Mr. Riki Ellison:

Good afternoon, ladies and gentlemen, from a fall pre-Thanksgiving day here in Alexandria, Virginia on the week of Thanksgiving. We've got a lot to be thankful for. Certainly we want to be thankful for the Missile Defense Agency and the U.S. Navy Aegis BMD program. It's been phenomenal. I'm Riki Ellison, I'm the founder and chairman of the Missile Defense Advocacy Alliance. We established 20 years ago. I've been involved with it for 40 years. And our sole mission it is to advocate and educate for the deployment of missile defense capabilities across all domains to make our nation and the world safer. And you can see the world today, we got to have the capacity and capability out there and we're going after it.

This is our 57th virtual. This one is on the validation of our best missile defense capability that our nation's produced, that is the Aegis BMD ship that is in the U.S. Navy. It is a 360-degree capable, integrated defense that goes all the way from sea level with drones all the way up to space with ballistic missiles and hope to be soon hypersonic missile defense that are capable on that.

I do want to mention and recognize the President of the United States Joe Biden and the President of China for their diplomatic efforts last week in Woodside, California in a competitive, mutual, peaceful environment. So that's good to see diplomacy in play.

And I also want to congratulate our new CNO Lisa Franchetti. She, by the way, I believe was a captain. Her ship was USS Ross, a BMD ship. So it's cool to have our CNO be part of that aspect of it.

Well, getting back to Aegis, one of the great reasons why the Navy's been so far ahead of it, it's been their culture, they kept their eye on the ball with Admiral Wayne Meyer and build a little, test a little, build a little, test a little. And we've just recently witnessed the great test we just had out in PMRF. That happened, really, I think it's the first time historically, and Tom you'll be able to correct me, that we were able to do two or more SM-3 variants to simultaneously on both land and ballistic, which now validates the fact that we need to have capacity now since we can do this on top of that.

So that's a tremendous achievement and I think this goes in the world today as we've seen the validation of the USS Carney that Ron captained way back when that went out and I think shot four land attack missiles out of the Red Sea and 16 drones. That's a huge validation of the combat capability of the Aegis system that all of you worked on. We're seeing the movement in the Pacific. We're seeing the movement on Guam, on that architecture, which is fundamentally based on this Aegis BMD capability. We've seen movement in Europe, certainly the Aegis Ashore sites that are there, but more importantly, the ships are out Rota and more importantly, the Formidable Shield that we've had integrated capability been in place for many years. We've been doing that aspect of it.

We are concerned that administration may be cutting MDA's budget by a considerable amount and that the value is not really understood of MDA and as he just put BMD systems. And I think this is a very valid point of discussion today on how valuable MDA is to the war fighter in this kind of capability. And it certainly be hard to believe, but we would reduce our missile defense budget at a time like they're doing with the conflicts that we are in in the world today.

Okay, so we've got three great speakers. All three of them, I think close to a hundred years of experience in the Navy. We've got out of those three, there's been three BMD ships commanding on top of that.

So we've got an excellent group of discussions and I'm going to start it off with our first speaker in Tom Druggan, who's the senior associate at CSIS, but was, I guess, the last flag officer as the PEO of Aegis. And he comes from a great line from Kate Paige to Brad Hicks all the way down. And I would, Paul Mann's pretty damn good, Paul Mann's a great one and I've enjoyed that. But you get to come to it from that perspective. You've overseen tests, you've overseen the development of this system. So it's going

to be great to hear from you, Tom, but what that test actually proves technically and where we need to go with Aegis and where MDA needs to go.

RDML (Ret.) Tom Druggan:

Okay.

Mr. Riki Ellison:

You go to town.

RDML (Ret.) Tom Druggan:

So, I'll bring it up to date. I'm the CEO of a small company called Strategic Insight Limited. We're a professional consulting company. We help our clients really achieve clarity and order on their toughest problems. But as you mentioned, I'm a senior associate also at the Center for International Strategic Studies, a world-class organization. I work with Tom Karako there on the Missile Defense Project and working on some products for him. And we'll talk about the things that we'll talk about today are right in that vein for CSIS and Missile Defense Project there. So great to represent both organizations. Thanks for the invitation today.

So the opener will be really three notable recent Aegis events as an Aegis update. One, we probably won't talk about because it's at the beginning of its journey. And that's USS Jack Lucas DDG 125, our lead Flight III Aegis destroyer.

So what that lead ship brings in Flight III is Aegis Baseline 10, which is a pretty significant update to Baseline 9 and the SPY-6 air and missile defense radar. So this is our first solid state GaN radar that we have in the United States Navy. The Navy is coming through a generational change from military specifications, MilSpecs, and analog systems to digital solid state. And so, Flight III really represents that step on the radar side of the house. And it's an important one because it brings so much more capability with it.

Today, I think that ship is built. It's been delivered to the Navy, it did a test firing to make sure the fire control loop was intact as it came out of the building yards. That was successful. So that's a great start. It is the start of a huge test program. They'll go through ship qualification firings, they'll go through operational tests and that's going to take a lot of time as it normally does for leadership with brand new cutting-edge capability. So we probably won't talk about that one too much. Again, it's the beginning of that journey, but a good start there.

