



**CENTER FOR STRATEGIC AND
INTERNATIONAL STUDIES
MISSILE DEFENSE AND U.S. NATIONAL
SECURITY**

**(AS PREPARED)
TUESDAY , 19 MAY 2014**



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Thank you Dr Hamre for that kind introduction and for the invitation to speak today.

It's great to be here at CSIS to provide an update on where our thinking is and where our progress is on missile defense.

...including national ballistic missile defense, regional ballistic missile defense, and cruise missile defense.

I know that for the most part this is a technically savvy audience that is knowledgeable on this topic.

And I suspect there are a few old friends of mine, very knowledgeable friends, mixed in among the crowd to boot.

I'd like to start by putting out two thoughts as a baseline for our discussion.

The first is that we recognize two key pillars of deterrence, namely denying an adversary's objectives and imposing costs on that adversary for its aggressive acts.

Missile defense is clearly about the former.

We want potential adversaries to know that not only is there a price for attacking us or our friends, but also that their attack may not succeed in the first place, resulting in pain . . . but no gain.

The second baseline thought is that we believe any sensible nation has to prioritize its investments in defense along some kind of strategic framework.

If we don't do this in a sensible way, we will end up with a cacophony of demands in an area of declining means.

This has implications for our missile defense investments.

The operative word here is prioritize, which is something this town hates to do, because it means there are winners and losers.

Some would suggest that this framework should be around prioritizing regions. I say that serious threats come from every region, so this doesn't work so well.

Others would suggest that this framework be around simply prioritizing capabilities.

Yes, we need to do that, but they don't prioritize themselves. Capabilities are ways, and we cannot prioritize them before we prioritize our ends.

No, the Chairman and I, and an increasing number of people in our department, believe our investments must be prioritized along the lines of what it is we're being asked to protect.

Some of you have heard me speak of this before. Some things are more important than others. Call them whatever you want, we would call them national security interests.

We need to look inside each one at the threats to that interest and whether we have them properly mitigated.

It stands to reason that we need to ensure we take care of the highest ranked interests first.

Compromise in an era of decreasing means will have to come in lower interests.

And of course missile defense falls into various levels on that spectrum.

At the top of our list of national security interests is the survival of our nation and at the top of the list of threats to that interest is a massive nuclear attack from Russia or some other high end adversary, like China.

This is about existential attacks, attacks that are extremely hard to defend against and because we prefer to use the deterrent of missile defense in situations where it has the highest possibility of being most productive. We've stated that missile defense against these high end threats is too hard and too expensive and too strategically destabilizing to even try.

Even though our Russian interlocutors refuse to believe us on this, it has the very great virtue of actually being true. No, we'll use cost imposition to deter Russia by keeping all three legs of our nuclear deterrent strong and our nuclear command and control system robust.

But we do have other interests.

What we call "limited missile defense" falls squarely within the next security interest in line, namely our determination to prevent catastrophic attacks on our nation.

The number of states trying to achieve that capability is growing, not shrinking with our most immediate concern being North Korea, because they're closest in terms of capability, followed by Iran.

A robust and capable national missile defense is our best bet to defend the United States from such an attack.

Which is why the Ground-based Midcourse Defense program, will remain our first priority.

In a shrinking defense budget, this system will be accorded the highest priority within the missile defense share of the pie.

Further down the line are other global national security interests, including support for our allies and partners, as well as protecting American citizens around the world, including our own troops, wherever they may be present.

Thus, we also place a good bit of emphasis on regional missile defense, closely cooperating with a number of key partners in this area.

But in a world of declining budgets, it's likely we'll come to rely more on those partners to resource their own missile defense systems.

I wanted to get that out, because it is important context for where we will and will not do missile defense, and how we will prioritize our investments where we will.

Now, let me spend a little more time talking a bit more about each of these two interest-based priorities, defense of the homeland and regional defense.

Regarding the homeland.

We have to take the Iranian and North Korean threats seriously, even though neither nation yet has a mature ICBM capability, and both nations know full well they would face an overwhelming U.S. response to any attack. While we would obviously prefer to take a threat missile out while it's still on the ground, left-of-launch, we won't always have the luxury of doing so.

