.

Moreover, it takes many months to plan these tests. This first operational test that we did, which didn't involve the ground-based missile defense system but did involve THAAD and Aegis, was a tremendous, tremendously complex thing to plan. Then also Vice Admiral Syring's team had to deal with a lot of unanticipated events along the way, including problems with targets that had to be corrected in real time, and that's why the test got pushed out and why we didn't get all the information we hoped, but we still got a lot.

So it's not just a matter of buying additional interceptors and buying additional targets. You would think it might be that simple: Well, you know, instead of buying one additional GBI a year and one additional target a year, we'll buy more, that will enable us to test more. Certainly that's necessary, but you also have to have a lot of engineering expertise in house. A lot of this work can't be done in parallel.

You'd have to have larger teams of experts if you wanted to plan two tests simultaneously or three and execute two or three tests simultaneously instead of three. Then you would run into the infra-

structure problems. You know, there's only one Reagan Test Site, there's only one PMRF. There's only so much activity you can jam into them.

So could additional funding help increase the pace of testing for GMD or these other systems somewhat? Yes. But I think there's a limit. I can't state precisely what it is. And I also know that it wouldn't happen overnight. It would take a number of years to build up the additional engineering teams, the additional hardware in the loop facilities that have to be used to prepare for the tests.

So I can only go back to the historical record on GMD and these other tests, and the historical record is what I said. It's about 1.2 intercepts a year, even though various directors have tried to do more and, unfortunately, didn't succeed.

Senator UDALL. Thank you. I'd make two short comments, then I'll turn to Senator Sessions before we adjourn the hearing.

I think the average American family has 1.8 children, is that not right? So maybe there's some parallel here.

Mr. GILMORE. I won't speculate on that.

Senator UDALL. General Clapper was asked—by the way, for the record I wanted this, the comments that he made about the Iranian capability. I think he said the Iranians are moving to develop an ICBM. He said adding a weapon to that ICBM is a whole other problem. He implied that there would be additional time to weaponize that missile. But that doesn't mean we can rest easy, of course, and that's the mission you all are on.

I just want to thank you for your work, for your commitment to our country and our country's defense. And let me recognize Senator Sessions.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator SESSIONS. Well, thank you. I just wanted to take one moment before we adjourn to express my sympathy to the family of Dr. Schlesinger, who passed away March 27th. What a national treasure he's been. He's given of himself to the country so much and was with Dr. Perry, former Secretary Perry, who was chairman, and he was vice chairman, of the American Strategic Posture Report in 2009, which I offered legislation to call for. They really produced a report. It was a bipartisan report, a bipartisan commission, that gave us, I think, the right advice on the strategic posture of the United States. We will make a mistake if we get far away from that in my opinion.

He in 1974 was—I guess was given credit for what came to be known as the Schlesinger shift when he was with Nixon, to move away from mutually assured destruction as the policy of the United States. Then he was Secretary of Energy under President Carter and just continued to be a source of wisdom on matters of technical and nuclear issues.

So I just wanted to share—this subcommittee has benefited from hours of his time that he's given when he could have been doing other things, and he was very valuable in helping us maintain a bipartisan strategic posture.

Senator UDALL. Thank you for that, Senator Sessions. I'd like to associate myself and the committee with what you just shared with us. We'd do well to emulate Dr. Schlesinger's role.

Thank you all. We'll keep the record open through the end of the week. As you know, we may want to direct some additional questions to you. You may want to amplify or add to your statements. Thanks again for taking the time to be here.

The committee is adjourned.

[Whereupon, at 4:03 p.m., the subcommittee adjourned.]