042016 Missile Defense Advocacy Alliance Capitol Hill Briefing with Senator Daniel Sullivan (R-AK); Representative Tulsi Gabbard, (D-HI); and Tal Inbar, Head of the Space and UAV Center at the Fisher Institute for Air and Space Strategic Studies, on "Addressing the North Korean Ballistic Missile Threat to the United States"

MR. RIKI ELLISON: (In progress) -- and even more important, we have two Congressional members. I think they're going to be our emerging champions on this issue: Tulsi Gabbard and Dan Sullivan. They're going to speak from their public voice. As we've heard the last two weeks, or last week, the U.S. government speak on the subject, the U.S. military speak on the subject, the war fighter, the developer, MDA spoke on it, and our policy guys. So it's going to be a good ability to understand what our elected officials are saying on this subject matter and the urgency of it.

Today's agenda, we're going to start off with Tal on the threat. He's going to speak probably for about 15 minutes on that, and he'll have some time for some questions on that.

Then we'll have Representative Tulsi Gabbard who will come in here exactly at two o'clock. She's in votes right now. She will present from two o'clock to 2:15 p.m. There may be some time for questions with her at the end of her discussion.

Then from 2:15 to 2:30 p.m. we have Senator Dan Sullivan coming in, and he'll have an opportunity to answer questions. I think these are, again, great leaders. There's a Republican, there's a Democrat, so you're getting a different viewpoint. And I believe they are going to be one of our Congress' strongest leaders on this specific issue.

Today I think we all understand that the North Korean threat is probably the highest it has ever been since the inception of that country towards the United States. As you heard in testimony last week, we've had a reducing missile defense budget over the last eight years. We've had a 28 percent decrease in funding for our R&D in missile defense.

So we're in a situation where we're at risk, from our perspective, until these systems are fixed. For the defense of the U.S. homeland, it's all about increasing the probability of kill for those 30 GBI interceptors that are stationed in Alaska and in California. The best increase in probability of kill, besides the reliability of the actual warhead, is its ability to have sensors and discrimination, and being able to have eyesight on that object, then figure out where it's at in the threat cloud and get in front of it.

All of our missile defenses in the U.S., and most of them, except for our Patriots and so forth, are engage on remote capabilities. That means our interceptors in Alaska and in California are going to engage off a remote sensor. So it's highly critical that you're able to watch the object that's going to be separating from the third stage and in a cluster of debris, hundreds of pieces of debris, from where it's first seen as it spreads to maybe over a mile or two before it's hit. So you have to identify that specific object. As

you can understand, the countermeasures and the decoys and the development of that threat cloud will become more and more complex as nations get better at being able to do that.

So our country today, for the continental and North America, has three major early warning radars that can support the GBIs. They're in Clear, Shemnya and Beale. The U.S. also has two forward-based radars in Japan that can cover any tracks leading out of North Korea to the North American continent and to Hawaii. Where there is a sensor gap, and there is a sensor gap, is for Hawaii. Because of the curvature of the Earth, these radars can't see that far down and the shots can go underneath that type of sensor coverage. So we have to put a floating SBX radar out in the middle of the Pacific to fill that gap right now. That is a difficult challenge because of being able to be ahead of the threat when you put that out there.

So from our perspective, there is going to be a risk between now and when 2020 is in place when all those interceptors are re-tipped, replaced, and the next generation of interceptors are put in place, plus the LRDR up in Alaska going forward. That kind of gives you the background, and now I'm going to hand it off to our threat person. I've known Tal -- we've gone to Israel every year for the last decade, and I think he is one of the best in the world. His life and his country depends on his analysis on ballistic missile threats.

Tal, take it over and educate all of us.

MR. TAL INBAR: Okay, good afternoon everyone. It's a great honor and privilege to be here. Thank you for organizing this event. I'm going to represent myself today. Usually I do that, not only today, but usually. My views are not official Israeli government views, but sometimes they are.

I'm going to speak a little bit about North Korean missiles and their re-entry vehicles. We saw just recently, last month in March and the beginning of April was very hectic and active in North Korea with missile technologies. Now we can further assess their capabilities and threats not only on a regional basis, be it South Korea and Japan, but also the United States. I am going to focus further about the KN-08, or its original name from North Korea, the HS-13, which is a road-mobile ICBM, capable in the future of getting to the continental United States in about 30 minutes. So, I will give a little bit of technology assessment .

I had a little time last night conducting further modeling of the warheads, so you will be the first to see it today. Some future prospects, again, not only in terms of North Korea alone as a potential threat to the United States in its region, but also as a proliferators for technologies for ballistic missiles to other countries, and specifically Iran. When you are looking about on the North Korean's missiles, we can trace back some of its arsenal to Soviet origin B-8 Scud missiles, Scud-C or the SS-21, Soviet propelled tactical missile, and the BM-25 or Musudan, which in turn is the North Korean version, reversed engineered, and extended version of the R-27, which in turn is an old

Soviet sea-launched ballistic missile. So all of those technologies are Soviet-based.

But there is some original work conducted in North Korea, namely the Nodong missile, which was exported to Pakistan. It is, at the moment, carrying nuclear warheads in Pakistan on the Ghauri missile, and of course, to Iran where it is called the Shahab 3, the basic version. Iran embarked on an improvement program for this missile.