And because it's our policy to stay ahead of the threat, we don't want there to be any doubt about our commitment to having solid right-of-launch capability.

So it boils down to how many missiles we can knock down versus how many the threat can launch. And that's much more than a function of how many interceptors we have in the ground.

It's also a function of how the whole system works.

We in the military often say "quantity has a quality all its own."

Well, in the missile defense world, quality has a quantity all its own, and the leverage can be enormous.

If, for example, because of system improvements, we only have to shoot half the number of interceptors per incoming warhead, then we can handle twice the number of inbound warheads.

That's why we're taking a lot of time and effort to improve the capability and reliability of our entire system.

The Missile Defense Agency has done a terrific job with this.

It's not easy to hit-to-kill at the kinds of closure speeds we're talking about. But we've done it.

And it's hard to make advancements in such a program when it's so expensive to test the things you change in response to things you find wrong.

I give MDA great credit for understanding that, when you find a problem, you wring out the whole system. You don't stop at the first thing you find wrong, and you don't stop at the first possible fix to what you find wrong. MDA has done exactly that. They've taken their time. They've done it right.

In January 2013 they launched an improved CE II interceptor, not against an actual target, but simply to put it through its paces to ensure they had solved a problem with a previous shot.

It performed magnificently.

And then they sent it up against a real target a year ago ... and again it performed magnificently.

It was a very good shot in the arm for the program.

Based on the success of that shot, we were able to resume production of eight planned GBIs in the new and proven configuration.

That success also kept us on track to increase the GBI inventory by 14 GBIs, increasing the total from 30 to 44 by 2017 ...40 in Alaska and four at Vandenberg.

We currently have 8 CE-IIs emplaced, of which 4 have the improved design. And we're going to keep right on improving these missiles, and testing those improvements.

The next flight test of the GMO system will take place late this year. It will be another non-intercept test of a CE-II GBI to demonstrate the performance of alternate divert thrusters in a flight environment and to test end-to-end discrimination of a complex target scene through the GMO fire control loop.

At the end of calendar year 2016 we plan to conduct the first intercept flight test for the CE-II Block 1 GBI, which incorporates obsolescence changes and a new booster avionics package. This will be our first intercept of a true ICBM range target.

Should this intercept be successful, the plan is to deliver 10 CE-II Block 1 GBIs over the next year to achieve our goal of 44 GBIs by the end of 2017.

We're also making excellent progress with all three vendors on the redesigned kill vehicle, which we expect to flight test in 2018.

But improving the whole system is not just about interceptors. We have to take a holistic view and invest our limited resources as wisely as we can.

In this light, there's been much talk about installing an east coast missile field. Our environmental impact statement should be complete in the middle of next year.

However, the only reason to make this investment would be to provide the capability to shoot-assess-shoot, and we can only do this if we have the sensors we need in order to be able to do that.

We need to put our ability to see targets at the head of the line, so there's been no decision by the Department yet to move forward with an additional CONUS interceptor site.

Meanwhile, our current sites protect the U.S. homeland against the existing and projected ICBM threat from North Korea as well as the future Iranian ICBM threat, should it emerge.

Even though an additional CONUS interceptor site would add battle space and interceptor capacity, a decision to construct the new site would come at a significant material development and service sustainment cost.

So, while that site could eventually be necessary, in the near-term upgrading the kill vehicle on the GBI, improving our discrimination, and enhancing the homeland defense sensor network are higher priorities for improving protection against limited ICBM attack.

We have a lot going on in this area.

Working with our Japanese partners, we completed the deployment of the AN/TPY-2 radar in Kyoga-misaki in southern Japan to complement the radar currently operating in Shariki in northern Japan. We're grateful to our Japanese friends for their close cooperation in this area.

This radar and a new C2BMC capability will enhance the overall performance of both radars when operating in a mutually supporting AN/TPY-2 dual radar mode. We made a Technical Capability Declaration for the Kyoga- misaki radar this past December.

This will potentially relieve the need for AEGIS ships for tracking purposes in the Sea of Japan.

We're also continuing to operate SBX as needed in the Pacific to provide discrimination capabilities for CONUS and Hawaii defense.