The second one is USS Carl Levin, another Aegis destroyer. This one is Baseline 9.C. It's our latest integrated air and missile defense capability. It's got an advanced capability and it completed a missile defense agency test out in Hawaii called FTM-48. This was the most complex IMD test that we've done to date because it was not just BMD, but it was also air defense.

So there were two cruise missiles coming in. There were two ballistic missiles coming in, all targeting the ship, arriving at the same time and time to make sure that all defensive missiles were in flight at the same time and completely successful.

Now, some people may think that's really hard. I got to tell you, this is straightforward. This is not ... If you want to test the full capability of an Aegis ship, bring a billion dollars for a test program. All right? But it was good to get that validation of being able to do BMD, ballistic missile defense and anti-ship cruise missile defense at the same time. Complex scenario, lots of missiles in flight simultaneously. Piece of cake. So that's good to get that done. So now we can move to the next level.

The last one is USS Carney and now USS Thomas Hudner, both ships there in the Red Sea. Carney was shooting down land attack cruise missiles as you mentioned, and also drones. Drones. Who knew Aegis could shoot down drones? Of course, Aegis could shoot down drones. It's interesting to me that people think that they couldn't for a long time, but now there's proof in the pudding in a real world situation and we want to bring lots of different kind of defensive capability to the drone fight using missiles to shoot down drones is not always the best option, but when you got to do it, that capability is there. It's important capability. And the land attack missiles, of course. Again, deep inside the design space of the Aegis weapon system, very straightforward. And then Thomas Hudner was also shooting down some drones there.

Now it's interesting because Carney DDG 64 has not been through a major Aegis modernization. It still has the basic computer suite and spy radar from the 1990s. Now, it have some agile processing with modern cause processing to give it more advanced capability. And it received its last update a few years ago called Aegis Baseline 5.4.

All right. So even though this is an older baseline on an older ship, it's fully functional for cruise missile defense and ballistic missile defense. There are things that Baseline 9, that's on Thomas Hudner, can do in addition to that. But that solid foundation for our Flight Is and our Flight II DDGs, that's from DDG 51 to DDG 78 is really excellent all by itself. They're also all BMD ships. So what's important about that is in about 10 years, they're going to start being decommissioned potentially.

And the Navy really has to make a decision if we're going to lose half of the BMD fleet within five years or not. In the future, that'll probably be about a third of the BMD fleet. But right now it's about half of the BMD fleet in the United States Navy. And we can't afford to just tie those ships up and decommission them at all. Big decision on how and whether to extend the life. And it'll probably have to be made by-hull, because some ships will just be in better condition than others.

But the ones that still have life left in them, we really need to think about extending them as long as we can to keep that BMD capability in the fleet. And the reality here is no ballistic missile defense, no anti-ship cruise missile defense air defense, no hypersonic missile defense, no ballistic missile defense. None is the wrong answer. We know that. Having it on everything everywhere, that's a pretty large investment and has to compete with offensive capability and things like that. The right answer is somewhere in between and Navy analysis and assessment will determine where that should be. And then we'll have the budget fight over trying to get it resourced.

So that's a quick update. All that within the past six weeks. We had Jack Lucas shoot as lead Flight III, we had USS Carl Levin out with the FTM-48 and the most complex IMD scenario we've ever had. And that was a joint Navy and MDA testament. And then we had the real world events with USS Carney and USS Thomas Hudner. So keep watching the paper. I'm sure there's more to come, but just really good to see you just at the forefront of defending our country and our allies.

Mr. Riki Ellison:

Thank you, Tom. How do we take these lessons that are just phenomenal and put them on land? How do we do that? And in talking both Europe Formidable Shield, which seems like they're integrated missile defense through Aegis is more integrated than the stuff we have on land there. Same with Guam. How do we take these lessons? And I think we've just taken part of it, not all of it, the BMD only. Why wouldn't we take the whole thing that if this is that good, why wouldn't we be able to do-

RDML (Ret.) Tom Druggan:

Great question, right? So it depends on what you're trying to do and where you're trying to do it and what your needs are. So the Missile Defense Agency does have a defense of Guam program. Aegis has a

pretty significant part of it, which is hypersonic missile defense and ballistic missile defense. And it's disaggregated approach to the weapon system.

That's a little different. That's where the engineering is. It's not rocket science, it's not science and technology. It's definitely deep into the engineering domain on how to do that properly. But there's good engineering work to be done there.

So, because of that and building on the Aegis legacy and the Aegis heritage here, it won't take 15 years, right? They got a jumpstart on the whole effort. Cruise missile defense, land cruise missile defense is different, right? And they're trying to defend a whole island. So you can't have a central site that can really do it well. And so, that was given to the Army to bring their systems to bear.

What's really important, I think, is the command and control piece of the defense of Guam because you will need a central command and control to allocate fires and to do it properly. And there should be electronic data exchange between the Army sensors, between the Aegis sensors and national sensors. There needs to be a fusion center that needs to be right at the fingertips of the commander in charge to be able to use that and allocate fires.

Allocating fires between in terms of deconfliction is pretty straightforward when your Army's doing cruise missile defense, lower altitude, and the Navy's piece is doing hypersonic-

Mr. Riki Ellison:

In sense [inaudible 00:15:39].