And, of course, we have the road mobile ICBM, we first saw it in April of 2012 during a military parade. I have to say I am only one of two people in the world that I'm aware of that said at the time that this a real missile and a real threat. Most of the community around the world, be it Europe or the United States, said that this is just a dog and pony show, or this is just a mock-up and so on. It is the real deal.

And by the way, I could trace back this missile prior to Kim Jong-un's current regime because we have some photographic evidence showing Kim Jong-il with the missile. That was in 2011, so at least since 2011, I suspect several years before, those missiles were already in North Korea's arsenal. The original missile is a three stage missile, liquid propelled missile, with now we know a nuclear warhead.

I took some measurements back in 2012 and came up with a set of technical drawings. I have to admit that today, four years later, after further evidence came from North Korea, that I was wrong in some of the measurements. But I was wrong in less than one tenth of a percent, so I was quite accurate at the time.

From the technical point of view, this is very interesting, the missile uses the technology, the Soviet-based technology, for the engines. Now we know that North Korea took two engines from the R-27 missile, which in turn by the way, is in possession by Iran as well. So they took a couple of engines, coupled them together, and it is a very capable engine and uses advanced fuel, so it could reach the United States.

But, we have to remember that there was no flight test of this missile as we speak. Just recently it was reported that North Korea failed trying to launch the Musudan, the BM-25 missile. We don't have any photographic evidence of this event.

But you have to take into consideration that in the eyes of North Korea you could mass produce missiles and introduce them into operational service without testing them completely in flight. Keep in mind that if Iran is conducting flight tests of the Shahab 3, it is a validation of the design for the Nodong. So not all the tests have to be conducted by North Korea from its own territory. And the same applies to Pakistan, where this missile is known as the Ghauri.

So in March we saw the visit of Kim Jong-un in some kind of missile depot, and we can see -- this is very blurred because this is at a magnification of some poster that was on the wall. But like I said, last night I conducted further work on this, and you can see this is my own work. You can see the nuclear warhead and the electronics package combined with it.

And you can see also that there is a very large volume which is empty at this time. So what North Korea could do in the future is either put a much larger nuclear warhead inside, which I believe to be a plutonium-based implosion device; but they could also in the future incorporate further elements to create a hydrogen bomb inside this type of warhead. There is plenty of room for this type of weapon.

We also saw Kim Jong-un with the nuclear device. You can see a lot of details about the missile itself. We can see exactly where this device is going to be fitted inside the warheads. You can see further details of the explosive (lens ?) to cause the implosion of this type of weapon. The geometry is like what we expected to see. Perhaps there is some influence from A.Q. Khan's work in Pakistan, which would not be a surprise because of the previous proliferation network that he was in charge of. You can see here that they planted this model inside the warheads.

That there are significant implications is quite explanatory, because the combination of long-range ballistic missiles and a nuclear warhead could inflict a devastating strike on every country that is within range. That the ranges exceed the region: North Korean, Japan and so on, region, means that they have in mind other targets. That (just may be ?) -- I want to refresh your memory.

Just a few years ago we saw Kim Jong-un with a map of the United States and the lines directed from North Korea to several bases inside the United States, including Washington, D.C. Just recently they showed a small short video showing a nuclear warhead exploding over the National Mall. I was there yesterday, and it's still there.

On March 15 of this year they also showed us the next generation of warhead designs. This is only the nose section of the second version of the HS-13 KN-08 missile. You can see this was an erosion and ablation test of the nosecone, admitting that they wanted to test and simulate the extreme heat of the re-entry phase of this missile after coming back from space, when it is fired to a long-range. And they put a Scud engine on top of this nosecone, and (looked at ?) the extreme heat and erosion on it.

You can see a lot more information came out from this experiment that we can analyze, not only the internal structure also that this test was conducted with very good results for the North Koreans, meaning that the shape was the same as at the beginning. So it won't affect the accuracy of the missile once fired.

What was also of great interest was to see the rear-end of the first stage of the HS-13, and you can see one of the two engines inside this type of missile. You can see the much larger re-entry vehicle for this modification of the missile, which was first shown on parade on October 2015. So a much larger warhead could be fitted inside.

Maybe, in the future, I don't know, but maybe in the future they could put some countermeasures inside, penetration aids, and maybe they will explore the MIRV potential of this missile. There is plenty of room to put many things inside this (case ?).

So from a technological point of view, all the designs look legit and authentic, like what we expected to see.

Another very interesting thing is to see North Korea embark on a new program for solid propulsion. In March of 2016 they test-fired, static test only, a 1.25 meter diameter solid rocket motor. Well, the importance is first, the diameter is the same as the Nodong. It is the same as Iran's Sajil, which is also solid propulsion.

So there could be cooperation and collaboration between the two countries. Not only is technology transferring from North Korea to Iran, but the other way around. We can see some evidence for it in terms of launch vehicles for space applications: Iran, a country (linked ?) to the design of the Unha-3 launch vehicle, in North Korea.

