

Stenographic Transcript
Before the

Subcommittee on Strategic Forces

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

HEARING TO RECEIVE TESTIMONY ON MISSILE DEFENSE
STRATEGY, POLICIES, AND PROGRAMS IN REVIEW OF THE
DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2022
AND THE FUTURE YEARS DEFENSE PROGRAM

Wednesday, June 9, 2021

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ALDERSON COURT REPORTING
1111 14TH STREET NW
SUITE 1050
WASHINGTON, D.C. 20005
(202) 289-2260
www.aldersonreporting.com

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4 YEARS DEFENSE PROGRAM

5
6 Wednesday, May 26, 2021

7
8 U.S. Senate

9 Subcommittee on Strategic

10 Forces

11 Committee on Armed Services

12 Washington, D.C.

13
14 The committee met, pursuant to notice, at 4:30 p.m. in
15 Room SR-232A, Russell Senate Office Building, Hon. Angus
16 King, chairman of the subcommittee, presiding.

17 Subcommittee Members Present: King [presiding], Rosen,
18 Kelly, Fischer, Rounds, Cramer, and Tuberville.

1 OPENING STATEMENT OF HON. ANGUS KING, U.S. SENATOR
2 FROM MAINE

3 Senator King: This is a hearing on missile defense
4 strategy, policies, and programs in review of the Defense
5 Authorization Act Request for fiscal year 2022 and the
6 Future Years Defense Program. First let me thank our
7 witnesses, we have two panels, for appearing at today's
8 hearing.

9 Unlike prior missile defense hearings, we have decided
10 to add a nongovernmental witness panel to obtain a diversity
11 of viewpoints on the subject matter before us. The second
12 panel will be our government witnesses to help explain the
13 fiscal year 2022 budget request and answer questions that
14 may arise in the first panel.

15 The defense of our homeland and our allies from
16 missiles is a technologically complicated and geographically
17 unbounded problem. Today most missiles follow a predictable
18 ballistic trajectory, based on the laws of physics, and
19 those laws have not changed since the of Sir Isaac Newton.
20 They can fly tens of kilometers, as the recent conflict with
21 Israel demonstrated, or thousands of kilometers, with an
22 ICBM moving at about Mach 5.

23 We have spent hundreds of billions of dollars fielding
24 systems to intercept them, premised on this predictable
25 trajectory, and with relatively good success. However, a

1 new class of missiles, called hypersonic boost glide
2 missiles, are now being fielded with fields in excess of
3 Mach 20, and with an unpredictable, non-ballistic
4 trajectory. We have not fully fielded systems to track much
5 less intercept them. These missiles bring back issues of
6 technology and strategic stability that were once at the
7 forefront of the debates in ballistic missile defense
8 decades ago. I hope today's hearing can address the policy
9 implications of this new class of missiles as well as the
10 advances we are making in intercepting ballistic missiles
11 that we have invested so heavily in.

12 Again, let me thank all of you for appearing today.
13 After Senator Fischer's opening statement each witness will
14 have 5 minutes for their own opening statements, and then we
15 will alternate with members for 5-minute rounds of
16 questions.

17 Senator Fischer.

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

3 Senator Fischer: Thank you, Mr. Chairman, and welcome
4 to our witnesses. We look forward to hearing your views on
5 the broader missile defense policy, particularly as we hear
6 renewed calls for limitations on U.S. missile defense to be
7 discussed in negotiations with Russia.

8 General VanHerck and General Karbler, I also want to
9 express my gratitude to the men and women under your
10 commands who have made some extraordinary sacrifices over
11 the past year in order to perform their mission and defend
12 this nation. We are grateful for their service.

13 With respect to the fiscal year 2022 funding request, I
14 am pleased to see its support for programs like the next-
15 generation interceptor as well as space-based sensors and
16 hypersonic defense. However, I remain concerned about the
17 overall level of funding for missile defense proposed in
18 this year's budget. Despite continued testimony and
19 numerous classified briefings for members, where we hear
20 that threats are growing and becoming more complex,
21 particularly as adversaries increase their development of
22 highly capable hypersonic and cruise missile systems, this
23 budget proposes to fund the Missile Defense Agency at what
24 would be the lowest level since 2016.

25 I understand that these are part of the hard choices

1 being made across the entire defense budget, and the result
2 of adopting the top line that ultimately reduces spending on
3 defense. Nevertheless, I am concerned that this level of
4 funding, especially if sustained into the future, will be
5 insufficient to pace the growing threats facing our nation,
6 and we will be left in a precarious situation as a nation.

7 We rely on the candid testimony of our witnesses to
8 help us understand the difference between a lean diet and
9 starvation.

10 Thank you, Mr. Chairman.

11 Senator King: Thank you, Senator Fischer.

12 Dr. Soofer, would you make your opening statement,
13 please.

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1 STATEMENT OF DR. ROBERT M. SOOFER, FORMER DEPUTY
2 ASSISTANT SECRETARY OF DEFENSE FOR NUCLEAR AND MISSILE
3 DEFENSE POLICY

4 Mr. Soofer: Thank you, Chairman King and Ranking
5 Member Fischer. Thank you for the opportunity to appear
6 before the subcommittee.

7 For most of the post-Cold War period we have enjoyed a
8 relatively stable, bipartisan consensus on the role of
9 missile defense in U.S. national security policy, but that
10 was not always the case. Few national security issues
11 provoked more debate during the Cold War than missile
12 defense. The argument hinged on how one perceived the
13 relationship between missile defense and strategic
14 stability. One school of thought held that preserving
15 mutual vulnerability by limiting missile defenses was the
16 key to stability during a crisis and central for avoiding an
17 action-reaction arms race.

18 The other school of thought, equally strongly held,
19 argued that protection against nuclear missile attack was
20 not only a moral imperative but that even imperfect defenses
21 could contribute to deterrence of nuclear attack by
22 complicating an adversary's prospect of launching a
23 successful disarming first strike. But with the collapse of
24 the Soviet Union, U.S. missile defense policy shifted from
25 building defenses against near-peer powers to addressing the

1 emerging threat to the homeland posed by smaller, more
2 unpredictable regional actors, the so-called rogue states.

3 With a return to great power competition, U.S. missile
4 defense policy must also cope with China and Russia's
5 growing regional missile defense capabilities, meant to
6 prevent the United States from reinforcing its allies during
7 a conflict. So by centering on regional missile defense and
8 homeland protection against rogue regimes rather than
9 Russia, policymakers have been able to avoid those bitter
10 Cold War debates about strategic stability.

11 So today, if I may, I would like to address three
12 issues that seem to be attracting attention in the missile
13 defense policy world. One is continued funding for the
14 next-generation interceptor, and homeland defense, more
15 generally. Second is employing the SM-3 missile in support
16 of homeland defense. And third, the relationship between
17 arms control and missile defense.

18 So to stay ahead of the North Korean ballistic missile
19 threat to the homeland, the Obama administration added 14
20 ground-based interceptors to the 30 fielded by the Bush
21 administration. And they sought to enhance the ground-based
22 nuclear defense system through a redesigned kill vehicle,
23 RKV. The Trump administration altered that acquisition
24 approach to include a fully modernized interceptor, both the
25 rocket and the kill vehicle, and plan to add an additional

1 20 GBIs, to bring the total to 64. It appears the Biden
2 administration has approved the NGI development to proceed.

3 So some national security experts criticize the cost,
4 the efficacy, and even the necessity for NGI, and GMD more
5 broadly. I would like to offer the following points in
6 response.

7 First of all, while we believe North Korea intends to
8 grow its ICBM force in the coming years, intelligence
9 agencies cannot know with certainty the pace of that growth.
10 Today it is reasonable to assume that an additional 20 GBIs,
11 combined with a nuclear vehicle and improved reliability of
12 a GMD system may be sufficient to stay ahead of the threat.
13 We also hope to eliminate a number of North Korean ICBMs on
14 the ground, easing the burden on the GBIs.

15 Second, with respect to costs, we need to understand
16 this in context. Combined NGI and GMD funding will account
17 for about 1/2 of 1 percent of the DoD budget from FY 2021 to
18 FY 2026. These are not unreasonable sums to protect a
19 nation against North Korea.

20 Third, proceeding with NGI, and homeland defense more
21 broadly, is important for U.S. grand strategy. Modernizing
22 and expanding our homeland defense underpins President
23 Biden's push to revitalize our ties with allies and friends.
24 An important element of reviewing alliances is convincing
25 allies that the United States is prepared to run risks on

1 their behalf. Strengthening U.S. homeland defenses provides
2 that confidence by reducing our own vulnerability to North
3 Korean reprisals. After all, why would our allies expect us
4 to come to their defense if we are not first willing to
5 provide for our own defense?

6 Finally, Russia and China, they are going to complain
7 about NGI, despite the fact that they are modernizing their
8 own suite of missile defense systems. They deploy more
9 homeland defense interceptors than we do, 68 nuclear-tipped
10 missiles, and they are modernizing hundreds of regional air
11 and missile defense systems, a missile defense posture which
12 exceeds the U.S., in some respects.

13 My second issue is the SM-3 missile. As you know, the
14 SM-3 missile is a regional missile, based on ships. When we
15 did the Missile Defense Review in the Trump administration
16 we asked the question, could we use the SM-3 to provide an
17 additional layer of protection for the homeland, in addition
18 to the GBI? In fact, Congress was thinking along the same
19 lines, because it directed, in the FY 2018 NDAA, that we
20 conduct a test of the SM-3 missile against a simple ICBM
21 target. That test took place last November, resulting in a
22 successful intercept.

23 Now while the SM-3 IIA missile deployed on Aegis ships
24 will continue to play an important regional defense role,
25 the Interceptor may provide a modest additional measure of

1 protection for the homeland against North Korean ICBMs in an
2 emergency or during a crisis. The ship would have to be in
3 the right place, near our coast, and the right time, and
4 given its smaller size, compared to the GBI, the Interceptor
5 would not provide coverage of the entire United States.
6 Moreover, the SM-3 would not be capable against the more
7 complex Russian and Chinese threats, armed with penetration
8 aids and decoys, nor would it be able to cope with Russia's
9 nuclear air and sea launch cruise missile that can also
10 range the U.S. homeland.

11 For these reasons, it is unlikely this capability will
12 upset strategic stability for the foreseeable future, if
13 ever. And as President Putin himself has noted, by the end
14 of this year, 90 percent of Russia's nuclear forces will be
15 modernized, and, in his words, "capable of confidently
16 overcoming existing and even projected missile defense
17 systems."

18 Now some have argued that Russia's new novel systems
19 are a response to our missile defense plans. Well, there is
20 an alternative explanation for why Russia is developing
21 these new novel nuclear capabilities. According to Rose
22 Gottenmoeller, Obama's former New Start chief negotiator, she
23 said Putin is "after nuclear weapons for another reason, to
24 show that Russia is still a great power to be reckoned with.
25 These exotic systems have more of a political function than a

1 strategic or security one." In my view, it is more likely
2 an improved SM-3 missile, even in limited numbers, will
3 contribute to collective efforts to meet the challenges
4 posed by the North Korean regime, thereby enhancing regional
5 and international strategic stability.

6 In a final analysis, we cannot allow Russia or China to
7 have a veto over the protection of the United States against
8 rogue state threats.

9 Finally, on arms control. There is a suggestion that
10 you cannot have both missile defense and arms control, and I
11 think history suggests the opposite. The United States has
12 been pursuing missile defense seriously since the mid 1980s.
13 This was the Reagan Strategic Defense Initiative, and since
14 we withdrew from the ABM treaty in 2002. So despite the
15 fact that we have been pursuing missile defenses, Russia and
16 the United States have signed three arms control treaties
17 that have together drawn down nuclear forces by some 85
18 percent, compared to Cold War highs.