An, we're planning to deploy a new long range discriminating radar for the Pacific region by the 2020 timeframe.

Finally, we're continuing to pursue greater use of space, UAS based technologies, and increased integration of existing sensor capabilities across the Command and Control Battle Management System in order to significantly enhance our missile defense discrimination capabilities in the future.

Now, I don't want to overlook cruise missile defense, particularly as it regards the homeland.

You might ask, if we choose to not invest the enormous resources required to defend against a massive Russian ICBM attack coming over the North Pole, then why would we care about cruise missile defense in the homeland?

Well, the element of surprise is nearly impossible with an ICBM attack, and we have time to react. We can't necessarily say the same for a cruise missile attack, which could be intended to take away our ability to decide on a response to an attack.

This is a key point, and is why homeland cruise missile defense is shifting above regional ballistic missile defense in importance, since defending our national leadership and its command and control capability is part of the "impose costs" leg of deterrence.

This has implications for budgets and for stationing of our assets.

We're devoting a good deal of attention to ensuring we're properly configured against such an attack on the homeland, and we need to continue to do so. This includes the JLENS test we're currently conducting at the Aberdeen proving ground, as well as other systems we are putting in place to greatly enhance our early warning around the National Capital Region.

We're also looking at changing out the kinds of systems we will use to knock down any cruise missiles headed towards our nation's capital. We're going to have to eventually extend this to the areas around our nation we believe are the most important to protect.

Turning to regional missile defense, there has been a massive proliferation in recent years of regional ballistic missile threats, including an increase of more than 1,200 missiles over the past five years. In fact, there are almost 6,000 known ballistic missiles in the world, and that's not counting Russia and China.

Within this proliferation, we see a number of technical advancements including advanced liquid-and solid-propellant propulsion technologies and missiles that are becoming more mobile, reliable, accurate, and capable of striking targets over longer distances.

Some can target ships at sea.

Many have shorter launch-preparation times and smaller footprints that are making them more survivable. Technical and operational measures to defeat missile defenses also are increasing. For example, several nations exercise near simultaneous salvo firings of short- and medium-range ballistic missiles from multiple locations to saturate regional missile defenses.

Against all this, not only have we brought our own missile defense capability to bear, in which we've deployed some kind of missile defense system in 10 different countries and now have 33 AEGIS ships capable of doing the missile defense mission, a number of which are on any given station at any given moment

We're encouraging our allies and partners to acquire their own missile defenses and to strengthen regional missile defense cooperation that will result in better performance than individual countries acting alone.

But I must tell you; this integration of capabilities is a challenge.

Our Combatant Commanders have found we need to continually be mindful of interoperability among the various sensors, shooters, and platforms deployed by the United States. Adding the systems and forces of our friends and allies adds a whole new level of technical and tactical challenges, which we are successfully addressing.

Before combined employment of missile defense systems can be brought to bear in any region, diplomats and warriors have a great deal of legwork to do. Regional architectures are not built in a day. Painstaking establishment of bi- and multi-lateral agreements forged through cooperation and communication will pave the way to more effective regional missile defense. It sends a clear message of deterrence to any would-be aggressor and offers assurance to international allies.

In this vein, the United States is literally working across the globe with our partners in bolstering missile defense against regional threats. Here are a few examples.

In the Middle East.

The United States is working with a number of our Gulf Cooperation Council partners on missile defense, including supporting purchases through Foreign Military Sales. In the Joint Statement coming out of his recent meeting with our GCC partners at Camp David, President Obama said, "The United States policy to use all elements of power to secure our core interests in the Gulf region, and to deter and confront external aggression against our allies and partners, as we did in the Gulf War, is unequivocal."

This includes missile defense.

MDA is currently executing an FMS case with the United Arab Emirates for two THAAD batteries and accompanying launchers, radars, and interceptors.

This calendar year, we will deliver the first THAAD battery to our UAE partners to begin New Equipment Training. And Saudi Arabia is in the process of upgrading its existing Patriot PAC-2 batteries to the PAC-3 configuration. Kuwait is purchasing Patriot PAC-3 batteries.