So we can see some details. Kim Jong-un seems very happy about all the tests, except the BM-25, which I wish I could see his face after the failure of the launch. My sympathy to the engineers that were involved.

(Laughter).

This was the test. The importance of solid propulsion is self-evident. You don't have to refuel the missile prior to launch, so it's ready to use. It could be fitted inside submarines. So it is a very interesting development in the arsenal of North Korea. Until now we saw only medium caliber rockets for short-range using solid propulsion, but now this is a new thing.

And they also started tests -- conducted a static test fire of the propulsion unit for the HS-13, so it was the first time for us to see it in action. By the way, they are using the infrastructure that was constructed to support its space program. So this is why I am starting (to look at ?) the space programs of North Korea and Iran, because sometimes they have more openness and we can see a lot more from those programs. There is, of course, an inherent relationship between the two programs, the ballistic missile program and the space program.

So we can see the propulsion unit clearly. You can see that the engine -- and there are four other small engines -- steer the missile. We still have to see a flight test of this missile to validate it, but we know for a fact that North Korea is always producing a large quantity of missiles, even before testing them. So they could compensate the poor reliability by quantity.

If you think it takes a lot of time to refuel a missile with this liquid propulsion, then think again. At first, they could do it horizontally. They don't have the need, like the Soviets did in the 1950s and '60 and early '70s, to go out into the open and erect the missile and then just start the liquid refueling process. We know this is the case in Iran. Iran has done it for many decades, horizontal refueling, undercover, underground. The same applies to North Korea. The transporter could come out, erect the missile, and fire.

So all the elements of the program are there: the missile, the engine, the nosecone, the nuclear device inside, and they're all fitted into one unified weapons system, which is a real and credible threat. You have to keep in mind that every time North Korea is launching a satellite into space -- and this was conducted last February -- it's another validation and verification of some of the technologies needed to a large scale ICBM, meaning cluster of engines, the flight program and computers, separation of stages. A space launch is not a launch test of a ballistic missile, you have to remember, but there are common elements in both programs.

We still have to see, like I said, a flight test of the KN-08. The recent report from Seoul about North Korea's further miniaturizing the warhead to fit inside the Nodong missile, would have a profound influence on all current assessments regarding Iran, because the Nodong missile has been in Iran's inventory for many years. So either Iran could embark on its own development phase to fit a nuclear warhead inside, or they could do it offshore, and just get it ready and implement this device inside on a different warhead of the Shahab 3, which is in turn the Nodong.

Riki said, 15 minutes. I've used 16. So I have a time for questions and answers, and this is my contact information. Thank you.

MR. ELLISON: Any questions?

MR. : Could you just talk about THAAD and what type of threat that could counter vis-à-vis North Korea but also potential coverage of Chinese missiles.

MR. INBAR: I think Riki can (talk about ?) THAAD but I can say that I don't see any Chinese influence on ballistic missiles in North Korean possession, except for some elements in the large-scale launch vehicles for space mission. The whole (structure ?) within North Korea, the whole support equipment, is Chinese. China, of course, was the provider of the TEL, the large truck for the KN-08, which was of course against any international resolution regarding North Korea.

MR. ELLISON: The THAAD system today is the only system that can provide an upper tier defense for Korea. The ships cannot do that. They're on either side. That system, proven 13 of 13 intercepts, is in Guam today, gives you an opportunity to hit an incoming ballistic missile in lower space, and also have the ability to discriminate what's coming through the re-entry and hit again in the upper atmosphere.

We are modernizing the Korean Patriot forces, so they have to go off-line. The Patriot forces that they have and we have defend point defenses, so they are terminal defenses of city blocks or an airport. A lot of those have to go off-line. So they become even more vulnerable on their critical protected asset list than they would be if they didn't have that. With the movement of North Korea and their nuclear capability, and the claim that the South Korean government said that they could put on short-range and medium-range missiles ballistic missile, this is the only system in the world today, in the world, that could be put in there and give a capability to defeat and intercept a nuclear

short- or medium-range missile going into Korea at the upper tier.

MR. : There was a report that came out probably about a year ago, maybe a little less, that talked about North Korea's nuclear capability and kind of gave it a low end -- 20 ballistic missiles by 2020, a mid-range of 50 by 2020, and a high range of 100. Can you talk about where you see that range in your opinion? And could you then maybe address a little further some of the tech sharing that may or may not be going on between the North Koreans and the Iranians and how certain you are that that's happening or not happening?

MR. INBAR: Well first, I cannot address specific estimations that I have about the quantity that North Korea could produce regarding to nuclear warheads. But you have to remember, even on the low end of the estimation it's a real threat because if they will ever use it they could inflict tremendous damage to anyplace that they wish. There is also the threat of creating an EMP over the region or over another country's territory. This is one thing.

The connections and the relationship between Iran's nuclear program and North Korea. Of course, there is cooperation and close collaboration, and personnel from both countries travel to each other's country. We know, for example -- I can give you just one example of a different type of cooperation.

Back in 2007 there was a mysterious air strike by some friendly air force that destroyed a nuclear facility in Syria. It was a small nuclear reactor built by North Korean personnel. The territory was Syria, the expertise was North Korea, the money came from Iran.

