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Before the

Subcommittee on Strategic Forces

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

BALLISTIC MISSILE DEFENSE POLICIES AND PROGRAMS

Thursday, March 22, 2018

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BALLISTIC MISSILE DEFENSE POLICIES AND PROGRAMS

Thursday, March 22, 2018

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

The subcommittee met, pursuant to notice, at 2:35 p.m. in Room SR-232A, Russell Senate Office Building, Hon. Deb Fischer presiding.

Members Present: Senators Fischer[presiding], Cotton, Sullivan, and Donnelly.

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

3 Senator Fischer: The hearing will come to order.

4 The Strategic Forces Subcommittee meets today to review
5 the Administration's Fiscal Year 2019 budget request for
6 missile defense spending, and to discuss related policies
7 with our witnesses.

8 This is an incredibly important and timely discussion
9 given the increasing missile threats facing our nation.
10 Over the past year, we have witnessed dangerous advances in
11 North Korea's ballistic missile capabilities. Kim Jong Un
12 conducted a record number of ballistic missile tests,
13 including tests of two new systems that appear to have a
14 range sufficient to hold the United States at risk.

15 The Administration has responded to this growing
16 threat. In September, the Department of Defense submitted a
17 request to reprogram about \$400 million in Fiscal Year 2017
18 funds towards urgent missile defense requirements.
19 Additionally, in November the Administration amended its
20 Fiscal Year 2018 budget request to include almost \$4 billion
21 in additional funds for missile defense and defeat
22 activities, including the expansion of our Ground-based
23 Midcourse Defense system by an additional 20 interceptors by
24 2023. This robust support for missile defense continues in
25 the Fiscal Year 2019 request, which includes almost a 25

1 percent increase in the Missile Defense Agency's budget.

2 While I strongly support these increases, it is this
3 subcommittee's responsibility to ensure they meet the war-
4 fighter's needs today and invest in advanced technology to
5 stay ahead of tomorrow's threats. Furthermore, while North
6 Korea ballistic missiles remain the principal threat against
7 which our homeland missile defenses are arrayed, it
8 represents only a portion of the broader missile threat. A
9 report released last year by the National Air and Space
10 Intelligence Center noted that Russia retains the largest
11 force of strategic ballistic missiles, while China has the
12 most active and diverse ballistic missile development
13 program in the world, and both nations continue to invest in
14 hypersonic and Cruise missiles designed to strike forward-
15 deployed U.S. forces and in some cases the homeland.

16 Testifying on these issues before us today is a
17 distinguished panel. We have John Rood, Undersecretary of
18 Defense For Policy; and General Lori Robinson, Commander of
19 U.S. Northern Command and NORAD.

20 General Robinson, as this is likely the last time we
21 will hear from you in anticipation of your retirement, I
22 also want to thank you for your 36 years of distinguished
23 service to this country. Thank you, ma'am. I think I speak
24 for all of us when I say it has been a pleasure to work with
25 you, and we wish you the best of luck.

1 We are also joined by Lieutenant General Sam Greaves,
2 Director of the Missile Defense Agency; and Lieutenant
3 General James Dickinson, who holds the title of Commanding
4 General, United States Army Space and Missile Defense
5 Command, among many others.

6 Thank you all for being with us today. We look forward
7 to your comments.

8 And I would now like to recognize our Ranking Member,
9 Senator Donnelly, for any opening remarks he would like to
10 make.

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1 STATEMENT OF HON. JOE DONNELLY, U.S. SENATOR FROM
2 INDIANA

3 Senator Donnelly: Thank you, Madam Chair.

4 I would like to thank all the witnesses; and, General
5 Robinson, congratulations. Thank you for all your service
6 to our country, for all the amazing things you have done for
7 our nation to make it stronger.

8 I want to thank Senator Fischer for holding this
9 hearing.

10 Let me also thank today's witnesses for testifying. We
11 very much appreciate your time and the work you do every day
12 in the service of our nation.

13 Protecting our country, our forward-deployed troops,
14 and our allies around the world is of the utmost importance,
15 and the threats have not stood still since this subcommittee
16 last met on this subject.

17 For just one example, as General Greaves and I
18 discussed yesterday, North Korea has made rapid progress on
19 its intercontinental ballistic missile capability. As we
20 await the release of the Missile Defense Review, it's
21 important we take this opportunity to review the Fiscal Year
22 2019 budget request to ensure it provides sufficient
23 resources to continue the work of getting our missile
24 defense systems to perform reliably and effectively.

25 We also need to continue improving our sensor and

1 discrimination capabilities so we have a better picture of
2 the threats, and we need to continue to conduct smart
3 simulation and testing before we commit to buying new
4 technologies.

5 While we continue to improve the homeland defense
6 systems, we should not take our eyes off the ball when it
7 comes to protecting our deployed troops and reassuring our
8 allies and partners. The demand from our combatant
9 commanders for Aegis, THAAD, and Patriot batteries remains
10 high. We need to consider how we can best allocate these
11 systems and effectively train the war fighters who will
12 operate them to provide the protection that is needed in
13 today's demanding environment.

14 Again, thank you for coming today. We look forward to
15 the dialogue and to your testimony.

16 Thank you, Madam Chair.

17 Senator Fischer: Thank you, Senator Donnelly.

18 Secretary Rood, I'd like to welcome you. If you would
19 like to make comments to the committee?

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1 STATEMENT OF HON. JOHN C. ROOD, UNDER SECRETARY OF
2 DEFENSE FOR POLICY, DEPARTMENT OF DEFENSE

3 Mr. Rood: Thank you, Madam Chairwoman, Ranking Member
4 Donnelly, distinguished members of the committee. Thank you
5 for the opportunity to testify today on behalf of the
6 Administration's Fiscal Year 2019 budget request.

7 With regard to the security environment, today the
8 United States faces an increasingly complex security
9 environment in which the central challenge to our prosperity
10 and security is the reemergence of long-term strategic
11 competition driven by revisionist powers in China and
12 Russia. Although they pose separate challenges with unique
13 attributes, both China and Russia seek to reshape the world
14 order and change territorial borders. Consequently, they
15 pose increasing security threats to the United States, and
16 our allies and partners.

17 Long-term competition with China and Russia requires
18 increased U.S. and allied and partner military investment
19 because of the magnitude of the threats they pose today, and
20 the potential that such threats will increase in the future.
21 We also must simultaneously strengthen our efforts to deter
22 and counter the clear and present danger posed by rogue
23 regimes such as North Korea and Iran.

24 The U.S. military remains the strongest in the world.
25 However, our advantages are eroding as potential adversaries

1 modernize and build up their conventional and nuclear
2 forces. In particular, they are fielding a broad and
3 expanding arsenal of new and more advanced missiles capable
4 of threatening the U.S., our forces abroad, and our allies
5 and partners.

6 Although this picture is unsettling and not what we
7 desire, as Secretary of Defense Mattis has pointed out, and
8 I quote, "We must look reality in the eye and see the world
9 as it is, not as we wish it to be."

10 The Administration has heeded this admonition in recent
11 strategic reviews, in the National Security Strategy, the
12 National Defense Strategy, as well as the Nuclear Posture
13 Review. They reflect a consistent and pragmatic assessment
14 of the threats and uncertainties we face in the future
15 security environment.

16 Our task at DOD is to ensure that U.S. military
17 advantages endure and, in combination with other elements of
18 national power, that we are fully able to meet the
19 increasing challenges to our national security.