RDML (Ret.) Tom Druggan:

It's an easy way to do it. The aircraft pilots do it all the time having vertical separation, right? This is pretty straightforward to be able to do that. So I don't expect a lot of conflict of which system is going to take a shot. If the Army systems won't see the BMD threats, they won't see the HMD threats and the Navy side will. And the Navy, with its radar, will also be able to support with information and data and track data the Army side so that they can really get a heads-up on the threats that are inbound and come up with a plan to counter.

Mr. Riki Ellison:

It's pretty cool that-

RDML (Ret.) Tom Druggan:

But it needs to be a priority because the situation in the INDOPACOM is not getting easier.

Mr. Riki Ellison:

It's pretty cool that the Carney shot down land-based land attack cruise missiles. That was pretty effective. And since the Army doesn't have a cruise missile defense system yet, we're waiting for IFPC, that it would seem logical that you would put land-based cruise missile defense capability on your VLS if you have to wait until if it comes in, why wouldn't we not do that? And the second question would be, what's going on with hypersonic rocket defense? Why isn't the PBO of Aegis missile defense focused on that? Why are we so far behind? Why?

RDML (Ret.) Tom Druggan:

Yeah. I ..

Mr. Riki Ellison:

... so far behind? Hundreds and hundreds of millions of dollars on this thing. We're not.

PART 1 OF 4 ENDS [00:17:04]

RDML (Ret.) Tom Druggan:

The hypersonic missile defense is alive and real, and there's a program there for the Navy, right? And it will transition into the defensive arm. Again, the Aegis weapon system, there is charged, its duty will be a defense against ballistic missiles and hypersonic missiles to include hypersonic glide vehicles. Well, I think some of it's been shaved off and that just slows things down and it doesn't slow it down by months, it slows it down by years. It is being pushed to the right. That's my understanding.

Mr. Riki Ellison:

All right. I know Mark's going to chip in on that, but I appreciate that and appreciate your leadership, because we wouldn't have gotten to the point where we're at Tom, without you in your era doing what you had to do to get to where it's at. So it's evolved. It needs to evolve faster and quicker because of the threat nature that we're facing.

RDML (Ret.) Tom Druggan:

That's right. And to be clear, we have hypersonic missile defense today.

Mr. Riki Ellison:

With the SM-6 capability.

RDML (Ret.) Tom Druggan:

On US Navy ships. Yeah.

Mr. Riki Ellison:

Okay. All right. We're going to switch it over to the former captain of one of our most famous MDA ships ever, the Lake Erie. That's a classic ship that did a lot of the innovation at the beginning of the USS [inaudible 00:18:23] but Vice Admiral Ron Boxall is famous, I would say Ron, for your being the J8, director for force structure resources and assessments, and joint requirements for the chairman. And this is a big time deal guys, for everybody. He prepares the Department of Defense's $700 billion plus budget for the years '21, '22 and '23. He sees the missile defense issue as firsthand as a captain and in engagements, I think, with his ships there, all the way to the big funding levels. And certainly Ron, we're going to want to know why missile defense is so little in that budget, but it's all yours to give us a run on. Thanks Ron for joining.

VADM (Ret.) Ron Boxall:

Yeah, well thanks Riki. Let me clarify one thing very quickly is that I'm not doing the budget this year, so I'm very happy not to be doing that. I will say that you hit on the fact that where you come from guides you how you think about the future. I go way back to Lieutenant Boxall pre-commissioned USS Ramage, an early DDG, and again, another one of the Carney-type ships that can do the BMD mission very, very well.The Ramage, I think I was there in '94. Then I went from as a department head up to XO on USS Hué

City with the cooperative engagement capability. That really was one of the keys that allowed us to do some really good integration with other ships and ultimately other joint partners.

However, it did shut down four great ships for cruisers for a while with the Anzio, Cape St. George, us, and Vicksburg, as Hué City. Then it went of course to Carney. Carney doing the great things you see out there now. And again, I think she has pretty much the suite that's not too dissimilar from what we had when I was on board. Obviously, upgraded to processing and things like that, but it just shows you what we keep building on, where we've come from. And then one of our oldest DDGs is still out there in the mix of things today providing value.

But Lake Erie is really where I think I started to become a real big believer in how good Aegis was as the test ship, and I just reported aboard right after Burnt Frost, which is when we shot down the derelict satellite that was falling out of orbit. One shot, one kill, to a target hitting around 22,000 miles per hour. And to think that we could make that engagement in a matter of centimeters just shows you the type of precision engineering that goes into that. And it's been, again, this build a little, test a little, learn a lot.

And as all things happen, you tend to take those jobs and after you have a good time, they bring you back to the Pentagon. I was lucky enough to get to be a carrier strike group commander and I was a strike group commander trying to defend my carrier strike group in the middle of the South China Sea. I used to tell everybody when I was in the South China Sea, I had eight ships and three of them were Chinese. I very much saw right up close and personal what it felt like and what you needed to be prepared for. And when I came back to the building as the N96, the director of surface warfare, we are responsible for the investments in Aegis and also all the other capabilities that that destroyer needs out there. The land attack, the strike, the ability to communicate, the electronic warfare, all those other things.