The purpose of this device was to produce plutonium not for the Assad regime, but for Iran. So there was cooperation at least until the last years of the last decade. The status of the cooperation today is somewhat unclear, but I suspect that Iran already has all the technical know-how to produce on its own without further help from the North.

MR. : I have a question about THAAD again, Mr. Ellison. The Chinese have indicated that they object more to the radar that is associated with THAAD than the THAAD batteries themselves. They have indicated that there is room for negotiations with the United States and South Korea. I was wondering whether in your view there is a way that THAAD can be deployed in such a way that it would alleviate the Chinese concerns yet still maintain the THAAD capability against North Korean nuclear missiles?

MR. ELLISON: THAAD in Korea, and in Guam, is deployed in that way because the radar has to be used to handle multiple and complex shots. So all its radar power and its energy is focused on a fire control radar to feed the weapons system the exact location and data that it needs to do an intercept. The radar in forward operating positions, which it is in Japan and it is in Turkey, have a different role. They look long distance to be able to see and pick up missiles and discriminate missiles on that. The threat that exists in North Korea, and that THAAD system deployed with its troops and

the launchers, is not made for that. So I think there's some misinterpretation from the Chinese on what exactly that is and the difference between those two types of radars.

MR. : Can you say how long it will take for North Korea to (develop ?) an ICBM system?

MR. INBAR: Well, you see all the components that they showed us a month ago, and we know that the program has been running for more than a decade. We don't know what type of nuclear device they are exploding underground. It could be just (a sphere ?) or it could be the actual warhead with a nuclear device inside to validate their design. So we cannot know for sure at this point in time.

MR. ELLISON: Our guest speaker is here. If we can welcome Representative Tulsi Gabbard?

(Applause).

REP. TULSI GABBARD: Aloha, good afternoon, it's great to join all of you, especially around this very important topic of the need for our country to invest further in missile defense. I serve on the Armed Services Committee in the House of Representatives, as well as the Foreign Affairs Committee, the Asian-Pacific Subcommittee of Foreign Affairs, and on Armed Services I serve on Seapower and Readiness. But one of the first things that I began to work on when I came here as a member of Congress was to raise the issue of the threat from North Korea in particular, and the need for our country and for the Asia-Pacific region to further invest in missile defense.

I've spent virtually my whole life in Hawaii and can tell you that not only on behalf of my friends and family but my constituents on every island across the state, every time we start to hear North Korea talking about launching this missile or that missile and beating those threatening drums, this is something that people in Hawaii take seriously. This isn't some far off theoretical threat, it's something that as we continuously learn about North Korea's increasing capabilities, year after year after year, that puts Hawaii as well as the West Coast directly within range of their ICBMs, it's something that is taken seriously.

When I first got elected there were -- I was surprised how many people were kind of nay-sayers, saying North Korea will never get there. They'll never be able to increase their capability to a point where we actually have to take it seriously. But now, as we listen to many of our military leaders, and our commanders especially from those in the region -- but even with our secretary of Defense and General Dunford -- they recognize and understand seriously the threat that North Korea does pose to our country, and that it does pose to our military capabilities, in particular within Hawaii, that serve the entire Pacific Command region.

It's funny because a lot of my colleagues hear me talk about the Pacific and Asia,

but unless they've actually gone there it's difficult to conceive of the fact that this command covers over 40 percent of the Earth's surface; just how big the Pacific Ocean is, just how far out everything is, and really Hawaii's strategic role sitting there in the middle of the Pacific Ocean. I think the thing that continues to command our attention is really the alarming rate that North Korea is increasing their capabilities. It was not that long ago that North Korea was developing ICBMs, but hadn't tested them.

And now just last week MDA told the Strategic Forces Subcommittee of the House Armed Services Committee that North Korea continues to develop the KN-08 road-mobile missile system and has ICBMs with a range greater than 3,000 kilometers. Meanwhile, we're all aware of the tests that they continue to conduct, in addition to what we are now learning about their ability to miniaturize their ballistic missiles. This all continues as we look at how much is our country actually investing in missile defense, and in some cases, under-investing now year after year after year.

There's a few ways that I think that we really need to address this. The first is, in particular with North Korea, see how we can maintain and increase pressure on their domestic economy where it matters. Obviously North Korea is not your average country in Asia, but really looking at the elites, in particular the leadership of the country, to see how economically we can strengthen those sanctions that will impact them.

We saw, in particular, the hard currency sanctions that were enacted roughly 10 years ago that directly impacted the leadership of North Korea and did cause them to come to the table and negotiate and come to some agreements. Those hard currency sanctions were dropped within two years when that agreement was met. Subsequently North Korea broke that agreement, but those hard currency sanctions were not put back into place. So it's those kinds of things that we need to look at bringing back in that we think can actually help to shape and change behavior.

Just in February the House and Senate passed, and President Obama signed, the North Korea Sanctions Enforcement Act into law, which is the most extensive North Korea sanctions legislation ever passed and provides many more tools to the administration to be able to use against North Korea. There's no question I was a key proponent of that, whether it's the legislation we passed or the existing sanctions that are not being enforced, in particular by China. China plays a key role in our efforts to eventually get to a place of denuclearizing North Korea.