20 With this as the strategic context, let me turn to a
21 discussion of the Fiscal Year 2019 budget request for
22 missile defense and the policies, programs, and capabilities
23 it supports. The Department's budget request supports the
24 President's direction set out in the National Security
25 Strategy to deploy a layered missile defense system to

1 protect the American homeland from North Korean and Iranian
2 missile threats. The request also supports regional missile
3 defenses to protect our deployed forces, allies, and
4 partners. Our missile defense system not only protects the
5 United States, it strengthens the deterrence of war and the
6 assurance of allies and partners.

7 Today the GMD, or Ground-based Midcourse Defense
8 system, provides protection for the nation. General Greaves
9 and others will discuss some of its attributes. But as
10 noted by you, Senator Fischer, in September of last year,
11 DOD requested the reprogramming of 2017 funding of more than
12 \$400 million to counter the North Korean missile threat. We
13 appreciate the support that we received from Congress for
14 this request.

15 A portion of these funds supports the important
16 homeland defense activities, including initiating work on
17 the procurement of 20 additional ground-based interceptors
18 in Alaska as early as 2023, which will bring the total to 64
19 fielded interceptors. This reprogramming also funded a
20 service life extension to the COBRA DANE radar in Alaska,
21 and software upgrades to the Sea-Based X-band radar, which
22 are both essential elements of our homeland defense. Last
23 November, the President submitted an amendment to the Fiscal
24 Year 2018 budget request for \$4 billion of additional
25 funding for missile defense, which includes construction of

1 a new missile field at Fort Greely, Alaska, and additional
2 procurement funding necessary for the 20 GBIs.

3 The Fiscal Year 2019 budget request includes \$9.9
4 billion for the Missile Defense Agency and \$3 billion for
5 air and missile defense programs in the services. This
6 budget funds a more capable ground-based interceptor with
7 the Redesigned Kill Vehicle; the deployment of new missile
8 tracking and discrimination sensors in Alaska, Hawaii, and
9 the Pacific region; and a new space-based kill assessment
10 capability. These near-term investments will enable us to
11 obtain substantially more performance and efficiency out of
12 the GMD systems necessary to meet the evolving threat.

13 We are also moving forward to bolster homeland defenses
14 against air and Cruise missile threats. In 2018, we will
15 complete the first part of a two-phase effort to provide
16 effective surveillance against missile threats to the
17 National Capital Region. Doing so will enhance our ability
18 to detect, track, and investigate suspicious aircraft, as
19 well as Cruise missiles and, when necessary, cue our missile
20 defense systems against the full spectrum of air threats.
21 We are on track to begin the second phase of this effort in
22 Fiscal Year 2019. We are also looking into technologies and
23 concepts that could be used to provide scalable and
24 deployable options for expanding this capability.

25 The Department's Fiscal Year 2019 budget request also

1 continues deployment of regional missile defenses tailored
2 to meet missile threats to U.S. forces abroad and allies and
3 partners in Europe, the Middle East, and the Indo-Pacific
4 region. The budget enhances our regional missile defense
5 capacity through additional Patriot missiles as well as
6 THAAD, SM-3 Block IB, and SM-3 Block IIA interceptors. Our
7 focus is on developing and fielding capabilities that are
8 mobile and re-locatable, which allows us flexibility to
9 respond to a crisis or conflict wherever it emerges.

10 We are also encouraging our allies and partners in
11 Europe, the Middle East, and in Asia to acquire MD
12 capabilities and strengthen missile defense cooperation in
13 order to move towards a more interoperable and integrated
14 missile defense architecture.

15 Looking forward, it's clear potential adversaries are
16 modernizing and expanding their missile capabilities. We
17 must ensure that our missile defense investment and strategy
18 enable us to meet the most dangerous missile threats today,
19 while enabling us to counter future missile threats as they
20 expand. Areas for work on advanced technology include
21 improved discrimination in our sensor architecture, lasers
22 to intercept offensive missiles during their most vulnerable
23 boost phase of flight, evaluating space-based sensor
24 concepts, and the multi-object kill vehicle.

25 Let me conclude by saying that in an increasingly

1 complex and threatening security environment, DOD must
2 sustain the capabilities needed to deter and defend against
3 attacks on our homeland, U.S. forces deployed abroad, allies
4 and partners. We must make the investments needed to
5 address the ongoing erosion of our operational advantages
6 and remain the preeminent military power in the world.

7 Thank you again for the opportunity to testify. I look
8 forward to your questions.

9 [The prepared statement of Mr. Rood follows:]

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1 Senator Fischer: Thank you, Mr. Secretary.
2 Your full statements will be included in the record.
3 General Robinson?
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1 STATEMENT OF GENERAL LORI J. ROBINSON, USAF,
2 COMMANDER, UNITED STATES NORTHERN COMMAND AND COMMANDER,
3 NORTH AMERICAN AEROSPACE DEFENSE COMMAND

4 General Robinson: Ma'am, first of all, thank you very
5 much. I am certainly honored to be sitting here and
6 testifying with this committee, especially along with my
7 brothers. It's an honor for me.

8 What has been mentioned is the strategic environment
9 and threats facing our nation continue to evolve, as you
10 have both mentioned. Our adversaries are taking deliberate
11 steps to extend their operational reach and are developing
12 new capabilities to range targets in North America, in the
13 United States and Canada.

14 At U.S. Northern Command and NORAD, we understand the
15 urgency of keeping pace with these evolving threats. We
16 also recognize that North Korea represents the most
17 immediate threat to our homeland and therefore remains
18 NORTHCOM's highest priority.

19 I'm confident that the Ground-based Midcourse Defense
20 system can defeat the threat today, and I've testified in
21 front of every committee and have said so, and I remain
22 confident. And I strongly support the continued
23 improvements to the ballistic missile defense enterprise in
24 order to maintain our advantage. We continue to work with
25 the Missile Defense Agency, the intelligence community, and

1 other combatant commands as part of our collaborative effort
2 to out-pace the threat.

3 I'm grateful, quite frankly, for the committee's
4 approval of the Fiscal Year 2017 above-threshold
5 reprogramming and support the budget amendment, and this
6 will increase the systems capability and capacity.

7 Under my NORAD responsibility, advanced Cruise missiles
8 with a low-rate arc cross-section represent a challenge to
9 our air defense systems. Russia continues to modernize its
10 delivery systems, long-range bombers, and strategic
11 submarines capable of launching from distances not
12 previously seen, reducing the indication and warnings we are
13 likely to receive from a combat launch. To defend against
14 these advanced Cruise missiles, we must make prudent
15 investments, as you both have talked about, and we
16 appreciate in advance sensors and defensive weapon systems
17 to protect our nation's vital assets.

18 The men, the women, the warriors of U.S. Northern
19 Command and NORAD stand united in a common purpose, ready to
20 face the threats to the United States and Canada today, and
21 we are evolving to face the threats of tomorrow. Ladies and
22 gentlemen, you need to know, we have the watch.

23 Ma'am, sir, as you both have indicated, I'm getting to
24 have the privilege to retire. I have to tell you both that
25 after 36 years of serving my nation, and after these last

1 two years of having this sacred responsibility of defending
2 our nation, I want you both to know, I want all of you to
3 understand my gratitude and my heartfelt appreciation for
4 what you do to support NORAD and U.S. Northern Command every
5 day to our nation's Armed Forces -- soldiers, sailors,
6 airmen, Marines, civilians, and in my NORAD hat, the
7 Canadians. What you do each and every day -- you know,
8 people say to me, hey, thank you for what you do, but I know
9 I can't do what I do if you don't do what you and your back-
10 benchers do each and every day.

11 So, thank you very much. I welcome your questions.

12 [Applause.]