And again, no good deed goes unpunished. They sent me up to the J-8 where now I have to kind of think about across the whole spectrum of all the services and all capabilities with this new joint war fighting concept. Where does ballistic missile defense fit in or integrated air and missile defense fit in? And what we found was really just, as a department, we were making everybody unhappy, whether it was the Indo-Pacom commander who just more was better and obviously wanted everything you could get out there right now, whether it was going to pace the threat or not. And then you had other views that said, "Well, we need to balance this threat with the other things we're not doing. Defensive hypersonics is a problem, but so as offensive hypersonics and weapons and munitions. And we have to combine everyone's ability to see things all at the same time. Integrating space and sensing and the ability to ..."

So you start having these huge head blow-up experiences, where the joint warfighting concept, we said, okay, we got to get some kind of agreement on what is most important. Where in the air missile defense world are we most susceptible or most vulnerable? And if you had talked to the NORTHCOM commander, he'd tell you that it was the cruise missile threat in some parts of the world. And if you talked to the strategic command commander, he'd tell you it was the ballistic missiles coming from near-peer competitors. If you talked to Indo-Pacom commander, it was everything from these new FOBS, these fractional orbital bombardment systems that could be flying around space ... And tested one just a couple years ago. And the shot Heard around the world, General Heighton said, "What are we going to do about this?"

As we prepare to be in the right place ... Carney's in the right place off of Yemen. In missile defense, you need to be in the right place, but when you start thinking about something that can drop from anywhere in the world, then you start having to rethink about the whole network of integrated air missile defense. That's where the theory of integrated deterrence was brought up during the ballistic missile defense reviews. We could argue all day whether or not we think that is a valid construct, but it is what is driving some of the thought behind the investments and where we have to go.

If you look at the three big areas that we looked at in J-8 to say, "Okay, who owns what and where are we going to hit first?" Well, obviously the defense of Guam was critical to the Indo-Pacom commander, so that's why you're seeing what you have there today. We looked with the Northcom commander, he was concerned about cruise missile defense of the homeland and potential there on the risks that we have. Those were two of the drivers. And of course the threat of strategic nuclear defense, ballistic missile defense, that's always the number one priority, our triad and our ability to protect ourselves.

One of the things that is challenging is that when you look at missile defense agency's budget being cut, in a flatline budget, which I would argue I don't really think we're flatlined with the things you're seeing today between inflation and the looming 1% cut for example in this, if we don't get a budget by the 31st of December, which it's probably not going to happen, but we really have until April. All these things coming at once, whatever you do to increase one thing, you decrease in another. It's a zero-sum game. And whether it should be or shouldn't be, I believe that it shouldn't be, we should be having some real growth if we're really concerned about a near-peer competitor. Then we have to prioritize inside of the portfolio. We brought all the key players in, missile defense, all the services, all the co-coms, and obviously, prioritize the three that mattered most in this area, and that's what drove the investment.

Now at the same time, while this is going on and you got everything flat, we go to Ukraine and we see what's going on with drones and counter-drones and some of the new ways of targeting and using commercial space. We can dive into any one of those areas if you'd like to, but it's just you really get into this environment where we have to get a target quality network out there that's not just Navy driven by Navy. We've succeeded and I think that's why we get there first, but we have to integrate space to be able to track a target, whether it's flying in space, whether it's flying off the deck, whether it's a tiny thing that we've got to pick up on radar, we've got to be able to have a network out there that can support the ability to transition whatever it is to whatever might be able to be a good effector.

Sometimes it's an offensive weapon, sometimes it's perhaps a directed energy weapon. Perhaps it's something in another domain, shall we say, or how you integrate those capabilities with the operations and what the combatant commander can actually do to affect threats in his or her area. That's the way I look at the world. I'm sorry, I'm not going to give you any more money or tell you why I cut anything. Those decisions are happily in my past. But I can tell you that I do believe that it's critical that this is the fastest, hardest problem we have in our threat inventory out there. If you look at the speed that things are coming and the number of weapons that are being produced in China, then we have to be concerned about how we're going to continue to affect it.

I think it's great that we've had some incredible hard-kill systems that we have out there, but we have to start looking towards other ways of bringing in space assets for sensing combined and integrated with sea-based and land-based systems as well as the ability to find other ways to affect endgame or earlier in the detect to engage sequence.

Mr. Riki Ellison:

Thank you. Thank you for that. In today's world, are we set up doctrinally the best way to do this? I know we're talking about maybe joint core for missle defense or the JIAMDO, which is three-year cycles. To get on top of this problem that we've got, certainly the Missile Defense Agency should be doing that development, but to create capacity, it can't come from MDA, it's got to come from the services who don't want to trade off their offense for defense. And we're still at a very fractional cost and 1.8% of our defense budgets on defense. Do we need to address that on a bigger position or are we just going to keep doing what we're doing without roles and responsibilities, discussion, at the highest levels to make those changes?