Secondly, I have long been an advocate and strong supporter of accelerating our investments in missile defense, both in Hawaii across the region, and also generally, overall for our country. I think it's essential that we improve our capabilities in being able to see and have visibility quickly over incoming missile threats in the Asia-Pacific region, and to improve our ability to intercept them with the hit-to-kill technology. We had Secretary Carter and General Dunford before our committee just a few weeks ago, and I brought up to them this specific issue.

Secretary Carter acknowledged the need for better discrimination abilities in the

Asia-Pacific, as well as additional interceptors to meet that objective. So those are two priorities that I'm currently working on through our NDAA process. We're going through the amendments, and offering different amendments, and we will have our final markup later next week. Last year we started at 10 a.m. and we ended at 4 a.m. the next day, so we're lining up all of our ducks and getting ready for the marathon session, but look forward to being able to make some progress on this. This is an area where there is bipartisan recognition of the importance of it, and therefore bipartisan support. This is one of the things that I appreciate most about the two committees that I serve on is -- whether it's national security or diplomacy or foreign affairs -- these are two areas where it is most beneficial to the country when we're on the same page about doing what's right for the country, rather than (fight ?) politics for something as serious as this.

Another issue that I brought up with the secretary of Defense and General Dunford, and that I'm continuing to work on, is both making sure that the Aegis Ashore facility in the Kauai Pacific Missile Range Facility remains open, but also operationalizing it so that we have an additional tool in our toolkit to strengthen our defenses in Hawaii as well as in the region. This is a facility on the island of Koai in my district that is truly one of a kind in the country. There is not another testing facility like it, and it really, truly serves as an asset not only to our Navy and to our armed forces, but it's something that has proven to be a great asset to our allies who come and utilize the facility as well.

There are a lot of different challenges that we face when we're talking about this issue of missile defense and balancing that with the overall needs and draw on resources within the DOD. But this is something that I and many others agree requires more focus, heightening awareness, and really information being provided to members of Congress and our staff and our teams, for those who aren't directly involved or implicated in these direct threats such as we face out in Hawaii.

Thank you very much for the opportunity to speak with you, and I hope the rest of your day is well and productive.

(Applause).

MR. ELLISON: Just one or two questions, I would just like to start off with the understanding that our GBIs that are protecting Hawaii are 2,500 miles away. A majority of them are first generation. The rest of them are still being tested and proven out. So there seems to be a pretty big risk, and you only have a one shot opportunity to do this.

REP. GABBARD: Yes.

MR. ELLISON: Between now and 2020 when it's all fixed, you wouldn't have an emergency capability that you already have, that the taxpayers have already paid for, sitting right there, for a second or third layer tier.

REP. GABBARD: I think that speaks to my first point, which is about the

amount of coverage that we need, and that we need to cover, with limited capabilities, especially for the ones that are floating and on the water. Depending on the threat, they're often moved around to be able to cover different areas. If they're going to cover a certain area, you're losing that coverage somewhere else. So this is something again that when that time of year comes around when North Korea starts to make their threats, we go into PACOM and we get a brief from them on exactly what resources are being deployed where and where are the gaps in coverage that we need to be concerned about?

MR. ELLISON: Any questions?

MR. : Congresswoman, thank you for your time today. What would you propose that this administration or the next do to get China more engaged in this?

REP. GABBARD: That is the golden question, that I don't have a specific answer to. I think that as we look at the different ways we are engaging with China, we've got to be creative with seeing what are the right buttons that need to be pushed to be able to -- I don't know, incentivize isn't the right word, but basically to get them to the place where they realize that it's in their best interest to do this? We're seeing slowly over time they are getting closer and closer, and I think they're recognizing that the antics of Kim Jong-un in North Korea are creating a destabilizing effect for them. So they are seeing that it's causing more problems for them.

I've been there, to China, and met with the leaders there and asked them very directly this question about the need for their leadership. They agree ultimately on the objective, it seems like. I've gotten different answers from them.

Some say this is really up to the United States. You guys have got to be the lead on this. Others are just recognizing that they ultimately would like to maintain stability, and they're concerned about efforts to conduct a regime change which would make things very difficult for them.

I think that question of regime change brings up a whole other host of issues when you look at a similar situation that took place in Libya where the United States essentially promised Qaddafi that if he denuclearized that there would be no threat of regime change, and then the U.S. and others went in and overthrew Qaddafi, dropping bombs. So, you know, if you look at it from their perspective, unfortunately there's not a whole lot of trust in saying our goal is denuclearization versus regime change.

MR. : Some say that, regarding North Korea, that China is more concerned and more worried about U.S. intentions over there, than worrying about North Korea collapse affecting China. Do you buy that argument?

REP. GABBARD: I think they're concerned about both. They make no secret about their skepticism about U.S. engagement within the region, whether or not they're seeking to contain China versus standing with our allies, as we have done. So I would say that their concern is both. As far as which one outweighs the other, that would be a

question for them. But we hear consistently their concerns on both ends, and they probably see that they are connected.