13 [The prepared statement of General Robinson follows:]

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1 Senator Fischer: Thank you, General.

2 General Greaves?

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1 STATEMENT OF LIEUTENANT GENERAL SAMUEL A. GREAVES,
2 USAF, DIRECTOR, MISSILE DEFENSE AGENCY, DEPARTMENT OF
3 DEFENSE

4 General Greaves: Chairman Fischer, Ranking Member
5 Donnelly, distinguished members of the subcommittee, thank
6 you for this opportunity to testify on the Missile Defense
7 Agency's budget request for Fiscal Year 2019.

8 I would first like to express our appreciation to this
9 committee for its support of the Department's above-
10 threshold reprogramming request in September 2017, and the
11 Fiscal Year 2018 budget amendment which provided
12 reprogramming approval and emergency funding to enhance the
13 nation's missile defeat and defense capabilities.

14 I'm also pleased to report that we are executing those
15 funds with the utmost urgency.

16 I would also like to take a second to thank the
17 thousands of men and women across government and industry
18 who work tirelessly every single day across the globe in
19 support of our nation's ballistic missile defense system.
20 They remain our asymmetric advantage.

21 Over the past year we have been given a clear and
22 unambiguous message from the President that we are committed
23 to expanding and improving a state-of-the-art missile
24 defense system. So in my mind, the time for delays and more
25 studies and more objections is over. As I say it, the

1 threat has voted and continues to visibly vote through a
2 demonstration of capabilities.

3 Last summer I laid out three Missile Defense Agency
4 priorities to help guide our actions, our behavior, and
5 program planning. First, we will continue to focus on
6 increasing the system reliability to build more fighter
7 confidence. Second, we will increase engagement capability
8 and capacity. And third, we will address the advance
9 threat.

10 I can tell you that the current ballistic missile
11 defense system meets today's threat. However, as the threat
12 increases in both number and lethality, we need to ensure
13 that our systems will remain reliable, remain secure from
14 cyber security threats, and that the nation's ballistic
15 missile defense capability and capacity keep pace with that
16 threat.

17 We currently have 44 emplaced ground-based interceptors
18 for homeland defense. We plan to expand the fleet to 64 by
19 2023. In addition, improvements in sensor coverage to
20 include the long-range discriminating radar in Alaska, the
21 addition of a homeland defense radar in Hawaii, if it is
22 approved, and planning for a homeland defense radar in the
23 Pacific, as well as advanced discrimination improvements
24 will enable the United States to improve protection of the
25 homeland.

1 The agency will also continue its Redesign Kill Vehicle
2 development efforts, enhance the stockpile reliability
3 program, and expand the ground-based interceptor battle
4 space.

5 Integrated space and terrestrial sensors for cueing,
6 tracking, discrimination, and targeting ballistic missile
7 threats are critical to improving missile defense
8 architecture robustness. This budget will continue to fund
9 the space-based kill assessment demonstration program to
10 deliver a capability to confirm intercepts for improved
11 defense of the homeland.

12 We are also continuing concept definition studies for
13 space-based missile defense tracking sensors. And if
14 pursued, space sensors will be able to detect and track
15 traditional and emerging threats as part of the BMBS
16 architecture.

17 We will continue to install the Aegis ballistic missile
18 defense weapon system on Aegis ships and deliver Standard
19 Missile-3 Block Ib interceptors. We're also supporting the
20 European phase adaptive approach, providing coverage and
21 protection of NATO European territory populations and our
22 deployed forces against the increasing ballistic missile
23 threat from the Middle East.

24 Our request will support continued integration of the
25 SM-3 Block IIA missile, a co-development effort with Japan

1 into the Aegis ballistic missile defense weapon system, and
2 the pre-production of all up-rounds to support the initial
3 deployment for EPAA Phase 3.

4 Currently, there is an operational Aegis to shore site
5 located in Romania, and while we have experienced delays in
6 the military construction portion of the Aegis to shore
7 effort in Poland, we remain steadfastly committed to
8 delivery of that capability in support of EPAA Phase 3.

9 Finally, this budget request will continue the
10 exploration of breakthrough technologies for integration
11 into the BMBS, including discrimination improvements, multi-
12 object kill vehicle technology, hypersonic defense
13 technology, space-based interceptor technology, and
14 exploring higher-power lasers and interceptors that have
15 potential use against threat missiles in a boost phase of
16 flight.

17 As we evaluate the elements of the missile defense
18 system, we will actively pursue developing elements that
19 have multi-mission and department-wide utility and leverage
20 those systems once such activity with the F-35 that may have
21 residual capability for missile defense.

22 Madam Chairman and members of the subcommittee, I look
23 forward to answering your questions. Thank you.

24 [The prepared statement of General Greaves follows:]

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1 Senator Fischer: Thank you, General.
2 General Dickinson?
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1 STATEMENT OF LIEUTENANT GENERAL JAMES H. DICKINSON,
2 USA, COMMANDING GENERAL, UNITED STATES ARMY SPACE AND
3 MISSILE DEFENSE COMMAND/ARMY FORCES STRATEGIC COMMAND AND
4 JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE
5 DEFENSE

6 General Dickinson: Chairman Fischer, Ranking Member
7 Donnelly, and other distinguished members of the
8 subcommittee, thank you for your continued support of our
9 soldiers, civilians, and their families. I'm honored today
10 to testify before you to emphasize the importance of air and
11 missile defense to our nation, deployed forces, allies and
12 partners.

13 Air and missile defense threats continue to increase
14 both in quantity and offensive capability. With this in
15 mind, I appreciate your continued support for the nation's
16 air and missile defense forces as we fulfill our role in
17 securing the nation today and developing future forces and
18 capabilities to counter tomorrow's threats.

19 I'd like to briefly summarize the missions of the
20 organizations I command.

21 First, United States Army Space and Missile Defense
22 Command, Army Forces Strategic Command, SMDC/ARSTRAT, serves
23 as a force provider in support of our combatant commanders.
24 Our six priorities are to protect our homeland; provide
25 combat-ready forces and capabilities; plan and conduct

1 synchronized global operations; prepare or adapt leap-ahead
2 concepts and technologies; preserve and account for the
3 nation's critical resources; and promote and foster a
4 positive command climate.

5 We provide not only air and missile defense forces but
6 also Army space forces. The Army has more than 4,000
7 military and civilian space cadre providing continuous
8 space-based capabilities and support to the warfighter
9 around the world, from satellite communications to missile
10 warning. SMDC/ARSTRAT's future warfare center and technical
11 center develop space and missile defense concepts,
12 requirements, and doctrine. We provide training to the Army
13 space cadre and missile defense operators, and execute space
14 and missile defense research and development.

15 Within SMDC/ARSTRAT, we are collaborating closely with
16 the Army's air and missile defense cross-functional team.
17 This effort is key to rapidly developing requirements and
18 ensuring these future capabilities transition quickly from
19 concept to prototyping to fielding. We are focusing on
20 capabilities that include mobile short-range air defense and
21 directed energy.

22 I also have the honor and the privilege to command the
23 Joint Functional Component Command for Integrated Missile
24 Defense, or JFCCIMD, which supports United States Strategic
25 Command by integrating and synchronizing global missile

1 defense operations.

2 In support of USSTRATCOM, JFCCIMD executes these five
3 essential mission defense tasks: synchronizing operational-
4 level planning; supporting ongoing operations; integrating
5 training exercises and test activities globally; providing
6 recommendations on the allocation of low-density, high-
7 demand missile defense resources; and also advocating for
8 future capabilities.