19 Look, if Russian leaders were seriously alarmed about
20 U.S. missile defenses, they would not have agreed to these
21 reductions, or more recently to extend the New START Treaty
22 for another 5 years.

23 To conclude, I would just add that homeland and
24 regional missile defenses provide protection for the nation,
25 its deployed forces and allies, and are critical enablers of

1 a U.S. grand strategy that relies on alliances to maintain a
2 favorable balance of power and a peaceful world order. For
3 about 2 percent of annual defense appropriations, missile
4 defense provides the United States the freedom of action to
5 respond to crises, to shore up allies, to deter adversaries,
6 and, if necessary, to defeat them and limit damage should
7 deterrence fail.

8 And finally, deterrence, to be successful, requires the
9 demonstration of resolve. Missile defense is a very
10 tangible measure of U.S. resolve. Failure to do what is
11 necessary to protect this nation against North Korea, a
12 country with one of the lowest-ranked economies in this
13 world, could call into question U.S. resolve and commitment
14 in the eyes of ally and adversary alike. This would damage
15 U.S. strategic capability and have serious implications for
16 America's broader foreign policy objectives.

17 Thank you.

18 [The prepared statement of Mr. Soofer follows:]
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1 Senator King: Thank you. In the interest of time we
2 are going to submit the backgrounds of Dr. Soofer and Mr.
3 Panda for the record.

4 Mr. Ankit Panda, please.

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1 STATEMENT OF ANKIT PANDA, STANTON SENIOR FELLOW,
2 NUCLEAR POLICY PROGRAM, CARNEGIE ENDOWMENT FOR INTERNATIONAL
3 PEACE

4 Mr. Panda: Thank you, Chairman King, Ranking Member
5 Fischer, and distinguished members of the subcommittee. I
6 am honored to be here today before you to offer my views on
7 the missile defense strategy of the United States and its
8 relationship to strategic stability with our nuclear-armed
9 adversaries.

10 My name is Ankit Panda. I am a Washington, D.C.-based
11 scholar of the Carnegie Endowment for International Peace,
12 where I study nuclear strategy and missile defense, among
13 other issues. For the last 20 years we have sought to
14 develop a national missile defense architecture capable of
15 defending the homeland against limited missile threats,
16 namely those from North Korea, which today possesses a
17 minimally capable, rudimentary, intercontinental range
18 ballistic missile capability, and Iran, which may one day
19 possess such a capability.

20 Today our ambitions for national missile defense remain
21 large. Plans to develop a layered homeland missile defense
22 architecture, in particular, for a major plank of the
23 Missile Defense Agency's near-term efforts. This layered
24 architecture stands to take what was once limited plans for
25 a modest, self-contained homeland missile defense

1 architecture, captured entirely in the Ground Based
2 Midcourse Defense system and its 44 deployed Ground-Based
3 Interceptors, soon to be 64, deployed in Alaska and
4 California, and extended to include sea-based Aegis missile
5 defense, and eventually even ground-based Terminal High
6 Altitude Area Defense systems.

7 Allow me now to posit that this country's national
8 security could be meaningfully enhance through the tabling
9 of limitations on strategic or homeland missile defense, as
10 part of a reciprocal process involving Russia, and possibly
11 China. Doing so would not only reduce fiscal and
12 opportunity costs in ways that would augment both our
13 conventional deterrence capabilities and nuclear
14 modernization plans, but also promote more stable nuclear
15 deterrence with our adversaries.

16 The case for limitations rests fundamentally on a
17 national reckoning with the necessities of nuclear
18 deterrence. As the last administration's 2019 Missile
19 Defense Review notes, we rely on nuclear deterrence to cope
20 with the strategic forces of Russia and China, which are
21 objectively too vast to be fully absorbed by our existing
22 missile defenses. That I do not dispute.

23 But Moscow and Beijing reason about our intentions, as
24 we often do theirs, based on our actions and not our
25 statements. As a result, both fear the ability of our

1 current and future missile defense posture to degrade their
2 strategic nuclear retaliatory capability, if not to
3 completely disrupt it. This, in turn, begets instability.

4 To be clear, I do not posit that our missile defense
5 programs are the sole drivers of Russian and Chinese
6 strategic modernization and force expansion. However, they
7 are salient, and considerable evidence suggests that we are
8 seeing precisely the kind of action-reaction relationship
9 between strategic offense and defense that spurred the first
10 round of U.S.-Soviet arms control during the late 1960s once
11 again today.

12 As was the case back then, limitations should not be
13 unilateral but should nonetheless be on the table, in
14 particular, as we seek a follow-on agreement with Russia to
15 the 2010 Strategic Arms Reduction Treaty, the last treaty of
16 its kind to remain in force between our two countries and
17 due to expire in 2026.

18 Congress, in particular, has led on this issue in the
19 past and can do so again. For instance, during the final
20 decade of the Cold War it was Congress that limited the
21 Reagan administration's desire to reinterpret the ABM treaty
22 in a way that might permit for a capacious expansion of the
23 Strategic Defense Initiative. This facilitated strategic
24 stability and Congress can once again play this role.

25 So there are numerous ways in which Congress might lead

1 on this issue to forestall what I see is a costly 21st
2 century arms race that is already underway and enhance
3 American national security in the process.

4 First, Congress should ask the Department of Defense to
5 study and assess the extent to which our investments in
6 missile defense are spurring qualitative and quantitative
7 force structure changes by our adversaries. DoD has
8 observed, in recent congressional mandated reports, that
9 missile defense is driving certain forms of Chinese and
10 Russian modernization, for instance. A fuller study could
11 inform our national decision-making to ensure a prudent path
12 forward.

13 Beyond this, Congress should adopt a resolution
14 acknowledging the action-reaction relationship between
15 strategic offensive and defensive arms, as the preamble to
16 the New START Treaty in 2010 did. In doing so, this body
17 can render more credible attempts by this administration, or
18 a future administration, to seek limitations on Russian and
19 Chinese offensive arms of particular concern that would
20 enhance American national security.

21 Finally, Congress should remain actively involved in
22 ensuring the Missile Defense Agency is subjecting the
23 Ground-Based Midcourse Defense system to realistic testing
24 and evaluation. This can include mandating testing against
25 ICBM target missiles of longer ranges, that would be more

1 representative of, say, a North Korean ICBM. Future testing
2 should also include more realistic environmental and other
3 stressors, including decoys designed to emulate the infrared
4 signature of a target re-entry vehicle, something that is
5 eminently within North Korea's reach today.

6 My written testimony for this subcommittee discusses
7 these and other issues germane to today's hearing in greater
8 detail. Thank you for this opportunity today, and I look
9 forward to your questions.

10 [The prepared statement of Mr. Panda follows:]

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1 Senator King: Thank you both.

2 Mr. Soofer, I am trying to understand this. Our
3 missile defense system is not designed to intercept missiles
4 from either China or Russia. Is that correct?

5 Mr. Soofer: Yes, sir.

6 Senator King: And so what is our principal defense
7 against missiles from China and Russia?

8 Mr. Soofer: The same defense that we had during the
9 Cold War, sir, the nuclear deterrent.

10 Senator King: Deterrent. If that is effective against
11 China and Russia, why isn't it effective, or wouldn't it be
12 effective against North Korea or Iran?

13 Mr. Soofer: Right. Well, North Korea, arguably, may
14 not have the same rational perspective on these issues as
15 Russia.

16 Senator King: But wouldn't the leader of North Korea
17 understand that if he attacks this country, his country
18 would disappear from the map? I mean, that would deter even
19 the most unstable leader, it would seem to me.

20 Mr. Soofer: Well, the question is who has got more at
21 stake at this point. The concern is that he would not
22 believe that we would use nuclear weapons against North
23 Korea for fear of his reprisal against the United States.
24 And by having missile defenses, you take away that
25 consideration.

1 Senator King: Let me change the subject slightly to
2 the capability of the missiles. The missile defense system
3 that we are talking about is principally to deal with the
4 threat of ballistic missiles. Is that correct?

5 Mr. Soofer: Yes, sir.

6 Senator King: And my understanding is that it would
7 not deal with the threat of hypersonic glide vehicles.
8 Correct?

9 Mr. Soofer: Well, current they do not, but the Missile
10 Defense Agency is working on defense against hypersonics,
11 both against long-range systems and the shorter-range
12 systems our forces would encounter in regional campaigns.

13 Senator King: So we believe that there will be a
14 future capability. Is that going to be a capability of the
15 new missiles that we are talking about authorizing in this
16 process?

17 Mr. Soofer: I am not completely familiar with the
18 budget requests at this point, but I do know that the
19 Missile Defense Agency is working on sensors and an
20 intercept capability against hypersonic threats. But that
21 is not what I was referring to in the SM-3 IIA missile. The
22 SM-3 IIA is a regional missile, a Navy missile, that
23 intercepts ballistic missiles on the midcourse phase. And
24 the hope is that we could give it some capability to also
25 intercept very simple North Korean ICBM missiles that are

1 headed from North Korea to, say, Guam or Hawaii, or even the
2 continental United States.

3 Senator King: Mr. Panda, you talked about the action-
4 reaction. There is a finite number of Interceptors. Right
5 now it is 44, and we are talking about going to 64. Can't
6 that capability be defeated by North Korea simply by having
7 more incoming missiles?

8 Mr. Panda: Excellent question, Senator. So I will
9 just first note that I am the author of a recent book on
10 North Korean strategic nuclear forces, and I spend more time
11 than I would like looking at pictures of North Korean
12 missiles.

13 As far as I know, North Korea today has 10 ICBM
14 launchers. As far as I am also aware, based on open
15 sources, MDA's concept of operations for GMD relies on using
16 four Interceptors per incoming target re-entry vehicle, soon
17 to become three, but currently four, I believe.

18 So if we just do the math, North Korea would need to
19 add a single additional ICBM launcher to potentially
20 saturate GMD, and based on GMD's testing record, the single-
21 shot probability of kill, which is the probability that a
22 single GMD system shot at an incoming North Korean re-entry
23 vehicle would succeed, based on open sources again, that
24 number appears to be just a little over 50 percent.

25 So based on that assessment, Senator, I would say that

1 North Korea can probably today bet on delivering a
2 thermonuclear warhead to the continental United States, and
3 I believe that that is entirely the reason that Kim Jong-un
4 today feels that he has a nuclear deterrent. He declared,
5 in November 2017, that his nuclear deterrent was complete,
6 before turning to negotiations with the United States.

7 So I do think that that would be a correct assessment.

8 Senator King: But this is exactly what you are talking
9 about, is as you build up your missile defense then your
10 adversary is incited to build up their side of the
11 offensive capability. Is that your position?

12 Mr. Panda: That is correct. North Korea, of course,
13 is quite resource constrained, Senator, so if we were to go
14 to 64 GBIs I cannot predict today whether Kim Jong-un would
15 have the resources or the wherewithal to keep building ICBM
16 launchers and ICBMs to cope with that. I will, however,
17 point out that qualitative modernization is also underway in
18 North Korea. In October 2020, North Korea demonstrated a
19 missile, the largest road-mobile missile anywhere in the
20 world today, because most countries do not deploy road-
21 mobile liquid propellant missiles like North Korea does.
22 But the missile that they demonstrated appears to be large
23 enough to carry multiple re-entry vehicles. North Korea is
24 also working on countermeasures, which will include
25 sophisticated and unsophisticated decoys.