VADM (Ret.) Ron Boxall:

Well, if you look at everything we're doing, if you look at the building ... I've done three joint tours. I did my first joint staff tour in 2004 and I was very disheartened at the way the process held everything down, and I just couldn't wait to get out of that tour. Vice Admiral Blake used to say, "Poor performances are rewarded with tour extensions." I got two subsequent tours in the joint staff and specifically ended up being J-8. And I can tell you that one of the things that you look at is everything becomes more joint and integrated. Integrated warfare is joint warfare and everything's becoming more integrated. I don't care whether your home computer, your oven, your wi-fi systems in your house and what you can affect, this internet of things, everything has become more integrated. We have a joint staff that's always had the integrated view, but the money is aligned over the Title 10 responsibility of the services.

Sadly, that disconnect does slow you down. There has been a big move, started with General Selva as the vice chairman went to ... then Selva and now it's with Admiral Chris Grady as the vice chairman, to drive those discussions on portfolio reviews. They are having very big boy and girl discussions about, "Okay, this is our portfolio, these are the key threats. What are we doing to get after it?" I can assure you that there are things that you're not going to read about in the papers that we are doing, whether it's enough or not, we will be the judge in the future. But this idea of driving those four areas of fires, integrated information advantage, how you're using counter targeting and other things, if you're out there and you're sitting still and you're a big target, you're vulnerable.

We have to start with those things and it's why Guam is such a critical place right now for the combatant commander. It's such a vital place for us to operate and that's why defense is so critical, and that's why the prioritization of things that will start on Guam is why the investments are such that they are. The next question is where do you go from there? Where's the next step? To hit Guam and protect Guam you can put some things in some places if they're fixed, we have to now defend them with more energy and more systems and that's going to take time and it's going to take money and you're seeing some of that come forward. But really the next question is, what's next after Guam? Is it Hawaii? Is it Washington DC? Is it the coast? Where do you put your next dollar to do that? I think it does require that we're going to have to get better at our ability to detect tracks and transition them from space.

There are a lot of efforts doing that. Some of it is HBTSS system, but there are also other things going on that will continue to push that because we don't know where those targets are going and who is really the defended combatant commander at any given time depending on where the trajectory the weapon is. All I can say is, the roles and missions piece is going to continue to be difficult as long as we try to do things jointly inside of the services. And that's why you got to have that driving paradigm of the joint war fighting concept to think about it and ensure that we all agree on how we think is the best way to do it. And then you invest in those things that do it accordingly. Will it be enough? I don't think we're ever going to have enough of anything in the current environment. We've got to start rethinking how we're doing a lot of this stuff with regards to ... It's not all about out-gunning or out-shipping or out-missiling the adversary.

It's got to be about how we do it conceptually and how we do it doctrinally and how we fight.

Mr. Riki Ellison:

Thanks. I agree complete with you that we shouldn't have an exotic architecture out in Guam and not have a prototype to put if we had to, Hawaii, or anywhere in the world. That thing should be developed that way at some point rather than an exotic one. Just because I'm concerned about the MDA not having representation at the DMAG or the JROC from the MDA director because he's not confirmed. Does that hurt MDA's position on getting the right funding in there? Is that significant?

VADM (Ret.) Ron Boxall:

I think you could make that same argument. We're in a weird spot right now. Hopefully that's going to be resolved, but I don't know if it will be or not. But it doesn't really change how you prioritize. Somebody's sitting in a seat, whether they're the right person or not. Senior's always better. You've got a lot of duplicity and people doing two and three jobs.

Mr. Riki Ellison:

Ron, we missed ya.

VADM (Ret.) Ron Boxall:

Did you lose me? Hold on.

Mr. Riki Ellison:

Yeah, we lost you. Can you just do that. Just to answer the question from the beginning again?

VADM (Ret.) Ron Boxall:

Yeah. Okay. I think the question-

VADM (Ret.) Ron Boxall:

Yeah. Okay. So I think the question was that I kind of lost you in between there. What were you saying> my batteries were dying.

PART 2 OF 4 ENDS [00:34:04]

Mr. Riki Ellison:

We were talking about not having because the confirmation issues, not having the MDA director in those critical meetings that hurt the budget process going forward. That was what I was asking.

VADM (Ret.) Ron Boxall:

So yeah, this is kind of unique time right now. Yeah. Look, this is idiotic what we're doing right now with our senior leaders because you have them doing two and three jobs, so no matter what, you're still going to look to whoever is acting as MDA as the person who's communicating to the organization as best they can. Is it optimal? No. I hope it's rectified very soon, but I don't think that has, it's not like someone says, well, let's go hit MDA because there's only an acting one star doing it.

I don't hear that and I don't see that. I think we've already got the direction when we have these meetings in the Pentagon portfolio reviews, the MDA director is represented by whoever's acting at the time, and then obviously the R&E under secretary for R&E is going to be there. Heidi Shyu is going to be able to communicate the priority as she directs or endorses from the MDA agency. So I don't think that's hurting. I think collectively across the board that's hurting everybody. It's very hard. Look at the Marine Corps right now. I mean General Smith who's filling two jobs now, he's gone and you pull one in just again, just do the two jobs again, it's just absurd how much it's really preventing our already hard job of trying to pace the adversary.

Mr. Riki Ellison:

Thanks Ron. All right, we got Mark. Mark, thanks for the London trip last week with phenomenal conference, phenomenal panels that we did together. I know we didn't get into the Aegis part of it or the BMD part of it. We were really strictly on the land-based part of it, but it'd be great to have you present here on the Aegis and on how powerful that is in going out forward on Guam. You were the former three for Indo-Pacom. You are definitely one of the rule experts in this area. So the floor is yours partner.