MR. ELLISON: You just talked about the lack of persistence of the sea-based X-band radar that's housed there. And you've seen Alaska just get a brand new LRDR radar that Hawaii's not part of that coverage. It seems to me that there would be room to have an LRDR radar in Hawaii that can increase the probability of kill for the GBI, than rely on the persistence of the SBX. Is that -- are we driving in that direction?

REP. GABBARD: That is -- yes, yes is the short answer. I don't have details or a timeline, but ultimately as we look at increasing investment in Hawaii in particular, that is a key element of it.

MR. ELLISON: Well thanks for your time.

REP. GABBARD: Thank you, very much. Thank you.

(Applause).

MR. ELLISON: You heard the importance coming, from a different perspective, on how we need to be able to ensure protection for our assets while we're building up to the 2020 timeframe. Are there any questions you would like to ask Tol or me before Senator Sullivan comes in?

MR. : I'd like to ask you about the (national security ?) review of North Korea. Do you think international sanctions can slow or stop North Korean missile development?

MR. INBAR: I think that the current set of sanctions are indeed very severe against North Korea, but at the same time it is very hard to stop the programs using sanctions alone. I don't think that in the foreseeable future we will see North Korea's missile program coming to a halt.

MR. : I'm just curious as to the solid fueled long-range missile, how progress on that would affect (Iran's ?) long-range solid fueled missile?

MR. INBAR: Well, it's quite simple. If North Korea will master the technology of making ever larger and larger diameter solid propellant motors, they could create much simpler designs of -- and reliable -- line of ICBMs. The same missile today in the KN-08 -- the same size of a missile -- but with solid propulsion could reach much greater range. Or, you could just put a much heavier warhead. So the trend is very clear and every nation in the world that developed this technology has transferred from a liquid to a solid one.

MR. ELLISON: Tal, could you tell us about how they're going to achieve the re-entry friction and how they test it and prove it out for an ICBM capable? Can they not

test that and develop the system to be operational?

MR. INBAR: First, you have to remember that North Korea has its own very peculiar way of introduction of missiles to military service without a full test of the system. But you could conduct -- this is easy to conduct in such a way that I showed before, and you could also use, for example, when you launch a satellite into space you could just put some simulated warhead within the launch vehicle and test it during its re-entry.

MR. ELLISON: Are you saying they've done that already?

MR. INBAR: I don't know. Regarding the space warhead, I don't know. But the other tests, they succeeded and conducted them.

MR. ELLISON: How long would you estimate until they have a MIRV capability at the pace they're going today?

MR. INBAR: I'm not aware of any MIRV development project in North Korea. It's only logical to assume that sometime in the future they will explore this possibility. Being nuclear MIRV'ed you have to conduct a lot more of miniaturization and you have to build the reliability into the design of the nuclear warhead for such a small device.

MR. ELLISON: Ladies and gentlemen, I'd like to introduce and welcome Senator Dan Sullivan.

(Applause).

He's going to be one of our great emerging champions for this issue. We saw each other up in Alaska, in your hometown, recognizing your warriors up there.

SEN. DANIEL SULLIVAN: Good afternoon, everybody. Sorry I'm running late. The one thing I haven't learned as a U.S. Senator yet is scheduling. When you've got a bunch of young Alaskans who are in town and you're scheduled to see them at 2:15 p.m., sometimes it takes a little longer. So I apologize.

I want to first thank all of you. And I want to thank Riki in terms of his advocacy, in terms of the importance of this issue and the leadership that so many of you and so many others have provided. Look, I really want to have a discussion, because one thing I've learned from my time with him and others in this area is just how knowledgeable so many people who are focused on the issue are. And I certainly can take questions, but what I'm interested in as much is suggestions. I'll just mention a few kind of topics that we can start off the discussion with.

There has been a lot of interest in missile defense of late. I think that there's two reasons for that right now, but there should be even more, North Korea and Iran. You may have seen some of the hearings lately. We had a hearing just last week on the

Senate Armed Services Committee.

Admiral Gortney of NORTHCOM has talked about the threat that both of these countries pose to the United States and our allies. He said while the threat is, for his perspective, low-level with regard to the North Korean's being able to miniaturize a nuclear intercontinental ballistic missile, he said it's something that he does not view as an issue that they should not only not ignore but should prepare for. It's' low-level now. I asked him in a hearing, is low-level now but do you think that that threat is going to increase to moderate and high over the next couple of years, next several years? He answered, yes.

So we know it's low-level now. What I mentioned in this hearing, which I was concerned about, is you see the threat going like this, to our country, and by the way not just Alaska and Hawaii. I know Tulsi Gabbard was here before I was. She's another strong advocate. The threat is going like this, but the spending and capability, initially under President Obama, was going like that. It came back. But what I worry about is that you have either flat or slightly declining when the threat is going up. So that's not good. It's an issue that I have been focused on in the committee.

The other thing, of course, as you can imagine, is somebody who's not only on the Armed Services but as Alaska's Senator, as hopefully many of you know, Alaska is the cornerstone of our missile defense in so many different ways. One thing that is positive, from our perspective, is that we're going to start to see a significant increase in spending and investment at Fort Greeley, in terms of having 40 Ground Based Interceptors there by 2017. Interestingly, as I mentioned, President Obama initially was not supportive of that. But I think once he came into office and started getting his daily intelligence briefings, there's nothing like having the responsibility of your nation to change the trajectory of your policy. So that is where we are with regards to that.