1 And so I completely think that even North Korea can
2 certainly cope with qualitative advancements to our own
3 missile defense.

4 Senator King: Mr. Soofer, I am out of time, but I
5 think you wanted to respond?

6 Mr. Soofer: Right. You know, we do not just try to
7 deal with North Korea and ICBMs with active missile defense.
8 It is a combination of deterrence, as you suggest, as well
9 as attack operations. We are going to try to find as many
10 of these launchers on the ground as possible and take them
11 out before they launch. And then there is active defense,
12 right?

13 But the bigger point here is if we were not to compete
14 with North Korea, if we were not to build missile defenses
15 against the North Korean threat, what kind of signal is that
16 going to send to our allies? If we are not willing to
17 defend ourselves against North Korea, a country that can
18 barely afford to feed itself, why would our allies think
19 that we are going to risk our own lives to come to their
20 defense?

21 Senator King: Senator Fischer.

22 Senator Fischer: Thank you, Mr. Chairman. Dr. Soofer,
23 I am sure you have seen a recent letter by a number of
24 advocates to President Biden encouraging him to discuss
25 limitations on U.S. missile defenses in the upcoming talks

1 with Putin. The letter refers to comments the President
2 made back in 2001, when as a Senator he opposed the Bush
3 administration's plans to deploy a national missile defense
4 system, and predicted it could trigger an arms race with
5 Russia and China.

6 So let me ask you, did that prediction come true, and
7 what empirical evidence is there linking missile defense to
8 an arms race, and more broadly, is there evidence that
9 missile defense is incompatible with arms control?

10 Mr. Soofer: Thank you, Senator. I do not think that
11 is what has happened. So exactly what happened. We
12 withdrew from the ABM Treaty in 2002. Everybody had
13 anticipated at the time that you had this huge arms race.
14 Both sides would build more offenses to overcome defenses.
15 And what did we have? We had the Moscow Treaty, which took
16 us from 6,000, under START, to 2,200. We went down from
17 6,000 to 2,200, even though we withdrew from the ABM Treaty.
18 And then we had the New START Treaty, which took us down to
19 1,550.

20 What arms race are they talking about? There has been
21 no arms race. In fact, it is just the opposite. When we
22 signed the ABM Treaty in 1972, the Russian inventory, the
23 Soviet inventory, went from about 2,500 warheads to over
24 10,000 nuclear warheads. It was just the opposite. This
25 idea of action-reaction, it is too simple. There are many

1 reasons why countries choose not to build nuclear weapons.

2 But clearly our withdrawal from the ABM Treaty, our
3 deployment of 44 Ground-Based Interceptors, has not spurred
4 an arms race. The Russians recently agreed to extend the
5 New START Treaty by 5 years. If they were so alarmed by our
6 missile defenses and our plans to add 20 more NGIs, why
7 would they agree to that?

8 Senator Fischer: Dr. Soofer, Russia and China have
9 been expanding their nuclear arsenals in recent years, but
10 these actions have come while U.S. missile defense
11 capabilities have remained relatively unchanged. For
12 example, the most significant enhancement of our homeland
13 missile defense system has been the construction of the
14 radar in Alaska. With the failure of the RKV program, and
15 our GMD system has not received the upgrades that were
16 planned for that, and then we have seen the expansion, the
17 proposed expansion, of the fleet from the 44 Interceptors to
18 64, which was announced in 2017, it has not taken place.

19 So I think we have demonstrated also that the SM-3 IIA
20 missile has some capabilities against the ICBMs, but this
21 demonstration was conducted in December 2020, which is long
22 after the Russian and the Chinese have undertaken their
23 nuclear expansions. That is a comment.

24 What is your view of Russia's complaints against U.S.
25 missile defenses and its attempt to portray its actions,

1 such as a deployment of a variety of new nuclear systems
2 that were announced by Putin in 2018 as responses to our
3 nuclear defense programs?

4 Mr. Soofer: Senator, as I quote I read by Rose
5 Gottemoeller suggests, Russia does this for political
6 reasons. They have their own domestic political problems.
7 Putin has to exert his control over the oligarchs, right?
8 He is more concerned about sowing dissention between the
9 U.S. and its allies. Missile defense is a prime vehicle for
10 doing that. And even here in the United States, they
11 interfere with our debates by suggesting that missile
12 defense is something that alarms them. But again, the
13 evidence suggests that despite their talk, they continue to
14 negotiate with us. They continue to reach reductions.

15 I am not suggesting that we do not talk to Russia about
16 this. Even the Trump administration, on at least five
17 occasions, spoke to the Russians about the role of missile
18 defense and strategic stability. You know, if the Biden
19 administration wants to pursue that, then I think it is
20 totally appropriate.

21 Senator Fischer: Does Russia need a nuclear-powered
22 cruise missile to overwhelm our missile defenses?

23 Mr. Soofer: Clearly no. Clearly not. They have air-
24 launched cruise missiles, sea-launched cruise missiles. So
25 no.

1 Senator Fischer: Thank you.

2 Senator King: Senator Kelly.

3 Senator Kelly: Thank you, Mr. Chairman. Mr. Panda,
4 earlier you were talking about the probability of kill of
5 our systems. I think you said a PK of 0.5, roughly. So
6 where does that data come from, if you can say in an open
7 hearing? And then I wanted to go back to the number of
8 ICBMs that DPRK, that you believe that they have, and
9 obviously there are two approaches to this. We can increase
10 the number of GBIs. Currently I believe we have 44. But
11 the other approach here could be how do we improve on the PK
12 number? So can you elaborate a little bit about where we
13 are on that?

14 Mr. Panda: Absolutely, Senator. So, first of all, I
15 have never been in government. I have never held a
16 clearance, so my assessments are entirely based on open
17 sources. The actual PK number is, I believe, classified.
18 The assessment that I am offering is primarily based on the
19 testing history of the system, which allows us to
20 extrapolate reasonably. Of course, there have been multiple
21 statements made by officials expressing their confidence in
22 the system, which I will just point out that that is
23 different from the technical parameters of GMD's actual
24 performance.

25 So based on your other observation about the two

1 possible approaches on how we can get our PK up, I will say,
2 Senator, if we are to sustain missile defenses -- and when I
3 talk about limitations I am not talking about eradicating
4 missile defense by any means. I do believe that the ABM
5 Treaty, for instance, allows for 100 Interceptors at two
6 fixed sites, per the 1974 protocol to the treaty.

7 What I do want to see if we do continue to invest in
8 missile defense, that we do it right, that testing and
9 evaluation are realistic. I will point out that GMD has
10 been tested against ICBM-class targets that MDA describes
11 as, quote, "threat representative." But to my knowledge,
12 the target missiles used in these test are far shorter range
13 than an actual ICBM that would have to travel from North
14 Korea's northern provinces, where they base their ICBM
15 forces, to the U.S. homeland.

16 So I will just emphasize that again, Senator. If we
17 are to continue to proceed with maintaining a missile
18 defense, and this is regardless of whether or not we pursue
19 arms control, our missile defenses should be realistically
20 tested and evaluated. If we are going to continue to spend
21 taxpayer money on this enterprise, it needs to be realistic.
22 It needs to demonstrate a capability that is real. Because
23 ultimately -- and I believe my co-witness pointed this out
24 -- missile defense comes into play when strategic deterrence
25 has failed, and ultimately no one in this room is in favor

1 of allowing the United States to face a nuclear attack.

2 So if nuclear deterrence is here to stay, my
3 preference, and I am sure the preference of most Americans,
4 will be that it works as best as it can, and that means that
5 testing and evaluation need to be done properly and done in
6 ways that are realistic. Thank you.

7 Senator Kelly: So just to follow up on this. So we
8 are talking with SM-3 GBIs, we are talking midcourse. If we
9 start to look into systems that could intercept in a boost
10 phase, any sense for what kind of probability of kill we
11 would have with those systems at this point?

12 Mr. Panda: Sure, Senator. That is an excellent
13 question. Boost-phase defense has been a topic of query for
14 over 20 years. There have been multiple studies done. The
15 primary pitfall with boost-phase defense is that we
16 physically need to base our Interceptors, or whatever launch
17 vehicle for the Interceptors, be that a drone, a fighter,
18 near the adversary's territory. And really the only country
19 with which this would be viable would be North Korea, which
20 has ocean and international waters on both sides. But
21 again, this would only come into play in a crisis.
22 Effectively, it would be simply infeasible to keep an F-35
23 or a drone or any other kind of launch vehicle in the air
24 long enough, at all times, to intercept any North Korean
25 missile launch.

1 Another point that I will point out is that, you know,
2 we have been talking strategic stability, and you raised
3 this point with boost-phased defense. There are, of course,
4 other concepts that we have been looking into --
5 counterforce targeting of North Korean launchers before they
6 can launch, left-of-launch techniques, including
7 cyberattacks.

8 A subcomponent of strategic stability that has not been
9 surfaced in today's discussion is crisis stability. We have
10 talked about arms race stability, and that mostly refers to
11 the peacetime buildups on both sides. Crisis stability
12 refers to our incentives in a crisis, and for Kim Jong-un,
13 knowing that the United States is so fundamentally
14 qualitatively advanced compared to North Korea, the
15 incentives to use nuclear weapons first in a crisis grow the
16 more we indicate that we are willing to destroy his missiles
17 early in a crisis. Kim Jong-un has fundamentally developed
18 these weapons because he thinks that using them first gives
19 him the best rational chance at survival in a conflict.

20 And so I think, you know, if I could counsel one thing
21 it would be that it is fine to pursue missile defense. It
22 is fine to protect the U.S. homeland from nuclear attacks
23 from North Korea. But we need to be careful about the kinds
24 of incentives that we generate for the North Korean
25 leadership in a crisis. Because my assessment is that

1 fundamentally that Kim Jong-un is rational, but that his
2 rationality, ultimately, has manifested in a way that favors
3 the first use of nuclear weapons in a crisis.

4 Senator Kelly: Thank you.

5 Senator King: Senator Cramer.

6 Senator Cramer: Thank you, Mr. Chairman. I just kind
7 of want to follow up a little bit with that. Given that
8 theory, would the same thing apply to, say, missile-tracking
9 satellites, and everything else in the value chain? Do
10 those have the same impact on possible response?

11 Mr. Panda: Thank you, Senator. Missile tracking can
12 facilitate counterforce targeting of North Korean assets,
13 and ultimately, because these assets will be used anywhere
14 round the world where our forces need them, they can simply
15 also be used against China and Russia, this has already led
16 to, for instance, Russia's development of a ground-based
17 laser, called Peresvet, which is designed to disrupt, dazzle
18 our observation satellites. The Russians do not want us
19 tracking their ICBM transporter.

20 We have not talked a lot about China today, so let me
21 just offer one observation there. The primary Chinese
22 concern is not solely our missile defense. China is also
23 quite concerned about our conventional precision strike
24 capabilities. Because Chinese nuclear forces are lean, I
25 believe the Defense Intelligence Agency has attested to the

1 fact that Chinese nuclear forces are currently in the low
2 200s but expected to double in size by the end of the
3 decade.

4 One of the things that China is particularly concerned
5 about is a conventional campaign, waged by the United
6 States against its nuclear forces, which are primarily land-
7 based. The People's Liberation Army Force, for the first
8 time since the 1980s, has now readopted a nuclear mission,
9 beginning in 2019.

10 But all of this means that missile tracking, while an
11 important component of facilitating missile defense and
12 counterforce, can ultimately be destabilizing.