9 To accomplish this, we maintain close collaborative
10 relationships with the geographic combatant commands, the
11 Missile Defense Agency, the Office of the Secretary of
12 Defense, the Joint Staff, and our allies and partners.

13 Lastly, it's important to highlight that the challenges
14 that we face cannot be overcome without the dedication of
15 our most precious asset, our people. The service members,
16 civilians and contractors, along with their families,
17 stationed at home and globally deployed, provide support to
18 the Army and joint warfighter each and every day. We are
19 committed to providing trained and ready soldiers and
20 civilians and developing effective space and missile defense
21 capabilities to counter the threats of today and tomorrow.

22 I appreciate the committee's continued support of
23 missile defense operations, and especially your support of
24 the men and women who deploy, develop, and operate these
25 complicated systems. I have addressed in detail the full

1 range of these missions and how we are executing them today
2 in my written statement which, as you said, will be
3 submitted for the record. I look forward to addressing your
4 questions. Thank you.

5 [The prepared statement of General Dickinson follows:]

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1 Senator Fischer: Thank you all very much.

2 We'll begin our first round of questions.

3 General Robinson and General Greaves, you both have
4 talked about the defense capabilities that we have currently
5 with the most pressing threat that we have, and that's North
6 Korea. But in your opinion, does this budget keep us on a
7 path to stay ahead of the threat that's posed by North
8 Korea?

9 General Robinson: So, ma'am, I'll talk first, and then
10 I'll let General Greaves, since he is the smart one.

11 Here's what I worry about. As I paid attention, we
12 appreciate the ATR that was given to us last fall. It
13 allows us to build capacity.

14 You and I chatted a couple of times. The fact is when
15 we looked at what KJU was doing last May versus what
16 happened through the summertime, this capacity and this
17 Redesigned Kill Vehicle will be very good for us in Alaska.
18 But at the same time, we're not taking our eye off of having
19 a better discriminating radar.

20 So I would tell you that where we are and what we're
21 doing right now keeps us ahead of what's happening. We just
22 can't take our eye off the ball.

23 And I'll turn it over to General Greaves.

24 General Greaves: Chairman Fischer, the answer is yes.
25 As I mentioned, the current ballistic missile defense system

1 can meet today's threat, and both the Fiscal Year 2017 ATR,
2 the Fiscal Year 2018 budget amendment, and this budget, what
3 it does is increase our capability or our capacity, more
4 rounds in the ground, whether it's ground-based interceptors
5 or THAADs or Aegis 3 IBs, or ultimately the IIAs. So I
6 believe we are perfectly positioned to defend against
7 today's threat.

8 The other thing the budget does, it helps us keep our
9 eye on the advancing threat as North Korea in particular and
10 Iran, as they both increase their capability, both in
11 numbers and lethality. We must ensure that we look ahead at
12 what capability will be required to stay apace of that
13 threat.

14 In the area of space sensors or deploying the
15 terrestrial architecture to space to supplement and augment
16 what is on the ground, keeping track of that capability is
17 quite essential.

18 Thank you.

19 Senator Fischer: And U.S. Force Korea, you've
20 submitted that request. Can you talk a little bit about the
21 request and the importance of receiving funding this year?
22 You outlined it a little bit, but what is the priority for
23 it this year?

24 General Greaves: It's a very high priority. In fact,
25 it was sensitized to me during my last visit to Korea with

1 General Brooks. We spent over an hour about two to three
2 feet away, and he impressed upon me the importance of what's
3 in that GEON. What it does, a couple of things. One, it
4 allows us to disconnect the fiber tie between the THAAD
5 control center and its launchers to increase the battle
6 space by moving the launchers out. It allows the Patriot
7 capability to essentially use the power of the THAAD radar
8 to expand its battle space. And then it does what I believe
9 is extremely important, integrates THAAD and Patriot to
10 essentially optimize use of the interceptor so you minimize
11 or eliminate wastage. So for General Brooks being right
12 there on the front line, that was extremely important to him
13 to ensure that we expand the battle space and optimize use
14 of those precious assets.

15 Senator Fischer: And usually items on the UFER list
16 are there because they were judged to be of lower priority
17 than the items that are included in the basic budget
18 request. As I understand it, however, this funding appears
19 on the UFER list as a result of timing. Is that correct?

20 General Greaves: That's correct. The items you see on
21 the --

22 Senator Fischer: It's not a reflection of the
23 priority, then, in this case?

24 General Greaves: Not in my mind.

25 Senator Fischer: It was all due to timing.

1 General Greaves: Yes, ma'am.

2 Senator Fischer: Okay. And, Secretary Rood, when do
3 you expect to complete the MDR?

4 Mr. Rood: We're in the process of doing that work now
5 as we speak, Senator, and we're looking in the near term
6 here, in the spring, to finish that review. There are a
7 number that you highlighted in your statement, some of the
8 challenges in the threat environment that we face, so we're
9 eager to stay ahead of that threat, and we're looking at
10 some competing approaches to do that. But I expect we'll
11 have that shortly to you.

12 Senator Fischer: General Hyten noted some difficult
13 policy questions in there, and we heard that boost phase
14 term on an opening statement, that that's a big challenge.
15 Is the Department formulating policies to fill that gap so
16 that you can address those challenges that are associated
17 with the boost phase intercept as part of the MDR?

18 Mr. Rood: Yes. We're looking at boost phase defense.
19 As mentioned, this is a period during the missile's flight
20 when it is vulnerable to attack. It's a challenging period
21 to be able to execute an effective missile defense during
22 that period due to the geographic constraints and other
23 things, but we are looking at a variety of ways to try to
24 accomplish that goal.

25 Senator Fischer: Including lasers?

1 Mr. Rood: Yes.

2 Senator Fischer: Thank you.

3 Senator Donnelly?

4 Senator Donnelly: Thank you, Madam Chair.

5 I want to thank all of the witnesses again for being
6 here.

7 Undersecretary Rood, can you tell me how and why the
8 review changed from the ballistic missile defense review to
9 the missile defense review?

10 Mr. Rood: In terms of the rationale, Senator, the
11 ballistic missile defense review was looking, of course, at
12 ballistic missile defense, defense of missiles that fly over
13 a ballistic trajectory. The thought process was that there
14 are other forms of missile attack, Cruise missile attack,
15 hypersonic glide vehicles and the like that were of a
16 similar nature, and their challenge in the integrated air
17 and missile defense systems that the services are pursuing
18 to provide defense for our troops in the field, our allies
19 and things of that nature, that it was important to see a
20 connection there, and that was the rationale. Of course, it
21 predated my arrival at the Department to do that, but I
22 support that decision because of the integrated security
23 challenge that we face with those threats.

24 Senator Donnelly: General Greaves, can you tell us how
25 you contributed input into the missile defense review?

1 General Greaves: Yes, sir. We have key members of our
2 staff from the engineering directorate, from our command and
3 control battle management directorate, from other parts of
4 the organization that have met frequently with other members
5 within the Department to help construct the MDR. So we've
6 been actively involved.

7 Senator Donnelly: General Robinson, can you please
8 tell us how you helped contribute input into the missile
9 defense review process?

10 General Robinson: Absolutely. I think what's
11 important as the warfighter and the one defending the United
12 States, I've been able to contribute saying that I need to
13 be able to detect, identify, track, and when necessary
14 engage to defend the United States. So whether it's
15 ballistic missiles, whether it's Cruise missiles, I've been
16 able to give as the battle space owner my opinion and
17 support my brothers here at the table.