RADM (Ret.) Mark Montgomery:

I'm not sure if I'm an expert, but I certainly talk like it. So for the defense of Guam, I think we're at this point now where we actually have to get a series of Navy systems on island functioning and tested, and that's the SPY-7 slant, TPY-6 radar, whatever they've selected as their radar. Weirdly, they had SPY-6 and SPY-7 compete so that we could name a SPY-7 at TPY-6, only the Department of Defense could lock their head around that one.

Then the next one is the Aegis weapon system to control it and then some effectors SM-3 or SM-6 and do a test. And I think to do this right, to get this done at the end of 2024, the beginning of 2025, the Navy's going to have to take leadership in this. I like General Charlie Flynn at US Army Pacific, but he is not going to magically be able to take control of all these Navy systems, get the funding right, get these aligned to get them going. This is inherently a Navy process. The Navy's aversion to Aegis Ashore comes from units in Poland and Romania where we have to send people on TDY and it really negatively impacts the dwell time, the deployment time of land-based sailors, we won't have that trouble in Guam. I think the Navy probably overreacted initially to the idea of an Aegis Ashore in Guam, fearful of another TDY deployment thing.

Well, that's not what Guam is. We have submarines there, ship repair facilities. We have thousands of sailors and their families in Guam. And it's a pretty popular place, I don't think you have any trouble getting Aegis techs who are stationed in Yokosuka or Hawaii to come to Guam for shore duty. So I really think we overreacted on this, but now it's time for the Navy to take. I think they're going to be given the opportunity by the Department of Defense to take some leadership, get this installed initially and get a test going. And I'm not worried about integrating with the Army. Aegis knows how the Aegis weapons system integrates perfectly fine with that and patriot. There's a system called Link 16. I know when we were in Europe there was a little bit of a, maybe we're in, maybe we're out with about half the countries and half the country's not properly in.

But now the Army and the Navy actually can integrate across Link 16. So I'm comfortable and we have C2BMC as a situational awareness tool in the background. This is not a problem. I don't worry about IBCS and how it will slow things down because it's not part of this integration effort. If it would slow it down, which it would. But we also have to start thinking about some other things, which is about some low cost point defense systems. The Navy is going to be really excited to defend Anderson Airfield with this system and everything. I think it'll be postulated for that, but we're going to be absolutely fascinated with defending the submarine base. And to do that, I think we're going to have to have a local shooter and radar down at the base there and we need to start thinking about that and thinking about how you integrate it.

By the way, we're pretty good at this already. We know how to integrate Navy to Navy and Navy to Army systems. I think there's some shipboard Navy systems that could easily be put ashore near the submarine base and take care of that. And we may need something like that near wherever the Aegis C2 site is because as much as we say it's transportable or mobile, those things mean something to MDA that they don't mean to the rest of us in the world. They mean things that take weeks and months and we're thinking about hours. So we're probably reasonably fixed in some spot and we need to defend

that so that the Aegis system's functional because without it, the defense of Guam will fall apart. I'm not saying Aegis is the only thing that's important to the defense of Guam. I'm just saying it's the one thing I know the defense of Guam will not function without. And so we really need to protect that. I like what Tom said about hypersonic.

I think he's right. We have a very good terminal capability in the existing weapon system. Now I think all of us understand we got to thin the herd on this, and so we're going to need a glide phase interceptor program. And one of the things I'd say here is this is not a question of do you invest in offense or defense? We're a democracy. We cannot let an autocracy develop an offensive capability for which we have no defensive counterpart. Non nuclear, right?

So what that means is it's fantastic that we're spending 4 billion a year, three and a half billion a year on offensive hypersonics to match and catch, and I'm sure we will catch and pass eventually China and Russia and offensive capabilities. I have total faith in our primes to develop kick-ass systems that do that. The problem is you have to have a defensive system to counter a first mover authoritarian regime like China or Russia, and to do that, we need to be investing similarly in our defensive hypersonics. And right now the delta is 10 to one, about three and a half billion to 320 million. That's not acceptable. Now, part of that's driven by the fact that we're maintaining ourselves in a research and development status in hypersonic defense. And I think that's tied to a risk aversion and a lack of understanding that this is not your normal. We got to get a programmer record.

We have to do this exactly right. We have to dot the I's and cross the T's. We'll have this delivered by 2034. That's got to stop. We don't need a competitive environment at this point. If there's a country out there, if there's a company out there ready to deliver a product in the next three to four years, we need to bet on that one. And if another company comes on with another product, bet on that one. This is one of those times when for a lot of reasons that are too hard to explain in this podcast, we neglected the kind of investments that were necessary in hypersonic. It has to do a lot with how MDA is perceived services versus MDA, has a lot to do with because of INF, we were limited in how we developed things like this. So whatever reason we're at now it's time to push the envelope, take risk, invest in multiple, and let's say one fails, God forbid.