13 Senator Cramer: Dr. Soofer, would you want to respond
14 to any of that?

15 Mr. Soofer: Well, it can be destabilizing, but it can
16 also be very stabilizing if it provides deterrence. If
17 China understands that we have these capabilities in place,
18 they will not start a war, and you have deterrence at the
19 outset. So in that case it can be stabilizing. It depends
20 on your perspective.

21 Senator Cramer: Thank you. That is all I have. Thank
22 you, Mr. Chairman.

23 Senator King: Senator Tuberville.

24 Senator Tuberville: Thank you, Mr. Chairman. Dr.
25 Sooter, you previously stated that a strong missile defense

1 system is exactly how U.S. prevents escalation and protects
2 our nation. We are falling behind our peers and near-peers
3 at an alarming rate. If U.S. continues down this path, what
4 do you believe the outcome would be, and what changes do you
5 believe we should -- what should happen in the next 5 years?

6 Mr. Soofer: Thank you, Senator. I think it is
7 important, perhaps, to think of the problem set in two ways.
8 One is the threat to the homeland, right, and that is by
9 Russia and China and by the rogues. For Russia and China,
10 we are going to have to continue to rely on nuclear
11 deterrent to prevent them from attacking us, right? But for
12 the rogues, we have to stay ahead of them. If we do not
13 stay ahead of them, again, it shows the rest of the world
14 that we lack the will to compete with North Korea and China,
15 and that makes our allies very nervous. So that is the
16 first problem set.

17 The second problem set has to do with regional threats.
18 The strategy of Russia in Europe and China in Asia is to
19 keep us from reinforcing our allies during war. If they can
20 keep us from intervening they feel that they can win. And
21 so they are building all these missiles in order to attack
22 our bases, our ports, our ships, to keep us from
23 reinforcing.

24 Our policy here is to strengthen our regional missile
25 defenses, help our allies be able to defend themselves with

1 regional defenses, and again, all this provides a deterrent
2 at the outset so they do not contemplate even a conventional
3 attack. And I think there is fairly broad bipartisan
4 consensus on that approach to missile defense.

5 Senator Tuberville: Thank you. Mr. Panda, GMD dates
6 back 15 years. Are you supportive of updating the NGI?

7 Mr. Panda: Well, Senator, I think it really depends.
8 If we proceed with NGI, I will not focus on the cost issue
9 because ultimately, at the end of the day, if we have a
10 missile defense system that can prevent damage to the U.S.
11 homeland from thermonuclear attack and it works, it is very
12 difficult to really put a price tag on that. It is
13 effectively priceless. Of course, if we look at the record,
14 reality is a little bit different there.

15 So once again I will just emphasize that if we are to
16 proceed with NGI, and if we are to pony up the big taxpayer
17 bill that comes with that, my preference and my sort of
18 counsel would be that we proceed and demand that testing is
19 done in a way that really does facilitate the development of
20 a missile defense system that can work and can provide that
21 level of defense. Because ultimately, that map I sort of
22 laid out earlier, when it comes to North Korean ICBM -- and
23 again, recognizing that that is the primary reason we have
24 homeland missile defense -- the more we can improve that,
25 the fewer number of interceptors we can assign to incoming

1 re-entry vehicles, the harder it becomes for Kim Jong-un to
2 keep up with that pace. Unfortunately, based on our current
3 approach, that just does not seem to be viable.

4 Senator Tuberville: Thank you. Dr. Soofer, do you
5 want to add something?

6 Mr. Soofer: I concur.

7 Senator Tuberville: Thank you. Thank you, Mr.
8 Chairman.

9 Senator King: I want to thank this panel. You have
10 been very thoughtful and provocative, which is exactly what
11 we needed to discuss the strategic underpinning of this
12 subject. And I want to call our next panel to the table.

13 I hope that both of you, in light of the questions and
14 the discussion today, will file additional testimony if you
15 feel it would be helpful to the committee. I appreciate it.

16 Our government witnesses, Ms. Leonor Tomero, this is
17 your second time in a couple of weeks, so welcome back to
18 the committee. She is Deputy Assistant Secretary of Defense
19 for Nuclear and Missile Defense Policy; General Glen
20 VanHerck, Commander, U.S. Northern Command and North
21 American Aerospace Defense Command; Lieutenant General
22 Daniel Karbler, Commander, U.S. Army Space and Missile
23 Defense Command and Joint Functional Component Command for
24 Integrated Missile Defense; and Vice Admiral Jon Hill,
25 Director of the Missile Defense Agency.

1 I think we will start with Ms. Tomero on the policy
2 question, Deputy Assistant Secretary of Defense for Nuclear
3 and Missile Defense Policy.

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1 STATEMENT OF LEONOR TOMERO, DEPUTY ASSISTANT SECRETARY
2 OF DEFENSE FOR NUCLEAR AND MISSILE DEFENSE POLICY

3 Ms. Tomero: Thank you, Chairman, and thank you for
4 welcoming me back to the subcommittee. Chairman King,
5 Ranking Member Fischer, and distinguished members of the
6 subcommittee, thank you for the opportunity to testify
7 before you today on the missile threat and the Department's
8 missile defense policy and priorities. I ask permission to
9 submit my opening remarks for the record.

10 Senator King: So ordered.

11 Ms. Tomero: Thank you. Along with left-of-launch
12 capabilities in our nuclear and conventional forces, missile
13 defense plays a key role in U.S. defense. With regard to
14 the threat environment, as missile technology matures and
15 proliferates, the threat to the U.S. homeland, allies,
16 partners, and our deployed forces is increasing. The
17 Democratic People's Republic of Korea, DPRK, continues
18 development and deployment of more capable intercontinental
19 ballistic missiles that have destabilized and reshaped the
20 security environment in East Asia. Iran's short- and
21 medium-range ballistic missiles comprise the largest missile
22 force in the Middle East. Both the DPRK and Iran are
23 extending the range reliability and accuracy of their
24 missile forces.

25 Additionally, Russia and China continue to develop and

1 field increasingly advanced and diverse regional offensive
2 missile capabilities. These capabilities form the backbone
3 of their anti-access aerial denial strategy, intended to
4 deny the United States freedom of action to protect military
5 power and to protect our allies and partners.

6 To address these evolving challenges, the Department
7 will review its missile defense policies, strategies, and
8 capabilities to ensure that we have effective missile
9 defenses. The review will align with the National Defense
10 Strategy and contribute to the Department's approach to
11 integrated deterrence, and we expect to complete this
12 strategy by January of 2022.

13 With regard to homeland defense, the Department is
14 committed to defending the United States against rogue state
15 missile threats. DoD recently initiated the development of
16 the next-generation Interceptor, and NGI will increase the
17 reliability and capability of missile defense of the United
18 States. As this program moves forward, it will align with
19 the administration's defense goals and priorities.

20 With regard to regional defense, missile defenses would
21 also remain central to maintaining the U.S. enduring
22 advantage to flow forces into militarily consistent regional
23 environment and to safeguard those forces should a conflict
24 arise.

25 Additionally, the Department will continue to ensure

1 that we bring a more integrated approach to air and missile
2 defense that not only assists with defense against various
3 types of ballistic missile threats but also enables defense
4 against cruise missiles and unmanned aerial systems. IAMD
5 will field interoperable and integrated missile defense
6 sensors, Interceptors, and command and control to improve
7 capability against a range of threats.

8 With regard to critical enablers, in addition to
9 improving today's operational systems, we are examining new
10 enabling technologies. Secretary Austin has noted the
11 importance of enhancing our global network of integrated
12 sensors. Space-based and land-based sensors enable a
13 variety of capabilities such as detection, tracking, and
14 targeting through all phases of flight for an incoming
15 missile. U.S. commercial innovation is already transforming
16 this field.

17 In FY 2022, we will continue to develop the prototype
18 Hypersonic and Ballistic Tracking Space Sensor, the HBTSS,
19 that will allow the tracking of hypersonic threats and add
20 resiliency to our sensor architecture. The Department's
21 approach for regional hypersonic defense will first focus on
22 defense in the terminal phase.

23 Information superiority is critical to the future
24 battlefield, and is necessary to enable rapid planning and
25 employment in a joint operating environment. To that end,

1 the Department is developing multiple cyber-hardened,
2 advanced, all-domain awareness for our command and control
3 architectures that will enable timely and accurate decision-
4 making to address emerging threats. And we will continue to
5 develop capabilities for left-of-launch and missile defeat
6 that will play an important role in effectively countering
7 limited missile attacks.

8 With regard to cooperation with our allies and
9 partners, engaging and working with our allies and partners
10 to enhance our collective missile defense efforts is a core
11 focus area of the Department. The Indo-Pacific is a model
12 for cooperative missile defense efforts with strong allies,
13 including Japan, the Republic of Korea, and Australia. NATO
14 continues to form the backbone of European joint and
15 combined operations, and in the Middle East, U.S.-Israel
16 missile defense collaboration demonstrates the mutual
17 benefits of technology sharing with our allies and partners,
18 along with our efforts to strengthen missile defense
19 cooperation with key Gulf cooperation countries.

20 Additionally, my office leads a series of dialogues that
21 share information on regional and global missile threats.

22 In conclusion, as the Department prepares its strategic
23 review, I can assure members of this committee that we are
24 steadfastly committed to the key missile defense missions
25 and priorities, including working with allies and partners

1 to meet the challenge of growing missile threats in a cost-
2 effective manner that strengthens regional and strategic
3 stability.

4 I look forward to your questions. Thank you.

5 [The prepared statement of Ms. Tomero follows:]

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Senator King: General VanHerck.

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1 STATEMENT OF GENERAL GLEN D. VANHERCK, USAF,
2 COMMANDER, UNITED STATES NORTHERN COMMAND AND NORTH AMERICAN
3 AEROSPACE DEFENSE COMMAND

4 General VanHerck: Chairman King, Ranking Member
5 Fischer, and distinguished members of the committee, it is a
6 privilege to testify before you again today. I am honored
7 to serve as the Commander of the United States Northern
8 Command and North American Aerospace Defense Command, and I
9 am grateful to appear beside my colleagues here as they are
10 crucial partners in homeland defense.

11 The United States Northern Command and NORAD separate
12 commands, yet work seamlessly to accomplish the critical
13 mission of defending North America against all threats,
14 whether posed by our competitors, natural disasters, or a
15 pandemic.

16 We are in an era of renewed strategic competition, and
17 this time we are facing two nuclear-armed peer competitors,
18 both focusing on circumventing our homeland defenses.
19 Additionally, North Korea's recent unveiling of a new
20 intercontinental ballistic missile, capable of threatening
21 North America and Hawaii, is means to constrain options in a
22 crisis.

23 I remain concerned about my ability in the near future
24 to defend the homeland. Potential adversaries continue to
25 develop capabilities to hold our homeland at risk, from all

1 vectors, all domains, kinetically and non-kinetically. They
2 seek to exploit a perceived gap between our nuclear
3 deterrent, which I believe is the foundation of homeland
4 defense, and our conventional homeland defense capabilities.
5 To close this perceived gap, we must accelerate efforts to
6 transform our culture to think and operate globally and
7 digitally across all domains, and factor homeland defense
8 into every strategy, plan, force management, force design,
9 acquisition, and budgetary decision.

10 The United States Northern Command and NORAD are
11 aggressively pursuing a left-of-launch framework that
12 provides the President of the United States and the
13 Secretary of Defense less escalatory options that increase
14 decision space and deterrence in strategic competition, vice
15 end-game kinetic defeat and conflict.