18 Senator Donnelly: General Dickinson, same question.

19 General Dickinson: Yes. We've contributed in a large
20 part to the effort in terms of JFCCIMD or the role that I
21 play as the integrated missile defense element for U.S.
22 Strategic Command. So we've been participating throughout
23 the process, and what we bring to the process is we bring
24 the representation of all the combatant commands along with
25 NORTHCOM in terms of providing that expertise and that

1 perspective as we help to develop and shape the document.

2 Senator Donnelly: General Greaves, I understand you're
3 trying to accelerate the development and fielding of the
4 Redesigned Kill Vehicle to address the growing threat, and
5 what I would like to know is can you describe for us the
6 ways you're mitigating the risk in the program and ensuring
7 we have a capability that is fully tested before it is
8 deployed?

9 General Greaves: Yes, sir. This development will be a
10 gated, milestone-driven acquisition in specific decision
11 points along the way where the Department, not only the
12 Missile Defense Agency, will assess readiness to proceed to
13 the next phase. As an example, we completed the preliminary
14 design review last May and used that as a decision point to
15 convince anyone from the Cape, the then ATNL, Ms. Lord, and
16 others within the building that we were ready to proceed
17 with obligating I think it was \$56 million worth of advanced
18 procurement.

19 So what we have done is we have taken great care and we
20 have heeded the NDAA language that addresses fly before you
21 buy, with the specific wording that talks about assessing
22 our readiness to make these decisions through either
23 adequately assessing through tests or some other method
24 before we make these production and deployment decisions.
25 So we will make decisions after, as I mentioned, the

1 preliminary design review. We have the critical design
2 review coming up in December where another subset of that
3 funding will be assessed, and we've got a decision to make
4 after the first control test vehicle test, which will now
5 include not only a fly-out of the interceptor but a target
6 where we will maneuver to the target but then maneuver away
7 after convincing ourselves that we would have engaged the
8 target, and we will use that extra capability to assess how
9 well the interceptor does in the combined or expanded battle
10 space.

11 So the bottom line story, sir, is a gated, milestone-
12 driven, thoroughly reviewed assessment along the way.

13 Senator Donnelly: Thank you.

14 Thank you, Madam Chair.

15 Senator Fischer: Thank you, Senator.

16 Senator Cotton?

17 Senator Cotton: Thank you all for appearing today for
18 your testimony.

19 General Greaves, let's talk a little bit more about
20 boost phase intercept. I will reveal that I am a major
21 proponent of this technology at the outset. The boost phase
22 missiles are big and they're hot, so easy to detect, and
23 most importantly they're over the bad guys' territory, not
24 over ours. But they don't come from just anywhere on earth.
25 There's a limited number of countries on earth that have

1 this capability, and they intend to challenge us, and that
2 boost phase intercept is at risk. Two obvious candidates
3 are Russia and China. But is it fair to say that boost
4 phase defenses are not really suitable against that threat
5 because those countries are so large and they can position
6 their missiles so far inland?

7 General Greaves: I would say so, yes. There is a
8 geographical component of it. Boost phase intercept is, if
9 not ideally, well suited to, say, the Korean Peninsula
10 where, as you say, they can't go far back.

11 Senator Cotton: Those are the magic words. So since
12 Russia and China are not really susceptible to effective
13 boost phase missile defense, where is it? North Korea.
14 Maybe Iran as well, but North Korea is where it's really
15 suitable.

16 We talked about the lasers earlier. I want to come
17 back to those in a bit.

18 What is the agency doing to explore the feasibility of
19 airborne hit to kill defenses, specifically on UAVs? What
20 kind of technology gap do we have today, given what we're
21 already capable of doing with a UAV, in air-to-ground attack
22 that might help neutralize or at least mitigate the North
23 Korea threat?

24 General Greaves: We are doing technology development.
25 That is a phase of acquisition that we're in, looking at

1 both directed energy components as well as most likely
2 taking advantage of air assets which will already be in the
3 theaters in support of other mission sets, executing by the
4 COCOM to look at those assets, either sensors that could be
5 fed into the command and control battle management system
6 within our ballistic missile defense system, or at shooters.
7 They could be platforms for a new breed of fast interceptor
8 weapons that if placed appropriately or closely or in the
9 right position would be effective boost phase intercept
10 capability.

11 Senator Cotton: I'm a big fan of manned aircraft as
12 well, but manned aircraft have men and women in them, so
13 they have limitations, right? They have to land, they have
14 to eat, they have to sleep, so on and so forth. UAVs do
15 not. How high a priority is it for the agency to explore
16 the possibility that we could put an effective airborne net
17 over the Korean Peninsula with UAVs, both sensor platforms
18 and armed platforms in international waters, that could
19 potentially prevent North Korean missiles from ever getting
20 off of the launching pad?

21 General Greaves: It is a high priority within the
22 Missile Defense Agency, and the phase that we're in now is
23 the technology piece of it. For instance, directed energy.
24 Can we get --

25 Senator Cotton: Can we get to directed energy for a

1 moment? So given what we can do with a UAV and air-to-
2 ground attack right now, what is the gap of taking that kind
3 of demonstrated and deployed technology and deploying it in
4 that kind of system against North Korea? And rather than
5 aiming it at a terrorist's home or car, aiming it at a North
6 Korea missile on the launch pad?

7 General Greaves: The full answer will have to be
8 coordinated with the combatant commander. But the gap or
9 limitation is numbers and altitude and duration for the
10 platforms of interest, and we have been doing some
11 preliminary work on that over the past few years. And
12 again, we're not talking directed energy, but doing things
13 such as beam pointing, stability, duration, and pseudo con
14 ops development on it. But the actual placement above,
15 around, in the vicinity of the targets, that's a COCOM
16 decision.

17 Senator Cotton: Okay. I just think it's an extremely
18 high priority, and most people probably underestimate how
19 close we are to that kind of solution. I know that's not
20 the long-term solution. That's why I want to put directed
21 energy or lasers to the end of the conversation. I know
22 that's a little bit longer, but that's ultimately the right
23 solution, I think. Once lasers get shrunken down so the
24 power source can actually fit on an aircraft like that, then
25 I strongly support that as well. But I think that we have a

1 real opportunity in the very short term, not a matter of
2 months but not a matter of decades either, to if not
3 neutralize the North Korean threat with airborne boost phase
4 systems, at least severely mitigate it.

5 Thank you.

6 Senator Fischer: Thank you, Senator.

7 Senator Sullivan?

8 Senator Sullivan: Thank you, Madam Chair.

9 Just to follow up on Senator Cotton's questioning,
10 General Greaves, is the technology available right now to do
11 that?

12 General Greaves: Sir, I'd say portions of the
13 technology are available. For instance, the current suite
14 of kinetic weapons that we have that could potentially
15 fulfill that role, they may not have the distance, the legs
16 as we call it, to execute even if we had the UAV technology
17 flying and ready to go. The concept of operations is
18 extremely important with respect to how many caps are
19 flying, where those caps are located, the resources tail
20 that goes behind it. But those are not my areas of
21 responsibility. That's the COCOM. But the technology is
22 getting closer.

23 Senator Sullivan: Okay. Good. That's good to know.

24 General Robinson, thank you. I missed your opening
25 statement, but I understand you had an announcement, which

1 we're kind of shocked and, wow, you've been an historic
2 figure. I want to thank you for your service, the first
3 female combatant commander in the history of the United
4 States. Thanks for coming up to Alaska so much, we
5 appreciate that. Recently at the event that we both were
6 at, it was a great evening, so thank you. Thank you for
7 your wonderful service.