I know we don't let that happen inside the Department of Defense, but let invest in a program and fails. I would be pushing hard on whatever glide phase interceptor program is available right now, try to deliver something by 2029. Now that'll drive the cost up once you start buying munitions. None of this is cheap. I think most of the glide phase interceptor programs are like piecemealing things together from already expensive missile systems. So it's going to not be cheap per intercept, but this is one of the places where the enemy spends a lot of money on their outgoing weapon. So in the ROI, it is not that bad. So hypersonics to me is a big one, Riki, in that defensive Guam, but I did refer to something there, and that's the cost of investment. We need to get to lower cost interceptors. Look, I don't want to guess how much we spent off the Kearney several weeks ago versus how much the Houthis spent on drones, but I would say I would not be surprised if this was a hundred to one mismatch.

I would not be, and that should make us all uncomfortable. We need to figure out how to rapidly get to low cost intercept. And when it comes to drones, an answer I doubt it ever is, but it should never be a standard missile or even an ESSM. It needs to very rapidly get to directed energy weapons, something that is a much lower cost, and so we need to drive down the cost. Now look, as much as I say that to the Navy, I'm really talking to the army here because the army, when we say they have no cruise missile defense capability, what we're really saying is they don't have a cost effective one because patriot batteries are expensive as hell. We can't afford to build multiple ones and their effectors are $3.2 million around. That is not a cost effective cruise missile defense system against an adversary that produces things in the hundreds to thousands.

You must drive down your cost of the effectors. And then finally, on the defense of Guam, it'd be mistaken for me not to mention something you and I have talked about a lot, which I finally see the army breaking out of their JLENS nightmare and understanding that we're going to need aerostats or dirigibles some kind of persistent medium to high altitude detection system to really, I think what it does is it makes every effector on the island more effective. I know that's probably not grammatically correct, but it makes every likelihood of intercept higher and makes every likelihood of detection higher. That whole thing where I'm talking about having some point defense system for the submarine base, that's going to be really helped by a 20 to 30,000 foot sensor. And the Army has got great experience in this. I don't mean the JLENS getting underway into Uncle Fester's farm in Baltimore, but I mean the experience of actually operating it there, they've had the right radars up there.

The Israelis have copied us and they've put a system up. I think the Poles are now at doing that system, and I think the US Army, as long as we don't call it JLENS, they'll come around on this, but we really need to push them on this. This is the kind of stuff that really makes air defense more executable. So Riki, to me in Guam, that's the big issue is the Navy getting ownership, investing and hypersonic dropping down the cost per intercept and then getting some of the unique things that make you more effective and agile like Arista dirigibles. So pass it back to you, but those are my thoughts.

Mr. Riki Ellison:

Thanks Mark. And I think, not think, I've been told that the Secretary of Navy is now been put in charge of Guam to further your first point of having Navy ownership of that capability that the Army would fit under. But going to the test that just happened that we talked about, proving capacity is the issue, what are the ramifications for that? I mean, because that's basically saying, Hey, we need more munitions to do that, and then what are the ramifications of that test to Europe and how do we get IMD with Navy in Europe like we're kind of doing in Guam as a real solution right now with the current capability that's out there, that is the only solution that seems to be fully integrated and layered to be put whether in land or on the sea, but how does that work in Europe from your perspective?

RADM (Ret.) Mark Montgomery:

Two thoughts. First, on the question of munitions. Look, I just saw a letter from Representative Gallagher to the senior leadership of the Armed Services Committees and others saying, look, when we eventually do these supplementals, there needs to be a Asia Pacific supplemental of about 12 billion instead of the 2 billion that's really in there. Right now, when the president said 106 billion and there's 12 or 14 for Taiwan, 4 billion was about the summary industrial base, fantastic investment. That's not about anything in Taiwan or Asia Pacific in the next three or four years. That changes things a decade or more from now around the world. There's 2 billion for countering Belt and road initiative coercion. That's not really about this. Then that was left like 2 billion for FMF of which Taiwan would get some, they came back and said, 12 billion, here's why it's important. A big chunk of that was munitions and that gets it exactly the kind of systems that are involved here, SM6 particularly.

But there's other systems in there, Amram for potentially NASAMS but also Patriot and potentially eventually SM3. Unfortunately those are big bills. That's what really drives up the numbers and the cost of these munitions right now getting back to my thought on lower cost intercept. So we're going to see some movement on that and hopefully we'll see that in a supplemental that doesn't burden anybody's current budget, because one of the problems right now is the services are all for the Pacific Deterrence Initiative, right up to you recommend something they weren't already buying. Then they're like, whoa, hold on a second. And that was the same in the European Deterrence initiative when we had the same

thing going in Europe. The Army only bought all that stuff when they were given OCO money to buy it, and we all know that, but we don't like to say it out loud.

Services believe their programmer records are correct no matter what your strategy is. What we learned in Europe was important, which is that they do need, there's a lot, lot of cruise missile development systems going on there. Aegis is not going to solve Europe. Ships getting close to shore doesn't really solve this problem. All three of us understand the kinematics of that. There's some more that can be done with the two Aegis of shore sites, that's a political decision from NATO, which is like saying that's something that I'll go to sleep on for about 24 months. I'll wake up and hear if you've got an answer. So the reality is on this is we have to push them to be buying low cost systems there, and I think NASAMS is one, but you and I saw a couple of briefs on a couple others that are coming out, and to me there's a UK one. There's systems out there that we can push and get them to embrace, but most important is that everything's interoperable.