16 With the Missile Defense Agency leading the effort,
17 progress on the next-generation Interceptor is on the right
18 trajectory, but further delays will be detrimental to
19 defense and deterrence by denial capability. We must also
20 capitalize on globally layered, multi-threat detection
21 systems, such as over-the-horizon radar, hypersonic and
22 ballistic missile tracking space sensor, which can
23 adequately address both my capability and capacity concerns
24 of emerging threats.

25 Progress is also being made on the information

1 dominance capabilities within the Department. The
2 additional capabilities USNORTHCOM is pioneering, as
3 demonstrated in the latest Global Information Dominance
4 Experiment, are focused on prying data from existing
5 stovepipe networks to enable all-domain awareness. By
6 ingesting data streams into cloud-based architecture, where
7 the power of artificial intelligence and machine learning is
8 unleashed, we can drastically reduce processing time across
9 the globe and rapidly enable information dominance and
10 decision superiority, all 11 combatant commanders endorsing
11 and field these capabilities as soon as possible.

12 United States NORTHCOM and NORAD will continue to lead
13 and accelerate the Department's digital transformation
14 through development of global, all-domain awareness,
15 sensors, and networks, data standards, and infrastructure to
16 share information quickly and efficiently. In doing so, we
17 will improve our ability to defend the homeland against
18 emerging threats, including improved ballistic missiles,
19 low-altitude hypersonics, and long-range, low-radar, cross-
20 section cruise missiles.

21 NORTHCOM and NORAD take solemn pride in executing the
22 Secretary of Defense's top priority by standing watch to
23 defend our nation. I am grateful for the trust and
24 responsibility you place in me as the Commander of NORTHCOM
25 and NORAD. Thank you, and I look forward to your questions.

[The prepared statement of General VanHerck follows:]

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1 Senator King: Thank you. General Karbler.

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1 STATEMENT OF LIEUTENANT GENERAL DANIEL L. KARBLER,
2 COMMANDER, U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/JOINT
3 FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE

4 General Karbler: Chairman King, Ranking Member
5 Fischer, and distinguished members of the subcommittee, I am
6 honored to testify before you today. Thank you, especially,
7 during the unprecedented health crisis of this past year for
8 supporting our servicemembers, civilians, contractors, and
9 their families, in your continued support to space and air
10 and missile defense.

11 I am here today as the Commander of the Joint
12 Functional Component Command for Integrated Missile Defense,
13 and as the Army's proponent for Air and Missile Defense, or
14 AMD, Forces and Capabilities. I am responsible for
15 providing General VanHerck the soldiers who stand ready to
16 defend our nation from an intercontinental ballistic missile
17 attack, as well as the soldiers who provide critical missile
18 warning to Army and joint warfighters.

19 As air and missile threats become more diverse and
20 numerous from adversaries worldwide, the Army AMD enterprise
21 continues to work hard to ensure our warfighters and our
22 homeland are protected.

23 I would like to take this opportunity to briefly thank
24 and highlight the mission accomplishments of our team of
25 nearly 3,000 soldiers, sailors, airmen, marines, guardians,

1 and civilians in the challenging COVID environment that we
2 continue to endure. During this past year, in support of
3 SPACECOM, STRATCOM, and NORAD/NORTHCOM, these outstanding
4 men and women provide the Army and Joint Force with
5 satellite communications, space situational awareness, and
6 missile warning defense, and protected our homeland 24/7,
7 365, from ballistic missile attack. Even in the pandemic
8 environment, they did not miss a beat.

9 To outline one of numerous examples of putting mission
10 first and how Army families have sacrificed during the
11 pandemic, members of our ground-based missile defense crews
12 adhered to 12 consecutive months of stringent measures
13 ensuring the uninterrupted execution of their mission,
14 including sequestering crew members from their homes and
15 families. Essentially, our missile defense crews lived in a
16 bubble throughout their operational rotations on this
17 essential, no-fail mission. While they and their families
18 reside in Colorado Springs, Colorado, and Fort Greely,
19 Alaska, the crewmembers were basically away from their
20 families for extended period of time.

21 A positive I have drawn from this pandemic is my daily
22 realization that I have never been more proud and thankful
23 for our greatest asset, our people. Every day I am awed by
24 their dedication and unwavering sacrifices to the nation. I
25 consider it an honor and a privilege to lead and serve

1 alongside them. The continued support of Congress is
2 critical to our ability to recruit, develop, retain, and
3 resource such a highly qualified and mission-ready team.

4 I look forward to addressing your questions. Thank
5 you.

6 [The prepared statement of General Karbler follows:]

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1 Senator King: Thank you very much. Admiral Hill.

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1 STATEMENT OF VICE ADMIRAL JON HILL, DIRECTOR, MISSILE
2 DEFENSE AGENCY

3 Admiral Hill: Good afternoon, Chairman King, Ranking
4 Member Fischer, and distinguished members of the
5 subcommittee. Thank you for your time today to discuss the
6 important topic of missile defense. For present budget
7 2022, MDA is requesting \$8.9 billion to develop and deploy
8 homeland defenses against the rogue state threat, improve
9 regional defenses against the existing and the emerging
10 threats.

11 The threat can be summed up, as Senator Fischer
12 mentioned earlier, much less predictable today, but they
13 come with countermeasures and multiple warheads, potentially
14 with nuclear payloads. The hypersonic and cruise missile
15 threats present high speeds and global maneuvering
16 challenges. So despite the pandemic restrictions, that
17 General Karbler mentioned now, we have advanced the program
18 on several fronts this past year, and I would like to walk
19 you through some of those.

20 From command and control and battle management, we call
21 that program C2BMC, we continue with our spiral upgrades to
22 integrate across the missile defense system, supporting the
23 combatant commands and the Services with tracking, queueing,
24 and discrimination data. "Discrimination" is our fancy word
25 for picking out the lethal object in the complex, and we

1 will come back to that in just a bit.

2 From a space-sensing perspective, improving our
3 detection and our tracking and discrimination, the
4 Hypersonic Ballistic Tracking Space Sensor, mentioned
5 earlier, that development continues with two competitive
6 awards, focus on an on-orbit demo in FY 2023, and we will
7 track dim boosting targets and we will track hyper glide
8 vehicles. And we need to do that soon so we can leverage
9 that capability in the INDOPACOM theater where we will first
10 put out our hypersonic defenses in the hypersonic missile
11 defense kill chain, and I will come back to that in just a
12 moment.

13 The other space capability I would like to talk about
14 is the Space-Based Kill Assessment, the SKA system. We
15 deployed that a couple of years ago. We have a full
16 constellation up. And what we are doing now is taking what
17 we see as the flashes when we get intercept and bringing
18 that to an operational hit assessment for the combatant
19 commander, specifically for General VanHerck, so that he can
20 control the homeland defense war.

21 Switching over to land-based sensors, it was mentioned
22 earlier the Long Range Discrimination Radar that we have up
23 in Alaska, that is being built now. We did have some
24 pandemic delays. The Clear Air Force Base closed. We had
25 radar equipment shipping there. We had to stop it and hold

1 it up. But the team stayed on path, building that radar,
2 and we have both panels completed this year. We are now
3 doing radiation, which means the radar is up and running,
4 doing low-power calibration, and we are going to learn a
5 lot. It started off at a very small-scale radar out in
6 Morristown, New Jersey. It is now at its full array size,
7 and we expect to have government acceptance by the end of
8 this year.

9 From a homeland defense perspective, we did not talk
10 much about GBI fleet reliability efforts, the Service Life
11 Extension Program, and I want to thank Congress for their
12 support there. You cannot have a weapons system deployed in
13 2004 and not maintain it, not take those rounds out of the
14 ground and upgrade them. We are doing that now, in
15 coordination with NORTHCOM and NORAD. Those missiles come
16 out of the ground, we change out the boosters, we update the
17 software in them, we update the seekers, we update the
18 threat libraries. That builds capacity and capability now,
19 so that we can close the gap between now and when we
20 actually deploy the first NGI.

21 What is also important about that is that hardware that
22 has been in the silos for all those years now becomes the
23 basis for the analysis that we do to determine reliability.

24 Last year when we had this conversation, it was purely
25 analytical based, because we did not have that hardware

1 available. So the Service Life Extension Program extends
2 the life of the current GMD fleet, increases its capability
3 and capacity, but also gives us the hardware ability to go
4 and really assess reliability, to build the confidence of
5 the warfighter.

6 We are also expanding at Missile Field 4. We had some
7 fallbacks during COVID, but we leveraged the waterways. We
8 have all 20 silos installed and now we are doing
9 integration.

10 The next test for GMD, the boost vehicle test 03, BVT-
11 03. We are developing the capability to not just fully burn
12 full kinematics of the GBI system, you fly it and only burn
13 up to the second stage. And why is that important? It
14 allows you to engage more and more into the battle space.
15 So there is a lot of activity going on with the current GMD
16 fleet that is providing the warfighter higher confidence,
17 higher capability for the future.

18 NGI development, that was mentioned earlier. We are
19 underway today with two competitive contracts, and I think
20 that is really important, the fact that the Department has
21 stepped forward to award those contracts and to have two
22 really great teams all the way through critical design
23 review. That is unusual, and I am telling you, it is going
24 to be hard. But we have the teams that are in place there.
25 They are perfectly OCI'd, so no conflicts of interest, as we

1 work that important competition. But what did we do that?
2 So that we can manage the technical risk in the program and
3 so that we can get to emplacement earlier than the
4 government estimate of 2028. And both of our contractors
5 are showing that they are going to come in earlier, and that
6 is good thing for General VanHerck and the warfighters.

7 Let me switch to the Aegis program, Aegis integrated
8 air missile defense, continues to advance. We are
9 delivering the SM-3 Block IB missiles on a multiyear
10 procurement, the Block IIA missile, which was a cooperative
11 development with Japan. I am very proud of what we have
12 done with that missile. We are in production now. The
13 Secretary of Defense just recently gave us permission to
14 take the first 11 rounds that were built out of RDT&E and
15 deploy those today. So that capability is out in the fleet
16 now, and through Global Force Management it will go to the
17 right places.

18 We are increasing our ability with sea-based terminal
19 -- I will talk about that in just a second -- and continue
20 improvements within the combat systems on the ships and with
21 the missiles in total alignment with the Navy.

22 FTM-44 was mentioned already, executed at the end of
23 last year. Another great COVID story. Another great
24 Department all-hands-on-deck story. We had it originally
25 planned in May. We executed in November, due to the

1 pandemic. We had to do a lot of deconfliction on the range.
2 Dan helped me keep the target in place on Kwajalein. That
3 is a tough area to have a target go into shutdown mode. But
4 we charged the batteries, charged the batteries. We made
5 sure that the ship crew stayed safe. We worked very closely
6 with the Navy. So the USS John Finn, a new construction,
7 integrated and air missile defense ship, could go out and
8 execute that mission. That same ship participated in the
9 last GMD test and tracked the ICBM.

10 So we are all about risk reduction, making sure that we
11 do things right, and that was a threat-representative
12 target. It was a defense-of-Hawaii scenario, from North
13 Korea to Hawaii. That is what it is. If you look at the
14 geography, that is what we did. So that was a threat-
15 representative, approved by DOT&E. Worked very closely with
16 the intelligence community to ensure that we were threat-
17 representative and that we were testing like we fight.

18 Let me shift out to Europe, Aegis Ashore Poland. This
19 has been a tough one. For the last couple of years we have
20 told you we were at 90 percent construction completion.
21 Today I going to tell you we are at 90 percent or more
22 construction completion. But the great news, within the
23 last couple of months, through the pandemic, you saw that in
24 Europe, we managed to raise the four spy radar rays, put
25 them in place as a forcing function to construction. We

1 also put up the fire control director. That is really
2 great. Now we are ready to do install and checkout for the
3 Aegis Combat System. Very important work.