8 I wanted to talk a little bit, I mentioned to a number
9 of you, General Greaves as well -- so we made good progress
10 in the last year, I think, with regard to a missile defense
11 bill from this committee, passes in the NDA, fully funded in
12 December. I was out on a code led by the current chairman,
13 acting chairman of the Armed Services, Senator Inhofe. We
14 were in Alaska. We went out to Fort Greeley. Part of the
15 funding and the new authorization is for a new field out
16 there, a lot of excitement. We're on the ground looking at
17 it. And then we hear five to six years, five to six years,
18 before we get this field operational.

19 Now, we won World War II in a shorter amount of time.
20 I can go through a whole list, and the Chair is very focused
21 on these issues, not just in the military but building
22 roads, whatever.

23 Why on earth should this take five to six years? And
24 what do you need -- I've already talked to a number of you
25 -- legislatively, because I'm sure it would be bipartisan,

1 to say, hey, the threat is here, the threat is here right
2 now, we need more capacity. A new field at Fort Greeley is
3 more capacity.

4 What can we do to help you make this so it's not five
5 to six years, a half a decade, to get a new field
6 operational? We should try to get that done in a year and a
7 half, in a year.

8 So, General Greaves, I know I just pitched this to you
9 the other day, but we want to get this in the NDAA to help
10 you, to help America defend itself when there's enormous
11 bipartisan support to do it. Five to six years, to me, is
12 lunacy. What can we do?

13 And I'll throw this out to any of the witnesses.

14 General Greaves: Sir, if I can start, one update to
15 our conversation yesterday, the environmental impact
16 statement for Fort Greeley was done for the 100 interceptor
17 base when the field was first developed.

18 Senator Sullivan: Right, right.

19 General Greaves: So what we have to do for the
20 additional 20 is an environmental assessment, and that work
21 is just about done.

22 Senator Sullivan: Okay. Good.

23 General Greaves: So that's off the table.

24 The construction of the missile field itself is an
25 approximately 36-month effort, and the limitations involved

1 in --

2 Senator Sullivan: They built the Alcan Highway in 11
3 months.

4 General Greaves: Yes, sir.

5 Senator Sullivan: I mean, there's a long list of
6 things in America we used to build quickly. Even three
7 years is pretty darn long, right?

8 General Greaves: Yes, sir. And those three years are
9 paced by the standard building timeframe up in Alaska, April
10 through October. Now, there are things that could be done
11 --

12 Senator Sullivan: We build year-round in Alaska on
13 occasion.

14 General Greaves: Yes, sir. I was about to say there
15 are things that can be done to essentially reduce that time,
16 but the pacing item for the additional 20 GBIs in the ground
17 are the GBIs themselves and the fact that they were being
18 procured as all-up rounds with the Redesigned Kill Vehicle
19 on top. And the approach, unlike what was done for the
20 initial deployment of the initial interceptors, where we
21 essentially have done exactly what you're asking, we are
22 taking a series of steps to ensure that what we are
23 designing, building, testing, and delivering are more
24 reliable, more maintainable, and for the long term more
25 sustainable. And the acquisition of that under the current

1 set of guidelines -- we talked about that a little earlier -
2 - is a gated and milestone-driven decision process.

3 So there are a number of folks, other entities within
4 the Department that are involved, all the way from the
5 operational testers to the folks in Cape to the folks in now
6 A&S, acquisition and sustainment, that have to be involved
7 to ensure that we are minimizing risk for this deployment.
8 Now, if it was stated that there is some national security
9 waiver to get them into the ground now and to provide the
10 Missile Defense Agency and others with complete authority to
11 do things, then we could, of course, move out faster at a
12 higher level of risk.

13 But we learned some significant lessons from the
14 deployment of the initial set of GBIs where we had to go
15 back and complete the systems engineering for those rounds,
16 and it's taken us quite a bit of time to do it, and we have
17 now completed that.

18 So the intent here is, keeping the threat in mind, we
19 already accelerated the planned deployment of those GBIs by
20 at least a year, to 2023, beginning in 2021, going out to
21 2023. But to accelerate it further brings increased risk.
22 We feel very confident we can deliver it per the timeline
23 that we got.

24 Senator Sullivan: Well, we want to work with you, all
25 of you, on accelerating that.

1 Senator Fischer: Thank you, Senator Sullivan.

2 Secretary Rood, if I could continue with another issue
3 on the missile defense enterprise, we know it struggled with
4 the increasing portion of the MDA's budget that's going to
5 procurement and taking money away from what really is the
6 MDA's chief purpose, and that's research and development,
7 and while we all support the significant increase in MDA's
8 top line that's included in this year's budget, I think it
9 actually exacerbates this issue. MDA's budget grew by
10 almost \$2 billion compared to the projections in last year's
11 budget, and about 45 percent of that increase went to
12 procurement.

13 So, do you expect the MDR to look into this issue?

14 Mr. Rood: One of the things that is a challenge facing
15 us in the Department is the Missile Defense Agency's role,
16 as you said, as a research, development, testing, and
17 evaluation organization. They've also played a substantial
18 role in operations and sustainment of systems once we have
19 them in the field. And one of the organizational issues
20 that we need to work through is the transition, at what
21 point and how do we transition those capabilities to the
22 services to manage. That's been something the Department
23 has struggled with for quite some time. For the past decade
24 and a half, that's been a discussion item.

25 So that is one of the things in the missile defense

1 review that we are looking at because we want to make sure
2 that we get the balance correct, where MDAs work on near-
3 term production -- that is to say, current systems -- and
4 the balance about new system development, advanced
5 capabilities. There's always a balance about how much do
6 you invest today and how much in future technology, and
7 getting that balance correct is one of the things we're
8 looking at.

9 Senator Fischer: I hope you are able to do that.

10 Secretary, for all of Russia's talk about how the U.S.
11 missile defenses jeopardize strategic stability and
12 justifies their violation of arms control treaties or
13 pursuit of new nuclear weapons -- President Putin's speech
14 was the latest example of that -- isn't it true that Moscow
15 deploys a highly capable ballistic missile defense system?

16 Mr. Rood: They do. The Russians have maintained and
17 indeed, at times when their budgets were most stressed, they
18 continued to modernize the Moscow anti-ballistic missile
19 defense system. I can say from the time when I previously
20 served in government, in the 2001 to 2008 period, having
21 routine discussions with the Russians about that, and
22 they're very blunt about the fact that that's a high
23 priority for them, to defend their capital and their people,
24 where the majority of their population lives, against
25 ballistic missile attack. Their basic argument is that they

1 don't wish the United States to do that.

2 So I don't accept that argument, and I would note that
3 it's a new argument from President Putin. In 2001, when the
4 United States announced its withdrawal from the ABM Treaty,
5 President Putin gave a national address in which he stated
6 this posed no threat to Russia's national security, and
7 shortly thereafter he agreed to the conclusion of the Moscow
8 Treaty, which at that time and to date is the largest
9 reduction in strategic nuclear forces that our two countries
10 have done.

11 So I read very carefully his recent statement, and we
12 weren't surprised by what was announced, certainly
13 disappointed by the tone in that statement, but it's a new
14 discussion item, it's a new characterization I think of what
15 has led to those capabilities that we're seeing from
16 President Putin.

17 Senator Fischer: Do you have any thoughts that you can
18 share with us on why you think President Putin is making
19 this new case?

20 Mr. Rood: I think it is twofold. One, the context of
21 that speech. The vast majority of it dealt with domestic
22 issues. It was a bit of a -- State of the Union speech
23 wouldn't be exactly the right description of it, but it
24 covered a whole range of topics, mostly focused on domestic
25 issues. The tail end did focus on defense capabilities and

1 those particular capabilities.