The United States also maintains a strong defense relationship with Israel, and our cooperation on missile defense has resulted in a comprehensive missile defense architecture. Israeli programs the U.S. has supported, such as Iron Dome, the David's Sling Weapon System, and the Arrow Weapon System, create a multi-layered architecture designed to protect the Israeli people from varying types of missile threats. Results for David Sling have been very successful to date.

In Europe.

United States continues its full engagement with NATO to develop a viable missile defense strategy, building on its commitment to the European Phased Adaptive Approach while also encouraging greater burden-sharing by NATO and non-NATO nations in the region.

MDA is on schedule to deliver Phase 2 of the European Phased Adaptive Approach by the end of 2015. Phase 2 will include deployment of Aegis Ashore to Romania with capability to launch both SM-3 Block IA and IB variants and upgraded versions of the Aegis BMD weapon system.

Required military construction, installation, integration and testing activities will be complete for technical capability declaration in 2015. We expect to hand Aegis Ashore over to the Navy in August for testing.

Just last year, we had a very successful test shot in Hawaii that demonstrated the functionality of the shore based Aegis Weapon System by verifying its ability to launch, control, establish uplink and downlink communication, provide guidance commands, and provide target information to a Standard Missile-3 Block IB guided missile.

And in an important next step, we should be conducting our first non-intercept test of the SM-3 IIA missile in the next couple of weeks.

We'll have another in November, and then two intercept tests next year. This is vital to Phase 2 of the EPAA. Currently, three of four BMD-capable ships, USS DONALD COOK, USS ROSS, and USS PORTER are stationed at Rota, Spain. The final ship to be permanently stationed in the Mediterranean to perform a BMD missions, USS CARNEY, will arrive later this year.

This program is on track, and our NATO Allies are also making significant contributions to the European missile defense mission through their purchase and deployment of BMD-capable systems and deployment in support of NATO missions.

And let me be clear once again, it is not the policy of the United States to build a ballistic missile defense system to counter Russian ballistic missiles, including in Europe. The Aegis Ashore sites in Poland and Romania are designed to counter long-range ballistic missiles that may be launched from other nations, outside of the Euro- Atlantic area, against our European NATO partners.

So let's lay that to rest, one more time.

The most helpful thing Russia-and China for that matter-can do is to persuade North Korea and Iran to drop their ballistic missile programs. But we do not see that happening any time soon.

And finally, in the Asia-Pacific.

We have a strong missile defense posture in the region, for both homeland and regional defense.

The cornerstone of our security and diplomacy has been our strong bilateral alliances with South Korea, Japan, and Australia.

Going forward, we will continue to emphasize the importance of developing regional ballistic missile defense systems. This is a very politically sensitive topic for several of our regional allies, but progress in this area would only increase our confidence in the face of persistent North Korean provocations.

During 2013's provocation cycle, it appeared that North Korea might conduct a test of a regional-capable ballistic missile that could potentially reach U.S. soil in Guam. In response, as many of you are aware, the U.S. Army did a magnificent job deploying THAAD battery to that island. There it remains, readily deployable if necessary to somewhere else in the world if needed, but in the meantime defending U.S. soil from potential threats.

And just a few weeks ago, we saw Pyongyang raving about a test of its submarine launched ballistic missile capability. Fortunately, they've not

gotten as far as their clever video editors and spin-meisters would have us believe. They are years away from developing this capability.

But if North Korea is eventually able to do so, it will present a hard-to-detect danger for Japan and South Korea as well as our service members stationed in the region. This only reinforces the importance of regional missile defense. With the unpredictability of the North Korean regime, we have to periodically reassess our posture within the region.

I know many of you are brimming over with curiosity over the potential for THAAD in the Republic of Korea. Of course we're interested in the potential for using this system to augment the defense of this important ally, including, our own troops who are there to help defend the ROK from attack.

It's a good system that would not pose a threat to any other nation in the region. But, I want to make it clear that we have not yet engaged in formal consultations with the ROK government about this. As always, we're respectful of our host nation's concerns and it goes without saying that the ROK will have to want this system in place or we simply won't put it there.

While we're on the topic of regional defense, I'd like to make the point that we need to keep our eye on the cost curves.