4 We also took the Aegis Combat System out of the CONEX
5 boxes they had been sitting in for 2 or 3 years, and we ran
6 full digital signal analysis on it to make sure that that
7 system works, and we are going to upgrade that system to
8 make sure there are no obsolescence. We are in tight
9 coordination with the Army Corps, and Aegis Ashore Poland is
10 on track to complete its construction.

11 A little bit on Aegis Sea-Based Terminal. That is the
12 first regional hypersonic missile defense capability that is
13 deployed with the aircraft carrier strike groups today, and
14 it is important that we have that capability now, because
15 the hypersonic threat is there now. What we want to do is
16 move further back into that trajectory, engage earlier, make
17 the terminal defense even better. And so the glide phase
18 interceptor is under acceleration in the PB 2022 budget, and
19 that is an important capability for the country. It ties
20 right into HBTSS. Ties right into the land-based sensors
21 and sea-based sensors that can give us the fuse track that
22 we need to take a hypersonic maneuvering capability out in
23 the glide phase, and then we hit it again in terminal.

24 Let me switch to Guam. PB 2022 includes funds for the
25 initial development of a survivable and operationally

1 effective IMD for Guam, and those capabilities that I have
2 talked about, regional from Aegis, and what I am going to
3 talk about in just a second in THAAD, are all part of that
4 architecture consideration today, and we are working that
5 hard so that we can come forward and tell you exactly what
6 we are going to do on Guam. Staying very close to
7 INDOPACOM.

8 THAAD, we have continued the Interceptor procurement,
9 production, and training support, and we are developing the
10 capabilities to address the evolving threat in very close
11 coordination with the U.S. Army. THAAD and Patriot
12 integration, we have been working that for the last 2 or 3
13 years. We completed the first phase, where we separate the
14 launchers from the THAAD battery for flexibility for the
15 combatant commander. We have done Patriot launch on remote
16 from THAAD data. Pretty impressive. Also flexibility for
17 the warfighter. And our next test this year is to control
18 the Patriot battery using THAAD. That may not all make
19 sense to you but what that means is full flexibility where
20 the combatant commands need it, and the Army will be working
21 its urgent material release once we finish that test.

22 So I will wrap up by saying a little bit about
23 technology, investing in innovative and disruptive
24 technologies to address the emerging threats, including
25 regional, layered hypersonic and cruise missile defense

1 capabilities. Space sensors, land- and sea-based sensors,
2 networked through the Command and Control Battle Management
3 System set the stage for hypersonic and cruise missile
4 defense capabilities, and thank you. I appreciate
5 everything that you do for this committee, and thank you for
6 your time today.

7 [The prepared statement of Admiral Hill follows:]

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1 Senator King: Thank you very much, Admiral. This
2 subject gets more and more complicated the more we get into
3 it, because I think when we talk about missile defense it is
4 important to emphasize we are not only talking about Fort
5 Greely and Vandenburg. We are talking about THAAD, Patriot,
6 and Aegis.

7 You have to understand that from the point of view of
8 this committee, one of the important considerations we have
9 is opportunity cost. This is a tight budget year that we
10 are looking at, and so when you spend money on one thing,
11 that means you do not have money to spend on something else,
12 and that is something that we have to look at.

13 You mentioned something very important, and that is we
14 are developing hypersonic defense. Could you expand upon
15 that, being aware that this is a nonclassified setting? Can
16 we defend a carrier against a hypersonic glide missile
17 today?

18 Admiral Hill: We have terminal capability today.

19 Senator King: "Terminal" means in the last stages
20 before it hits the ship.

21 Admiral Hill: And that is typically where you will
22 start on taking on that kind of threat. It happens to be in
23 the hardest environment. You are in the atmosphere. You
24 are maneuvering. But we do have that capability deployed
25 today, and we are continuing to improve it.

1 Where we need to go is to take it out in that glide
2 phase, and that is the Glide Phase Interceptor that you will
3 see in the PB 2022 budget.

4 Senator King: We are all talking about hitting bullets
5 with bullets. What is the role of directed energy, and are
6 we putting sufficient resources into directed energy as an
7 alternative, and frankly, a cheaper alternative, and perhaps
8 a more effective one to deal with a maneuverable incoming
9 missile?

10 Admiral Hill: Thank, Senator. That is a very tough
11 one to discuss in this environment. I would love to come
12 see you on that one. There are initiatives there. I just
13 can't talk about here, at this session.

14 Senator King: Thank you. It is being considered.

15 Admiral Hill: Yes, sir.

16 Senator King: General VanHerck, I think you used a
17 term, and I wrote it down. You talked about "prying the
18 data" out of someplace. Am I correct? Is that what you
19 said?

20 General VanHerck: Chairman, that is correct. I did
21 say that. There are lots of data from domain awareness
22 sensors around the globe that all too often is not shared to
23 develop a globally integrated picture that would give us the
24 ability to get further left and give decision space to our
25 senior leaders.

1 Senator King: I completely agree, and as you know,
2 Goldwater-Nichols was a landmark statute which led us to
3 joint commands. But we do not necessarily have joint data
4 access and capability development. So I hope that is
5 something we might be able to address. But when one of our
6 generals says he has to pry the data out of another agency
7 in order to do his job, I think that tells us we have got a
8 problem we should address.

9 General VanHerck: Chairman, I am encouraged with the
10 Department. The Secretary just signed the Joint All-Domain
11 Command and Control Strategy. We are moving forward going
12 down that path. I would also say that we are going to have
13 to look at policy and laws as well, especially within the
14 intel community, of sharing data to ensure that we get a
15 full global picture.

16 Senator King: Admiral, are you persuaded that the
17 accuracy and the ability of the Ground-Based Interceptors is
18 sufficient to justify the cost? Let me put it in a more
19 difficult question. Which would you rather have -- the
20 Ground-Based Interceptors or five additional Aegis
21 destroyers?

22 Admiral Hill: Well, for the ballistic threat, the GBIs
23 today and the NGIs tomorrow go after that threat. They are
24 spec'ed for that. NGI, as you know, it has got a hard
25 requirement on it. It is to cover all 50 states. That is

1 why it is a 50-foot missile and 50-foot in diameter. It has
2 got a hard requirement on it. I would rather have more GBIs
3 and NGIs against that threat.

4 The Aegis ships and what they do, for a totally
5 different mission, and they are multi-mission ships. They
6 have a lot of different missions that they are excellent
7 for.

8 Senator King: But THAAD, Aegis, and Patriot have a
9 higher success rate, do they not?

10 Admiral Hill: The way the success rate was mentioned
11 earlier, it has always entertained me. If you have a
12 failure in a program, you are going to learn from that
13 failure. Talk about it all the time. You learn from your
14 failures, right?

15 Senator King: Yeah, but if there is an incoming
16 missile from North Korea and we miss it, learning from the
17 failure is not going to make people feel better.

18 Admiral Hill: Absolutely not. And so that is why,
19 over time, you want to improve the program, and then your
20 math really needs to take a look at the current
21 configuration that is in the ground, and the current
22 configuration that has been tested against realistic
23 targets. If you add up failures from 1998 into the number,
24 of course you are going to have a lower reliability number,
25 using that right-world information. I will tell you that

1 the reliability is much higher, and I think that the
2 conference of the warfighter is based on that.

3 Senator King: Final question, and my wife says I say
4 "finally" too much and it gets people's hopes up.

5 [Laughter.]

6 Senator King: But in this case, final question. You
7 heard Mr. Panda talk about more transparency, clarity on
8 testing, clearer reporting on what exactly the targets are.
9 I could be in a classified setting, but would you support
10 that suggestion, because it seems to me we have a
11 responsibility, as the people who are funding and using the
12 taxpayers' money, to ensure that these things are going to
13 work. So would you support additional clarity and
14 transparency with regard to testing?

15 Admiral Hill: Absolutely, Senator. If someone has got
16 a security clearance I will happily talk to them about that.
17 And I will tell you, we have got a great test record that I
18 am very proud of. And you can't just look at live fire.
19 That is one shot, right, in a broad battle space. We have
20 got to look at the ground test data. That is where your
21 real numbers and your statistics come from. So I would be
22 happy to show that to anybody that is interested and has the
23 appropriate clearance.

24 Senator King: I think that is something we can follow
25 up on. Thank you very much.

1 Admiral Hill: Yes, sir.

2 Senator King: Thank you all. Senator Fischer.

3 Senator Fischer: Thank you, Mr. Chairman. Admiral
4 Hill, a number of news reports have indicated that the
5 government of Israel plans to submit a request for
6 additional assistance so that they can replenish their Iron
7 Dome system following the recent conflict that we have seen
8 there with Hamas. Has the Department received such a
9 request?

10 Admiral Hill: I am going to defer that question over
11 to Policy, but before I do that I will say they are a great
12 partner. We work very closely with Israel on all layers of
13 what they do. But beyond that, in terms of the emergency
14 acquisition, I will send that over to Policy.

15 Senator Fischer: Ms. Tomero, it is good to see you
16 again. You are going to be a regular here, I think, from
17 now on.

18 Ms. Tomero: I am looking forward to it.

19 Senator Fischer: Thank you so much for being here.
20 Can you answer that question for me, please?

21 Ms. Tomero: Yes, absolutely. The Department is
22 working that request, and as Admiral Hill said, we look
23 forward to working very closely with Israel as one of our
24 closest partners. And so the Department is working that
25 request. What I can do is, because it crosses over several

1 departments within DoD, to come back to you and give you
2 more detail.

3 Senator Fischer: Okay. I would like to know if it is
4 going to be a request for supplemental appropriations or if
5 it is going to reprogram resources.

6 Ms. Tomero: I think if you could allow me to come back
7 and give you a better answer for the record on that. But
8 again, the Department is looking at that request for \$1
9 billion.

10 Senator Fischer: Okay. Great. Thank you. Also, what
11 are the Department's plans with respect to conducting a
12 missile defense review? Has that begun? What organizations
13 are involved in it? First of all, are you going to have a
14 missile defense review, and what is the process going to
15 look like on that?

16 Ms. Tomero: Thank you, Senator. We are planning to
17 start a missile defense review imminently, in the next few
18 weeks, and look forward to working across the Department
19 with Admiral Hill's organization, with General VanHerck in
20 NORTHCOM, with the acquisition community within the
21 Department. And so it will be done in a coordinated way
22 across the Department, and we are planning to start very
23 soon. And we will look at the threat and the changing
24 security environment, you know, how do we improve and have
25 effective and affordable missile defense for both the

1 homeland and regional defense.

2 And so as I mentioned in the opening remarks, we will
3 do that as part of the National Defense Strategy, and it
4 will also feed into our integrated deterrence review.

5 Senator Fischer: Will it be standalone?

6 Ms. Tomero: That decision has not been made yet.

7 Senator Fischer: Okay. Section 1683 of the FY 2017
8 NDAA requires the Department to designate a single entity as
9 the lead acquisition organization for defending the homeland
10 from cruise missiles. To my knowledge, that designation has
11 not been made. Can you update us on what the status of that
12 is?

13 Ms. Tomero: Yes, Senator, you are correct. That
14 designation has not been made, and is still being worked
15 within the Department.

16 Senator Fischer: Okay. Thank you. Do you think we
17 need it? Do we need that designation?

18 Ms. Tomero: This is something that the Department is
19 still looking at, and I would ask for your indulgence in
20 allowing me to look across and work with my colleagues on
21 what the best way forward on this is. And I know the
22 previous administration also did a lot of work on this too.