2 Senator Fischer: Was it a political speech do you
3 believe, then?

4 Mr. Rood: Yes, but it was more than that. It
5 certainly was messaging to the rest of the world and the
6 United States. So we should see it for both. And it was
7 noteworthy that President Putin showed an animation of a
8 missile strike on the United States. There is only one
9 other country that has done that, North Korea. It was also
10 noteworthy that it was not the only time or effort where the
11 Russians have signaled things to us in the United States.

12 So I think while it was a political speech, it was also
13 a message to the United States and the rest of the world
14 about how they see us and that security environment and the
15 capabilities that Russia is pursuing.

16 Senator Fischer: Thank you, Mr. Secretary.

17 Senator Donnelly?

18 Senator Donnelly: Thank you, Madam Chair.

19 General Dickinson, DOT continues to find the Army's
20 training of its soldiers to conduct testing of THAAD and
21 Patriot is insufficient. In the Fiscal Year 2017 report,
22 DOT found that flight testing in Fiscal Year 2017
23 demonstrated that THAAD training and documentation
24 deficiencies worsened in Fiscal Year 2017, and Patriot
25 training remained inadequate to prepare operators for

1 complex Patriot engagements.

2 In your role as Commander of Army Space and Missile
3 Defense Command, you have the responsibility to organize,
4 train, and equip Army space and global ballistic missile
5 defense forces. Do these insufficiencies concern you, and
6 what are we doing to improve the training?

7 General Dickinson: So, the air and missile defenders
8 in the Army in particular that I can speak for go through a
9 very rigorous training program from the time that they come
10 in to their initial assignments into their units. They go
11 through a very detailed and comprehensive training strategy
12 that's codified and developed into what we call table
13 training, very similar to what you may see in an armor unit
14 that has tables 1 through 12 that are very prescriptive and
15 descriptive in highlighting the tasks that need to be
16 completed as they move along from an individual type of
17 qualification as an individual soldier operator into a team
18 or into a crew.

19 That spans from a Patriot unit to a THAAD unit, even to
20 a GM unit, and I'm responsible for providing trained and
21 ready forces to General Robinson in the GMD world in terms
22 of the 100th and the 49th missile defense units. But I can
23 assure you that that training development and that training
24 proficiency is measured on a very frequent basis and is
25 tested frequently on the actual equipment, and we also use a

1 host of simulations in order to develop that.

2 Senator Donnelly: So, then, is the Fiscal Year 2017
3 DOT&E report wrong in its conclusions?

4 General Dickinson: I wouldn't say it was wrong. I
5 would have to look closely at the scenarios in which they
6 were evaluating those. I will tell you from my experience
7 as a commander on the ground and through the evaluations
8 that I run that the training proficiencies, particularly
9 with the GM system, are at a very high state, and I don't
10 believe DOT&E was evaluating the GM soldiers. I know they
11 were on the THAAD and Patriot.

12 General Robinson: So, Senator, if you don't mind, I
13 had the privilege to go to Fort Greeley and watch the
14 soldiers, so I know from the time that I have to give some
15 authorities that I have to the execution that happens on the
16 ground at Fort Greeley for me to be able to sit down and
17 talk to the soldiers that do this each and every day from a
18 training perspective, I was very proud to watch them, and I
19 know that this training goes on more than once a day, every
20 crew, both from my command center in Colorado Springs down
21 to the soldiers at Fort Greeley. So I just wanted to add
22 that as a warfighter.

23 Senator Donnelly: General, I have great respect for
24 them, too, and appreciate everything they do for our
25 country. So how does the report come up with that

1 conclusion?

2 General Robinson: I'd have to go back and do like
3 General Dickinson said and go see what was the scenario that
4 they looked at, to give it a little more context, because of
5 what I watched and observed myself. So I owe you my best
6 military advice if I go back and re-read what was given.

7 Mr. Rood: If I might add also, I'd have to go back, as
8 I mentioned earlier, take a look at the report and see what
9 the scenario is. If it was a test scenario, for example,
10 sometimes they will look at that during one of MDA's tests,
11 operational tests, or whether or not they were in the field
12 with the soldiers at that time. So the circumstances are
13 very important here.

14 But I can attest to the fact that at every level within
15 their training program, they are trained and certified.
16 It's a series of written evaluations, a series of hands-on
17 evaluations, and then performance-oriented evaluations
18 conducted by, many times, outside agencies. What I mean by
19 that is outside their immediate chain of command. And there
20 are passes, and there are failures, and we do that routinely
21 both in the United States as well as to our deployed forces
22 overseas.

23 Senator Donnelly: Okay. Well, I am about out of time.
24 General Robinson, thank you again. As you head toward
25 retirement and travel around, when you go to the Air Force

1 Academy Notre Dame football game, I am curious as to who
2 you'll be rooting for.

3 General Robinson: Well, when your husband is an
4 Academy graduate and your brothers are Academy graduates,
5 there's really not much that I can say. So, go Air Force.

6 [Laughter.]

7 Senator Donnelly: Thank you.

8 Senator Fischer: Thank you.

9 Senator Sullivan?

10 Senator Sullivan: Thank you, Madam Chair.

11 Mr. Secretary, good to see you again, and I'm glad
12 you're in this position. You have a background with a lot
13 of expertise in these areas.

14 Let me ask on the missile defense review, when are you
15 anticipating that being done? And the reason I ask is one
16 of the things that we'll be looking at with regard to the
17 NDAA this year is building on what we did last year with
18 regard to missile defense. We had kind of a breakthrough, I
19 think, politically. We had a bill that was included as part
20 of the NDAA which was a pretty significant advancement in
21 missile defense that was very bipartisan. If you look at
22 the history, missile defense has not always been bipartisan.
23 As a matter of fact, it's kind of been a partisan issue.
24 But in this case, I think we made a breakthrough.

25 So I'm asking this because we will be looking at kind

1 of a missile defense 2.0 component of the NDAA, but we want
2 it to be significantly informed by the work that the
3 Pentagon is doing. So when do you anticipate that being
4 done, and is there a timeline we can hold you to that would
5 be in front of the work that we're doing on the NDAA, which
6 you know is kind of already starting?

7 Mr. Rood: We're at work now on the missile defense
8 review. There are a number of real challenges that we're
9 still working through how specifically we will address in
10 that report. But I am pleased that we've come a long way.
11 So I think this spring we firmly plan to complete the
12 report. Right now we still have some internal discussions
13 in the Department to work through, different opinions, as
14 you'd expect, on certain questions. But I think we'll have
15 something soon, and I understand your point about wanting to
16 take that into account, and the legislation that you
17 sponsored last year was very noteworthy in advancing the
18 ball down the field on missile defense, and the NDAA markup
19 schedule is certainly something that we would want to take
20 into account.

21 Senator Sullivan: Great. So do you think sometime in
22 April? I mean, I'm going to try to hold you to something
23 here, Mr. Secretary.

24 Mr. Rood: I wouldn't want to commit to --

25 Senator Sullivan: I'm putting your feet to the fire.

1 Mr. Rood: I feel the heat already rising around me.

2 Senator Sullivan: Good, good.

3 [Laughter.]

4 Mr. Rood: I wouldn't want to commit to April to get it
5 to the committee, but certainly we'll be deeper into our
6 discussions by that time. But I think in the next couple of
7 months here, that is our intention to finish it.

8 Senator Sullivan: Okay, because we don't want to miss
9 -- I know there's a lot of work, a lot of expertise going
10 into this, but we want to keep in mind the vehicle that will
11 move legislatively to enact some of these ideas and reforms
12 you have in the review is going to be the NDAA. We're going
13 to be marking it up late April, early June, so I think it's
14 important to keep that in mind.