Chairman Dempsey really hit home on this topic a little more than a year ago, when he released his "Joint Integrated Air and Missile Defense Vision 2020."

The simple fact is that a THAAD, which costs around \$11M, could find itself being launched against a Scud missile that costs only \$3M. And

that's if we only launch one. This cost curve is working against us, and there are four things we can do about it.

First, we can keep the pressure on how much our own interceptors cost. It would be helpful in this regard to be able to buy them in economic quantities, but this is proving hard to do under increased budget pressure.

Second, we can continue our emphasis on developing the technologies required to hit ballistic missiles and their launchers left of launch. We are optimistic about a number of initiatives in this area, but we have a long way to go.

Third, we can expend R&D effort to find more cost effective ways of knocking down missiles that are in flight. In this regard I would mention the rail gun project and possibly directed energy.

And finally, there is no shame in passive defense, such as denial, deception, mobility and hardening. Our potential adversaries are doing these things, and there is no reason we can't as well.

Finally, I'd like to address three misconceptions that are out there regarding ballistic missile defense.

First, and most obvious, is the claim that our missile defense systems doesn't work, that we can't "hit-to-kill." Well, as I mentioned, FTG-06b was a real statement in this regard, and we continue to make improvements. Overall, GMO is 4 for 7, but there's nothing like having your most recent test a success. And we have an excellent track record with our regional systems.

To date, for our operationally configured interceptors, not development prototypes mind you THAAD is 11 for 11; Aegis BMD is 21 for 25; and the Patriot PAC-3 is 21 for 25. That's not bad, but we're determined to make it even better.

The second misconception is that it's easy for an adversary to employ ballistic missile defense countermeasures. To be sure, we will continue to do everything we can in order to improve our discrimination capability, but as hard as that job is, so is the challenge of deploying and employing countermeasures. If the enemy is confronting a layered defense system, whatever countermeasures work in midcourse might not work in terminal, or their terminal countermeasures may be destroyed in midcourse.

Test is critical to the success of any complex weapons system, and when it comes to missile defense countermeasures, our adversaries don't do much of it, which means they can't know how they perform. We've had our own extensive countermeasures program, and we've learned just how difficult it is to get that right. Countermeasures take up payload space and have weight considerations, so there's also a tradeoff.

Bottom line, it's not as easy as it might look on paper.

And the last misconception is the narrative that missile defense needs to be 100-percent effective to be successful, especially when nuclear weapons are involved. That is a simplistic argument. No system can achieve perfection. It would be hubris to believe otherwise.

So if deterrence does fail, we don't necessarily expect to stop every missile though, to be sure, we will try. Rather, the effective systems we have and are developing are intended to deter an adversary by injecting

considerable doubt into his mind regarding the effectiveness of his attack versus our likely response.

The enemy knows there will be a significant price to pay with a missile launch against the United States. The worst of all worlds for the enemy is that his attack is not only not effective, but it evokes a nasty response from us. Again, the two pillars of deterrence.

So I believe our missile defense enterprise is on an upward trajectory, if you'll pardon the quip, very healthy at the regional level though on a tough cost curve, and rapidly coming back into health for defense of the homeland.

I give great credit for all of this to VADM Jim Syring and his able staff and his predecessors.

Shooting a bullet with a bullet is not an easy technical problem to solve. It's even harder when you're under time pressure, still harder when the assets are expensive and difficult to test. And it's even yet harder in a turbulent political environment and budget uncertainty.

Yet we continue to make progress. Progress with our international partners. Progress in developing, testing, and fielding national and regional ballistic missile defense systems that are flexible, survivable, and affordable, and progress in investing in promising technology to ensure future systems will be capable of defeating the complex threats we expect to face in the future.

As we all know, the advantage in warfare shifts like a pendulum between offense and defense over time. In our limited way, we are trying to shift that pendulum in favor of missile defense.

As such, innovation is the leadership opportunity for this generation of missile defense practitioners -which is why your session this afternoon on "What's Next" promises to be so interesting.

So I thank you all for your interest in missile defense. I hope this discussion has been useful for you.

And I hope you come away convinced of our commitment to this important contribution to our security, and that we continue to make progress.

Tom, shall we get at a couple of questions?