23 Senator Fischer: I am going to put General VanHerck on
24 the spot, and Admiral Hill. What do you think? Do we need
25 a designation like that?

1 General VanHerck: Senator Fischer, I do believe it
2 would be best to have a single entity designated within the
3 Department for cruise missile defense of the homeland.

4 Senator Fischer: Thank you. Admiral?

5 Admiral Hill: Great, great question. I also agree we
6 need a single agency involved.

7 Senator Fischer: Good. Thank you. I will try to get
8 another one in. Admiral Hill, does the budget support
9 delivery of the next-generation Interceptor in 2028, and can
10 you describe the life extension program MDA has developed to
11 ensure the current Interceptor fleet remains viable until
12 NGI is deployed?

13 Admiral Hill: Thank you, Senator. When I mentioned
14 the Service Life Extension Program earlier, based on
15 congressional support there we kick-started that program,
16 working very closely with General VanHerck and his team.
17 And that is going really well, and it will increase capacity
18 and capability. I mentioned that we will have the old
19 hardware that we can assess, and our assessments'
20 reliability are going to bump up, and we are going to have a
21 lot more confidence in that.

22 So what we are doing -- I do not like to live off of
23 plus-ups. I always appreciate when Congress does that, but
24 then now we are committed to include that in the budget, so
25 you will see us including that in PB 2022 as we move

1 forward. And that PB 2022 look into NGI, absolutely. We
2 are in a good place with both contractors moving out to beat
3 the government estimate of first emplacement in 2028.

4 That is going to come to the left. I am going to stay
5 very close to General VanHerck. I am going to stay very
6 close with all the stakeholders in the building, because
7 what that means is flight testing will happen earlier, which
8 means we are going to prepare those threat-representative
9 targets and then we will be ready to go.

10 Senator Fischer: Good to hear. Thank you.

11 Admiral Hill: Yes, ma'am. Thank you.

12 Senator King: Senator Rosen, via Webex.

13 Senator Rosen: Well, thank you, Chair King and Ranking
14 Member Fischer, for holding these hearings today. I would
15 like to thank all witnesses for their service and for
16 testifying, and General VanHerck, always great to see you
17 and spend some time with you like we did yesterday. That
18 was wonderful.

19 I would like to go right into some missile defense
20 cybersecurity issues. As MDA works to rapidly deploy
21 missile defense systems to, of course, stay ahead of
22 threats, I am concerned that we may not be taking potential
23 cyber vulnerabilities seriously enough before we field new
24 systems, when the 2019 Missile Defense Review software is
25 mentioned, only once, and even more alarming, GAO's May 2021

1 report highlights that none of MDA's 17 operational
2 cybersecurity tests planned for fiscal year 2020 were
3 conducted, and that cybersecurity testing since 2017 has
4 revealed several vulnerabilities.

5 So Admiral Hill, in light of recent significant
6 cyberattacks, of course I do not have to tell you what they
7 are out in the public space, what steps is MDA taking to
8 address cybersecurity vulnerabilities, and are you
9 conducting cybersecurity testing on all deployed and planned
10 capabilities?

11 Admiral Hill: Yes, thanks, Senator Rosen. Part of the
12 difficulty of cyber testing with missile defense systems is
13 often you have to creep into the networks that are
14 operational. So it does require a lot of coordination with
15 the combatant commands. And when you look at what it takes
16 to execute a cyber test in a pandemic, no surprise that
17 there were delays in executing those test in 2020. But I
18 will tell you, we have conducted a number of adversarial
19 assessments. Those are called the AAs. We have also moved
20 out and done the PCO, which is the persistent cyber
21 operations. We have an agreement with DOT&E to start
22 executing that this next year, so we have the team in place
23 and ready to roll.

24 I absolutely agree with you that it is something we
25 should worry about. When you look at a system as networked

1 as missile defense is, 18 time zones, tying all the sensors
2 together, fusing data, absolutely. I want to know where
3 those vulnerabilities are, so when we execute those tests we
4 take action on them. You can see it in our budget exhibits.
5 You will see cybersecurity across every single element of
6 the missile defense system, and you will see that we are
7 martialing the best people on the planet to execute those
8 adversarial assessments and the persistent cyber operations.

9 Senator Rosen: Well, I appreciate that, and it is a
10 large operation. It is difficult to test. I would argue
11 that a lot of those tests are also done remotely, in the
12 privacy of offices. As we do some of those treat
13 assessments it is important that we get back on a regular
14 schedule, because the complexity also means it is more
15 vulnerable, because there are many points of entry.

16 I would like to move on now and build on Senator
17 Fischer's question about the Iron Dome. So Ms. Tomero,
18 given the U.S. Army's acquisition, of course, of the Iron
19 Dome technology, what lessons do you think that you have
20 learned, or we have learned from the recent Israel-Hamas
21 conflict, and more specifically, are you concerned about the
22 ability of hostile actors to launch a massive barrage of
23 rockets designed to overwhelm these short-range missile
24 systems? And Ms. Tomero and General Karbler, you can both
25 respond. Ms. Tomero, you can go first, please.

1 Ms. Tomero: Thank you. Again, there has been a lot of
2 continuity and support for cooperative missile defense with
3 Israel and supporting Israel's ability and capacity to
4 defend itself, and we will continue to do so. And my
5 understanding is, according to Israel, their success rate is
6 very high.

7 Senator Rosen: Well, and maybe, General, you could
8 talk about the lessons learned, because we know, and maybe
9 we are still analyzing what just recently happened, but
10 there are lessons to be taken from the most recent conflict.
11 So can you speak to that?

12 General Karbler: Ma'am, I had the opportunity to go
13 visit the Army soldiers who are out at White Sands Missile
14 Range as we field the new Iron Dome batteries. They are
15 training on the systems. I do not know specifically if the
16 lessons learned have been shared, but I know that the
17 instructors out there, as they go through their
18 certification and training, are providing threat-
19 representative scenarios to those soldiers as they go
20 through their training. And we expect that that first
21 battery will be ready for deployment at the end of September
22 of this year.

23 Senator Rosen: Thank you. I appreciate that. I have
24 toured those batteries myself, and they are quite
25 impressive, and I think there will be a lot of things that

1 we learn, going forward.

2 I believe my time is up, Mr. Chairman. Thank you.

3 Senator King: Thank you, Senator. Senator Cramer.

4 Senator Cramer: Thank you, Mr. Chairman. Thanks to
5 all of our witnesses. I think all but one of my questions
6 has been already thoroughly discussed, although I will just
7 add that I look forward to an update on Israel's request for
8 emergency military aid as well, and more details regarding
9 that.

10 But I do have a question for you, General VanHerck, and
11 I really appreciated our time together, our discussions
12 about over-the-horizon radar, the importance of all-domain
13 awareness, and, of course, the hugely successful test of the
14 over-the-horizon radar at Camp Grafton a few years ago. And
15 I would just ask if you could further explain the importance
16 of over-the-horizon radar and how it increases the
17 capability to defend the homeland, and why you need the
18 resources, frankly, to fast-track some procurement?

19 General VanHerck: Senator, thank you. As we look at
20 our competitors and potential adversaries, they have
21 developed capabilities to hold the homeland at risk, below
22 the nuclear threshold. Those capabilities that they have
23 developed now are extremely long range. So, for example,
24 Russian capabilities to launch cruise missiles now extend to
25 over Russia, that can threaten North America. They can also

1 do that from very far ranges, from our 2:00 towards Europe,
2 and the same thing in the Northwest as well.

3 Today's legacy North Warning System has served its
4 purpose and done well, and we are using a system called
5 Pathfinder to give us some additional capability. But, you
6 know, physically, the system cannot see over the horizon or
7 long distances. So over-the-horizon radar gives us the
8 capability to have domain awareness much further than we do
9 today, which increases decision space for our senior
10 leaders, and that is a top priority for me.

11 It is also my number one unfunded priority list, is to
12 fast-track the site survey, the additional development, so
13 that we can get this domain awareness capability of over-
14 the-horizon radar sooner.

15 Senator Cramer: I noticed that on the unfunded
16 priority list, which is why I asked the question, and given,
17 of course, my personal interest, what would be the next
18 steps then for testing and production?

19 General VanHerck: I would have to defer to the Service
20 on that one. I am not sure what those next steps are. For
21 us it would be to get the additional funding here, which is
22 \$25 million, to move forward to fast-track site development
23 and those kinds of things. As far as test of the actual
24 system, I would defer to the acquisition authority on that
25 one.

1 Senator Cramer: All right. Thank you. That is
2 everything, Mr. Chairman. Thank you.

3 Senator King: Senator Kelly.

4 Senator Kelly: Thank you, Mr. Chairman. Admiral Hill,
5 earlier we were talking about terminal phase, protecting the
6 aircraft carriers with an Aegis system. My understanding is
7 you talked about a terminal-phase intercept. Does that
8 change? I mean, this is a relatively new capability. I
9 assume SM-2, SM-6 --

10 Admiral Hill: SM-6 based.

11 Senator Kelly: SM-6 based. So to get this capability
12 with the Aegis system in an SM-6, does that change the
13 ability for the battle group, how it is going to operate,
14 the range of the Aegis destroyer/cruiser has to be from the
15 carrier? Does this have other operational considerations,
16 and how long have we been in this mode, because the
17 hypersonic threat, as we understand, is real.

18 Admiral Hill: Yes, sir, and it is probably a difficult
19 answer. I will say that, you know, all carrier strike
20 groups are very dynamic, so you are not going to tether a
21 destroyer to an aircraft carrier. The destroyer is going to
22 go do its business and it will stay in contact with the
23 destroyer, and the strike group commander will determine the
24 positioning of those ships.

25 Remember, I am the technical developer. There is

1 nothing that I see that causes a constraint on where the
2 destroyer or the cruiser might operate in order to protect
3 the carrier. It is just part of the other many missions
4 that that strike group is going to carry out.

5 Senator Kelly: And current the fire control solution
6 comes from the Aegis system. We were talking a little bit
7 about HBTSS and the test in 2023. Once that system is fully
8 developed, with regards to our carrier battle groups, does
9 this change the way the fire control solution -- does it
10 then come from the HBTSS system down to the cruiser to
11 launch the SM-2?

12 Admiral Hill: So the way Aegis works, and you sound
13 very familiar with this, is that the ship is going to
14 control the missile. And so typically for an organic
15 engagement where it is using its own sensor, it is going to
16 drive the missile, because you want to give updates to the
17 missile. When you have got a maneuvering target there is a
18 lot of uncertainty in that flight path. And so the help
19 from the larger, smarter ship to the smaller, less capable
20 sensor on the front end, you want to drive that missile to
21 get to the collision, or get it within what we call "Region
22 R," within its lethal radius.

23 When you bring in offboard sensors, which is a proven
24 fact with Aegis, we have done launch on remote, which means
25 we are launching on that remote sensor, and we have done

1 engage on remote, where the ship never sees it with its own
2 organic sensors. It is just controlling the missile and
3 giving in maneuver commands as it is taking data from
4 another radar.

5 HBTSS will follow a very similar pathway. So being
6 able to see down from space, warm tracks going over warm
7 Earth, that is really tough science, but we have got that
8 licked. We have shown that we can do data on the ground.
9 That sort of capability gives us that global coverage. But
10 it is going to work the same way. That data will come down
11 and come through C2BMC to the ship, and then ship is driving
12 the missile based on what it is seeing from HBTSS. So it
13 does give you more dynamic maneuver within that larger
14 picture, but no big major change.