15 One element that we started on in last year's
16 legislation but as I talk to the experts, essentially
17 everybody at the table and General Hyten, there seems to be,
18 I would say, broad-based consensus on what we need to do
19 more with regard to the next steps is space-based sensors
20 that are integrating both kind of theater and homeland
21 missile defense. Would that be something that all of you
22 are in agreement on, the need to accelerate and really focus
23 on that unblinking eye being able to track? Can I get an
24 answer from each of you, if that's something you think is
25 worthy of us to be working with you on to pursue as a

1 program on our missile defense systems?

2 General Greaves: Senator Sullivan, absolutely. That
3 is where we need to start.

4 Senator Sullivan: General Robinson, would you agree
5 with that?

6 General Robinson: I do, but let's not forget what we
7 need to make sure is that we can do what we need to do today
8 as we look to the future.

9 Senator Sullivan: I agree. Great point.

10 General Robinson: Okay. That's the only thing that I
11 would add to the conversation.

12 Senator Sullivan: Thank you.

13 Mr. Secretary?

14 Mr. Rood: Support in this year's budget, we're going
15 to talk about doing some demonstrations on space-based
16 sensor capability, as you know, and I think continuing to
17 build on that is one of the things that we would like to do.
18 We've got to look at that in the context of the other budget
19 challenges as we put together the next five-year budget
20 submission through the remainder of the year. But I
21 certainly am supportive of continuing to explore that.

22 Senator Sullivan: Okay.

23 General Dickinson?

24 General Dickinson: Absolutely. I think the better you
25 see the potential threat, the better we'll be in the

1 redundancy and resiliency of having terrestrial-based
2 sensors as well as space-based sensors that provide us that
3 capability, especially as we look to an increasing, evolving
4 threat. So the better information we have, the better
5 opportunity and the better ability we'll have to defeat it.

6 Senator Sullivan: Madam Chair, do I have time for one
7 more question?

8 Senator Fischer: Okay.

9 General Greaves: If I could add, just really quickly,
10 the integration of sensors in space with the terrestrial
11 sensors are absolutely critical for the real threat that we
12 see in front of us, the hypersonic threat, earth to burst
13 tracking, and that's why I said absolutely.

14 Senator Sullivan: Okay, great. Thank you.

15 Let me ask one final question that goes to the issue of
16 testing. Again, what we tried to do in the legislation last
17 year was really kind of give cover to all of you, not in
18 terms of "failures" but to start to make the point not only
19 to Congress but the American people that when you are
20 testing, even if you're not hitting a target or a successful
21 flight, you're learning, you're learning. Our space
22 program, you only have to look at that in the 1950s and
23 1960s. We were "failing" all the time. But we weren't
24 failing. We were learning.

25 Kim Jong Un, I would never want to use him as an

1 example, so I'm not, but the guy is obviously testing,
2 failing, and learning. So we are trying to provide you with
3 a sense from the Congress that, hey, the next time you do a
4 big test, if it doesn't hit the target, it certainly would
5 be my intention not to drag all of you up in front of this
6 committee and pound the table and look for the TV cameras
7 and try to berate the people with stars on their shoulders
8 that you're failing, because you're not failing, you're
9 learning.

10 So, we started that in last year's NDAA. We're trying
11 to accelerate and put you on a schedule to do tests at least
12 yearly. But what more can we do to help you in terms of
13 your testing, even if you're not always hitting the target?
14 My understanding in talking to some of the experts, there
15 will be certain tests that we're stretching the envelope,
16 from physics, from the activities that we're doing, so much
17 that you almost think that you're going to miss the target
18 anyway, and you're still going to learn a ton.

19 So what more can we be doing to help you in the
20 Congress so your culture of testing is not so worried about
21 some of us calling you up here the next time there's a
22 missed target when we're still learning tons?

23 General Greaves: Senator, I'd say what you've just
24 stated is sufficient, in my mind, in that we're not only
25 learning when we don't achieve an intercept, we're also

1 delivering capability.

2 One example I'll use is the recent SM-3 IIA mission
3 that we just executed. We did not achieve an intercept. We
4 believe we understand why we did not. But taking a look at
5 what we did achieve, we achieved the demonstration of
6 launching the SM-3 IIA from Aegis ashore, which is
7 absolutely critical for the sites in Romania, in Poland, and
8 if the Japanese continue with their acquisition of the two
9 Aegis source sites. It's a clear demonstration of that
10 capability.

11 We also increased the battle space for that weapon
12 system. We flew outside the organic radar's capability and
13 demonstrated feeding off-site sensor information,
14 engagement-quality information to that interceptor as it was
15 in flight.

16 We also certified the Aegis weapon system baseline that
17 accompanied all that capability.

18 So we did not achieve that intercept, but we learned
19 and we delivered capability. And what you have stated, sir,
20 is sufficient in my mind because it lends a level of
21 understanding that we do a lot more than just intercepts.

22 Senator Sullivan: Yes. Anyone else want to comment on
23 that? One thing I've thought is you guys could do a
24 background briefing to our wonderful friends in the media
25 who love to look for "failures." They don't really

1 understand the issues. And if you can background the media
2 on this, that it's not a failure, it's a learning
3 opportunity.

4 But anything else, Mr. Secretary? General?

5 Mr. Rood: I certainly concur with the approach.
6 Throughout our history, the things where we've had some
7 issues -- first of all, we generally have issues at some
8 level in virtually every new cutting-edge endeavor. So I
9 wholly concur with the thought process that you're taking.
10 And it's not just us. I think in some ways when we look at
11 our allies like Israel and their test regimen, they're much
12 more willing to go back out to the test range, begin a
13 flight test regimen, work through their issues,
14 understanding there are going to be bumps in the road.

15 So I certainly second the approach that you're trying
16 to encourage us to take.

17 Senator Sullivan: And as you probably know, Mr.
18 Secretary, the Israelis are actually testing right now in
19 the great state of Alaska, in Kodiak, Alaska, so they're
20 learning a lot there as well.

21 General Dickinson: Senator, if I could, just one final
22 comment on that.

23 Senator Sullivan: Yes, sir.

24 General Dickinson: As General Greaves described in
25 terms of learning a lot, first of all I think your approach

1 is right on. I think that's what we need.

2 But the other piece that goes in, not only on the
3 learning piece to the technology under development, but
4 there is a big learning piece between the warfighter as well
5 as the material developer, in this case MDA. So that's
6 actually a relationship that we enjoy on a daily basis
7 between the 100th and the 49th and the Missile Defense
8 Agency. That ability to have the warfighter working side by
9 side with the material developer in a test scenario, for
10 example -- and I'll use the FTG-15 a year ago, where we
11 actually had a crew out of the 100th that actually executed
12 the warfighting piece of that test, launching the
13 interceptor for that engagement -- is the fact that we learn
14 a lot from the warfighter's perspective.

15 And then we also are able to inform the material
16 developer on the road ahead, are they developing the things
17 that the soldiers can use. So I would just offer that.

18 Senator Fischer: My thanks to the panel today for your
19 testimony and your willingness to give us some pretty blunt
20 answers. We appreciate that, and I thank you all for your
21 service.

22 And thank you again, General Robinson, for your service
23 to this nation, and we wish you all the best.

24 General Robinson: Thank you, ma'am.

25 Senator Fischer: Thank you.

1 The hearing is adjourned.

2 [Whereupon, at 3:43 p.m., the hearing was adjourned.]

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