We also have Clear Air Force Base, the LRDR system that's coming in, and even some opportunities that we have with regard to additional testing in Alaska in places like Kodiak. So there's a lot going on to my -- I won't say delight, but to my certainly strong interest. At our last hearing that we had on missile defense in the Armed Services Committee, a good portion of that was focused on these programs. A good portion of that was focused on what's going on in Alaska and, as I mentioned, the threat.

So your advocacy and your focus on this issue is critical. It is an area where I think there is strong bipartisan support, certainly on the committees. But your continued work on this is going to be more and more important because, as I mentioned, this is clearly one of these threats, from the U.S. perspective, that is not going to go away, that's not going to decrease. It's only going to increase, and we need to be ready for it.

So I think we have a decent start, but there's a lot, lot more to do, and that's where you come in. So Riki, I want to thank you again for your leadership. I don't have to brag about the guy, but I think there's a lot of guys in the room who look like they're saying, when I grow up again as a kid I kind of want to be what Riki Ellison is like, right?

A couple of Super Bowls, a couple of Rose Bowls, and then coming out of a very successful professional sports career and then doing something that is intellectually stimulating but incredibly important to the nation that we all love. So thank you again.

I'd welcome any question, suggestions, comments or concerns. Thanks a lot.

MR. ELLISON: I could say the same about you with the U.S. Marines.

(Laughter).

SEN. SULLIVAN: Well I'm in the Reserves. I've got to go do Reserve training starting tomorrow. So you're going to see, this is looking a little long for a Marine Corps officer, so next time you see me I'll probably be wearing much more of a high-and-tight. I love being a Senator but -- I probably shouldn't say this in public -- but I love being a Marine even more.

MR. ELLISON: Can I just start off? I saw you in the hearing and I saw the big tremendous cut on missile defense and saw the reasoning from MDA for their R&D and so forth on it. Are you as a committee going to address that or challenge that?

SEN. SULLIVAN: What you saw in the committee was I was asking about that cut. You saw the chairman of the subcommittee, Senator Sessions of Alabama, was asking about that cut. And what you saw was the administration, Admiral Syring and Admiral Gortney, first trying to explain it. So they were talking about what percentage of the MDA budget was going to R&D related issues, and what percentage was focused more on operational issues.

Look, I have a lot of respect -- deep, deep respect for our military members. I'm someone who has criticized the president in a number of different areas on some of his foreign policy and national security policies and choices. But the one thing where I have complemented him, or have complemented Secretary Carter, is on his choice of military leaders who are leading our military right now.

Look at, for example, General Dunford, the Chairman of the Joint Chiefs; General Milley, the Chief of Staff of the Army; all of them. We had hearings just yesterday, or this past week, on the Armed Services Committee with General Scapparotti, who's leaving being the Commanding General in Korea to go run NATO and be the Supreme Allied Commander. These are very, very top of the line military officers.

The reason I'm mentioning that is because when you ask them the questions in the hearings, I think it's a tough question. And we did ask the question, and I've asked the question in full committees, I've asked the question in subcommittees, which is, general, admiral, given the threat, do you think you have enough resources to address it?

The reason that's tough is because -- and a lot of times they're there supporting the DOD defense budget. But the question typically is posed as, in your best professional

military judgment, which is language that you use to address a general and kind of give them the leeway to maybe show a little daylight between what they believe and what the administration's policies, as reflected in the budget, are. So you may have seen I asked that question, and they were still of the mindset that that budget reduction was adequate.

You probably saw in the committee -- the reason we asked about it, the reason the chairman, Senator Sessions actually had a chart showing the decline, because there's a lot of skepticism on this issue. So it's something that we need to work. I don't know the exact answer, if we're going to be able to plus up and make up the difference in terms of a delta. But as I mentioned, the threat is not going away. What I don't think we need to be doing is to be having declining budgets. They are not drops, huge drops, but they are declining. And from my perspective, there's a strong case to be made that again, I use this kind of language in the hearing. If you've got a threat going like this and you have declining spending, that normally is not the way to address your national security challenges.

MR. ELLISON: And can you address the down-cut? There are capabilities that already exist that our military has around the globe that could enhance the security of the Pacific. We're moving a baseline MAN (ph) ship over from the Atlantic, a THAAD over there, dwell time on the SBX out there, the things that are there that if the threat was serious it would seem that we would add capability and inventory to deal with it, but we don't think take the threat.

SEN. SULLIVAN: I think there's a lot of interest, for example on one of those, with regard to THAAD. We have -- I don't know if Jason is here but I was out in Guam and we have our -- what system do we have out there right now, Jas?

MR. : It's a THAAD out of PRMS.

SEN. SULLIVAN: Yeah. General Brooks at his hearing just yesterday, the new Commanding General for our forces on the Korean Peninsula, talked about the particular set of threats that are emerging in North Korea with regard to their missile development. I know that from their perspective they view the THAAD as critical, as we're moving and looking at the Korean Peninsula. I know, for example, that they've announced what they're ready to deploy.