15 Now in the future, it would be great to launch the
16 missile from the ship and have a space asset take it over.
17 We are not there yet, so we are going to crawl, walk, run on
18 that.

19 Senator Kelly: All right. Well, I am interested to
20 see how the test goes in 2023.

21 Admiral Hill: Yes, sir.

22 Senator Kelly: General VanHerck, yesterday we were
23 talking a little bit about cruise missile defense of the
24 homeland, and in the \$247.9 million budget to support
25 development of hypersonic defense capabilities, I believe

1 there is about \$14 million in there, or there is a requested
2 \$14 million for cruise missile defense of the homeland.

3 So General, what progress can we expect to see if that
4 money is approved by Congress in the coming fiscal year?

5 General VanHerck: I believe that is money that he is
6 taking internally in the Missile Defense Agency, that was
7 not actually dedicated towards cruise missile defense, but
8 he is taking that. Is that correct, Admiral Hill?

9 Admiral Hill: That is correct. So I am not the
10 designated agent for cruise missile defense of the homeland,
11 but I recognize the need. That threat is real. We stay
12 very close with NORAD and NORTHCOM. And so we have learned
13 forward to put funding into the budget so we could help with
14 that architecture work, do the spectrum analysis, get the
15 radars in place. So it is our way to put the foot forward,
16 even though I am not the designated agent.

17 General VanHerck: I would point out, on my unfunded
18 priority list I do have a request for elevated radar here in
19 the National Capital region, which would give domain
20 awareness for potential cruise missile threats, much beyond
21 what we have today. It also gives a warning awareness for a
22 movement of senior officials and those kinds of things.
23 That funding is \$27 million.

24 Admiral Hill: And you will see that same issue in the
25 unfunded priority list from the Missile Defense Agency.

1 Senator Kelly: Thank you.

2 Senator King: Thank you, Senator Kelly. Senator
3 Sullivan, we are delighted you are here, and we reached a
4 consensus to close Fort Greely.

5 [Laughter.]

6 Senator Sullivan: Well, Mr. Chairman, I am glad to be
7 here, and I was actually watching the first panel, so I am
8 sorry I did not get down here in time. But I actually do
9 have a comment or two. I agree with Senator Fischer on
10 that, the one witness who was making the argument that
11 somehow the China-Russia nuclear modernization program was
12 driven in part by the GBIs at Fort Greely, I think, no
13 offense to our esteemed witnesses, was one of the more
14 ridiculous arguments I have heard in quite a while.

15 But, Admiral Hill, can you just mention -- it is not
16 just North Korea that we are looking at with regard to our
17 missile defense. It is other rogue nations. We have the
18 capability, given our location, with regard to rogue nations
19 like Iran, don't we?

20 Admiral Hill: Absolutely. So when I say rogue
21 nations, I mean North Korea and Iran. And so NGI and the
22 GBI fleet today was geared to protect us against North Korea
23 and Iran.

24 Senator Sullivan: Correct. And I also watched the
25 Chairman's discussion of deterrence, and I think it is

1 questionable whether Kim Jong-un is a rational actor. I
2 definitely think it is questionable whether the Ayatollah is
3 a rational actor. And I think it is the responsibility of
4 this Congress to make sure we do not place that bet on
5 deterrence. The whole idea is if either of them want to go
6 out in a blaze of glory, we shoot down all their missiles,
7 and then we destroy their countries. But we don't get
8 destroyed first. Isn't that the whole point of our missile
9 defense?

10 Admiral Hill: I will defer to Policy.

11 Senator Sullivan: We don't take the punch. We deliver
12 the punch, we parry the punch, and then we deliver the
13 punch.

14 Ms. Tomero: Right. There has been long consistency
15 that we have missile defense against a limited attack
16 against the homeland, but, you know, as --

17 Senator Sullivan: We shouldn't take the risk, though,
18 that Kim Jong-un and the Ayatollah are rational actors and
19 would be deterred by deterrence.

20 Ms. Tomero: Again, correct. If they were to launch a
21 limited attack against the United States, that is the
22 mission of missile defense, and we strongly support
23 continuing that --

24 Senator Sullivan: Let me ask another question. So the
25 history, unfortunately, of missile defense -- and I do not

1 want to be too partisan here, but typically Republican
2 administrations have supported it, Democratic
3 administrations have not. We made a good breakthrough in
4 this committee. In 2017, my bill, the Advancing America's
5 Missile Defense Act, had 20 Republican co-sponsors, 10
6 Democratic co-sponsors. So missile defense has become
7 bipartisan, which is really, really important to make it
8 sustainable.

9 But I will tell you, I am a little bit worried, and
10 Admiral Hill, here is why I am worried. There are some
11 Senators who are now starting to ask the question, "Hey, do
12 we need it at all?" That is their prerogative, but I think
13 that is indicative of kind of trying to back, hey, now that
14 the other party is in charge we are going to get rid of it.
15 I am also very concerned about the President's budget, which
16 reflects a 15 percent cut in the MDA's budget, notably 50-
17 plus programs that the MDA administers, over 70 percent are
18 expected to realize a cut, including the Ground-Based
19 Midcourse Defense program.

20 So, Admiral Hill, do you have concerns that the
21 requested level of funding will result in reduced readiness
22 and reliability to defend our nation?

23 Admiral Hill: Senator, thanks. Great question.
24 First, I will agree with you that missile defense should
25 always be a bipartisan issue.

1 Senator Sullivan: Yep, and we have made good strides
2 in that regard.

3 Admiral Hill: Yes, sir. For me and my team -- I
4 always call them the stellar team, and we have a noble
5 mission -- our mission is plain and simple: protect the
6 American people, protect our forward deployed forces and our
7 allies and friends. So straight on that.

8 Senator Sullivan: So the budget.

9 Admiral Hill: Yes, sir. So over to the budget. You
10 know, like all -- and we talked about this before you
11 arrived, sir, is there is a top-line reduction, and so we
12 had to prioritize. And I think we did it right. So when
13 you see our unfunded priority list, where we had to take our
14 risk was in production. So you will see at the top of that
15 list the need to procure more interceptors, because that is
16 where I had to take risk in order to not see the falloff of
17 availability, reliability of the current GBI fleet. In
18 fact, we make sure that program is rock solid and moving
19 forward with the Service Life Extension Program.

20 Senator Sullivan: But you would prefer not to have a
21 15 percent cut.

22 Admiral Hill: I always prefer to be able to have a
23 full balance of science, technology, development, testing,
24 and sustainment support to the services. Absolutely.

25 Senator Sullivan: Thank you. Mr. Chairman, can I ask

1 one final question -- I know I am running out of time -- and
2 it is one that I am going to depart a little bit from the
3 primary purpose of today's engagement. It will not surprise
4 you. General VanHerck, as the advocate for the Arctic in
5 terms of the military's capability, you may have seen the
6 Secretary of Defense and the DepSec, in their confirmation
7 hearings, said that they were going to fully resource the
8 different Service strategies, Arctic strategies. I remain
9 concerned that those strategies are not being effectively
10 implemented by the Army, Navy, and Air Force.

11 How do you see the Services implementing their
12 respective Arctic strategies as part of this budget's
13 mission, given your overall role as the Arctic military
14 advocate as the NORTHCOM commander?

15 General VanHerck: Senator, I think when I look at the
16 FY 2022 budget, I see an inching along in all of the
17 Service. I am encouraged they all have strategies, and the
18 Department has a strategy, and my strategy heavily relies on
19 the Arctic. But we did not move the ball very far down the
20 field this year in the budget, with regards to resourcing
21 the Arctic.

22 Senator Sullivan: Thank you. Thank you, Mr. Chairman.

23 Senator King: Thank you. Senator Tuberville.

24 Senator Tuberville: Thank you. General VanHerck, if
25 the NGI development is delayed, do we have a good backup

1 plan, or are we going to fall so far behind we cannot catch
2 up?

3 General VanHerck: Senator, there is not a backup to
4 NGI. As I said in my statement, I remain concerned about my
5 capability and capacity to defend against a ballistic
6 missile threat from DPRK, or even if Iran developed one, and
7 slipping longer than 2028 would increase my concern and risk
8 to be able to meet the mission I have been given.

9 Senator Tuberville: Thank you. General Karbler, have
10 you got anything to follow up on that?

11 General Karbler: Just with respect to I provide the
12 soldiers that do the missile defense mission. We train to
13 the threat scenarios. We work very closely with MDA through
14 software development, the testing, et cetera, so as the
15 threat evolves, as the software evolves, our soldiers stay
16 trained and ready for it.

17 Senator Tuberville. Thank you. Admiral Hill, for the
18 second or third year in a row our number one unfunded
19 priority is a defensive system for Guam. If our number one
20 commander and our number one command is saying that is his
21 number one priority, I believe the best offense is a good
22 defense, and you need both. In your opinion, would a
23 defense system for Guam save the American people money and
24 free up ships for the Navy?

25 Admiral Hill: Senator, thank you. You sound like a

1 coach.

2 [Laughter.]

3 Admiral Hill: Absolutely, right. So when I look at
4 the defense of Guam, and anybody looks at it, you have to
5 have a sensor architecture, you have the fire control
6 network, and you have to have weapons to protect it. If you
7 are going to base there, if you are going to leverage
8 offensive power and to power projection from Guam, you have
9 to protect it.

10 So yes, I believe that we do save money. If there was
11 a way for us to free up the ship station so we could give
12 those ships back to the maneuver force of the Navy, that is
13 what we want to go do. So we are looking at regional
14 system. We are in the middle of that study now, and as soon
15 as we have that architecture laid down we will come and see
16 you.

17 Senator Tuberville: How many ships does it take,
18 moving in and out, to protect?

19 Admiral Hill: So generally, if you are going to have
20 one station, you are going to need four ships. You have got
21 one coming, you have got one going, you have got one in the
22 training cycle, and one under repair.

23 Senator Tuberville: Wow. Does NGI involved with the
24 threats we are seeing build from North Korea and other
25 malign actors, will we be prepared?

1 Admiral Hill: With NGI I believe we will be prepared,
2 and I think the reason why, if you take a look at what the
3 intelligence sources tell us, the first intelligence, we
4 know that those threats are not going to just be unitary,
5 single-shot devices. They are flying with countermeasures,
6 they are flying with multiple re-entry vehicles, multiple
7 maneuver vehicles. So the NGI answer to that, and having
8 two companies, two great American companies, moving forward
9 and competing against each other to beat the timeline and to
10 reduce the risk in the program, we are going to come forward
11 with a capability that has multiple warheads on it, that can
12 reduce the shot doctrine.

13 That is our goal. I want to make the job for General
14 VanHerck and his reliefs downstream much easier, to where
15 they do not have worry about numbers of missiles in the
16 arsenal, that they have the capability they need to take on
17 what is coming at us. And we know, by looking at the threat
18 projections and where they are going, that we have got to
19 take on that higher complexity threat.

20 Senator Tuberville. Thank you. That is all.

21 Senator King: I want to thank you all very much.
22 Thank you for your service and for your dedication to this
23 complex, difficult, and important mission. Thank you for
24 your testimony here today, and I will make the same
25 statement I did to the prior panel. If there are thoughts

1 that you have that you think would be helpful to us, please
2 supply them to the committee between now and the beginning
3 of next week.

4 Thank you again all for your service, and we will look
5 forward to working with you in the defense of our nation.

6 Thank you. The hearing is adjourned.

7 [Whereupon, at 6:07 p.m., the subcommittee was
8 adjourned.]

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