You can imagine that has created a little bit of consternation with the neighbors north or North Korea, the Chinese. The message from the administration, which I think has been the correct one, is this is not directed at you. We have troops there, we have alliance interests there, and we're doing it to secure and protect those interests.

Whether it's Aegis, whether it's the THAAD, as you mentioned, Riki, we do have capabilities to address that. But I keep emphasizing -- and you're almost seeing it in the paper every day, which again is why what you guys are doing is so relevant -- the threat is going to continue. The threat is going to increase, and I think that's something we need to be ready for.

MR. ELLISON: And in that testimony -- (reflected that eight star ?) letter that said that our policy basically doesn't match their will to expand and invest in a system, because it's on the wrong side of the cost curve in terms of that kind of capability. When do you see us shifting into a policy that opens up to the more complex, more multiple threats; that we can embark on non-kinetic energy interceptors and space and so forth that will keep us not on a cost curve situation where it becomes -- is that (out there ?)?

SEN. SULLIVAN: I think that's a great question. As you can imagine, it comes up in the subcommittee, one of the issues that always comes up. And again, this is where your expertise and your briefings for Senators and others on the committee, is that when you talk typically in terms of the space angle, what almost always comes up is cost, always.

And you guys, I think in some ways, can be very helpful in terms of the educational aspect of that because those programs are almost always associated with the debt, for now, with very significant costs. And maybe I'll throw it back out to you, what's the counter to that, I would say, almost kneejerk reaction to the discussion with regard to space? People start to think that that's going to take away from the ability to address some of the ground-based approaches, some of the other components that we're working on right now. I mean, what's the counter to that, because that's what I hear? And literally, it almost is a conversation that almost has a hard time getting off the ground because people think that that's a really, really significant cost.

MR. ELLISON: I can give you -- let me just give you a good counter to that. I think we all agree that the discrimination capability from a global, persistent, 24/7 is best done from space. A constellation is a couple of billion (dollars). But we are in radars that are a billion apiece that aren't giving you the constant global protection. I know you have to have them, I'm just giving you the counter here. Why would we not go into a direction where we could invest into a space constellation that would have discriminatory capabilities and situational awareness for roughly the same kind of cost?

SEN. SULLIVAN: And do you think that would be roughly the same cost?

MR. ELLISON: I would think a simple constellation would be in that range, between $3 to $4 billion, somewhere in that range.

SEN. SULLIVAN: And relatively deployable?

MR. ELLISON: I would put it on -- not as a single system. I would put it on a package on other systems that are existing and new orbits. Again, I'm not an expert, I'm just throwing that out there. But in the long run, when you're doing complex threats with multiple shots and all that stuff, 20 years from now, I think the current capabilities may be (overwhelmed ?).

What other questions, thoughts or comments.

MR. : As you mentioned, China and even Russia are strongly opposed to deploying THAAD batteries in South Korea. We are trying to persuade -- (off mic).

SEN. SULLIVAN: Well again, I think the argument is that this is not directed at either of them, right? We have core national security interests on the peninsula, not only South Korea as a critical strategic ally, but our troops, our own troops. Russia and China don't get the unstable leader of North Korea on a daily or weekly basis threatening their country the way Kim Jong-un does with regard to South Korea and the United States. So I think we are well within the right to protect our interests and the key interests of our allies to deploy the THAAD.

And, you know, certainly we can keep those other countries informed of what we're doing. We can be transparent about it and explain our rationale. But in my view it would be an enormous mistake to give Russia or China any kind of veto over something so important as that.

MR. : The assistant secretary of Russia yesterday said we will strongly respond (off mic).

SEN. SULLIVAN: I think we certainly work hard with our colleagues here and we're promoting it, but you saw the bill that came out of the U.S. Senate that passed with very, very strong numbers. I think you're seeing a bit of a change on a number of strategic issues. The Senate has been trying to take the lead on a number of issues, particularly in light of the Iranian nuclear deal, which I strongly opposed.

MR. ELLISON: We have time for one more.

SEN. SULLIVAN: Those were very, very hard-hitting sanctions, as you saw. The one thing that I think is really important to recognize that is often missed, and I think was somewhat misleading during the Iran nuclear debate, there was this sense from President Obama and John Kerry that if the whole world or all the UN is not -- if the entire international community is not aligned on sanctions, then they're not effective. Well, unilateral American sanctions, particularly in the financial world, can cripple an economy, just ask the Iranians. We took the fight for strong actions. Your question is a good one, though, what more is there to take? I don't have a direct answer to that.

MR. Are you satisfied with President Obama's reaction so far?

SEN. SULLIVAN: Well, I think if they take a -- if they test another nuclear weapon we have to look at another round of not only sanctions but actions that show our significant disapproval. But I don't have an answer exactly what that is.

Again, I apologize for being late. I want to thank you again for your leadership. As Riki said, you have a strong advocate, very strong advocate, right here who is very, very not only interested in the issues in terms of the funding, but given that I'm the

Senator from Alaska, these are critical issues for my state, which is a good combination. So thank you, again. I appreciate you guys putting this together and it's great to see you.

(Applause).

MR. ELLISON: Thanks, everybody.