Europe of all places needs to be interoperable in this and they need all the other things. They need the E7, they announced the E7 while we're there buying the wedge tail. That was a good decision by NATO and then the dirigible. So long answer to your two-part question.

Mr. Riki Ellison:

Okay. I'd like to open up right now just between us if Ron or Tom have any questions, Mark, with each other and then we'll open up for the questions. Any remarks Ron, off of Mark and Tom's presentations?

VADM (Ret.) Ron Boxall:

No, I think a couple of things that I couldn't agree more about the airborne sensor piece, whether it's a JLENS like thing, I think the idea of putting unmanned that can keep doing some sort of thing there on a rotation. Again, I'm all about if you put something up there and it can be taken down easily. Again, that's one of my concerns why I think it's got to be something that can be supported in that way. But also we didn't talk about the PAC-3 missile. I think the MSE specifically, I mean there's things about that that I think are critical to compliment our inventory from the Navy side and also inside the joint arena. So we had some exciting things happen. I mean, how we get weapons out there. Look, we got a VLS issue out there right now and cells, every time we de-com a cruiser with 120 cells on there, you can't help but cringe a little bit that we've got to make that up somehow. I mean, if we're not making it up with either shore based, if we put it ashore, again, VLS ashore is going to be an easy target. But at the same point, this is a good place for unmanned to be. We just took an LCS out, we shot a missile off. I don't know if it was last week or littoral Combat ship designed to be... Really wasn't to be air defense at all. It was why we have the new frigate coming out that should punch in pretty well above its weight in this world as well. It'll carry the missiles. It has the same scaled-down SPY-6 radar.

Tom was critical to putting the capabilities on there that made that platform critical when it comes out to be complimentary to the Navy's piece. You look at today's strategy from Admiral Gilday as the CNO was sailors readiness, capability, and then capacity. I think we have to take a hard look at right now and see whether the new CNO will come out with a new strategy that kind of flips the model a little bit to say, look, we need to get numbers out there.

Munition certainly to Toms and Mark's point is going to be a key part of that. And the last thing I wanted to bring up that I don't think we touched on was... No, I guess we got to it. Yeah, so I just think that Mark's spot on. I mean, we're all in love with offensive weapons because we like that and certainly there's a need in the hypersonics world for us to do that, but we certainly should be taking this opportunity to get lower speed or lower cost weapons.

Yeah, I was thinking the same thing with Carney out there. I mean, you don't want to be in that cost curve trade-off of a 100:1 or 20:1 or 50:1 or even 2:1. We've got to get a series of lower costs, smaller systems, and we always had kind of CWIS was our weapon of choice in our day back when it was a Subsonic cruise missile problem, you had a somewhat decent shot these days you need much higher speed systems and probably a little more range, but they don't necessarily have to all be double-digit million type of weapons launching at a 3D created drone.

PART 3 OF 4 ENDS [00:51:04]

Mr. Riki Ellison:

Tom, you want to?

RDML (Ret.) Tom Druggan:

Yeah, I think to wrap up, I think it's important to recognize that in the modern world, if it's not a nuclear exchange, it's missiles are front and center in terms of being weapons of choice, no question about it. And then now you have drones as a new aerial threat, but that is the weapon of choice. We're seeing it and it's not just pure competitors anymore, right? Cruise missiles can be developed by many countries, have been developed by many countries, and now there's an export to terrorist organizations or non-state actors. That just brings a tremendous amount of risk and danger where you have independent actors now armed with modern missiles that have their own agendas and can launch them.

So that's a new element in terms of national security and the problem's not getting any easier. Modern threats from the high end countries that are traveling at Mach three non-subsonic, and the future, again, fobs, hypersonic line vehicles, maneuvering any ship, ballistic missiles, it's only getting harder and you have to have some level of robust. Lots of times you talk about left of launch and we've got to get after these weapons and these threats early. We know that's hard. A lot of these are truck mounted. We know that finding them and killing them is difficult, but we got to do that, but we still have to have the ability to... Whatever does come, we got to be able to counter even if it's only a percentage [inaudible 00:54:56]

Mr. Riki Ellison:

MDA's got to develop a lot of that or where do you think MDA's role is in this?

RDML (Ret.) Tom Druggan:

So, well it depends on which service, and are you talking land warfare fair? Are you talking [inaudible 00:55:08] the threat? Yeah, so there's no question that MDA has to stay at the forefront of the research and development, in terms of threat assessment, evaluating our capabilities, our limitations, identifying our gaps, and then what to do to get after it. Now some of that will be MDAs job to get after it. In other cases though, it will be the services and every service is motivated to defend their own forces. I think that's very clear, right and proper. It is probably also making the systems we have more robust, particularly for those that are directional, really important. Now the army, there used to be a front, so they could have air surveillance that was forward. Now it's 360 degrees. So they have to come up with systems to give them that information advantage, give them that surveillance awareness 360 because now it's not just at sea where we have that problem. It's a short, there is no front anymore in my personal view.

Mr. Riki Ellison:

Hey Mark, are there any questions that you'd like to push out?

RADM (Ret.) Mark Montgomery:

Yeah, there's two quick ones I think we can get done for the top of the hour. The first is, I'll take the first one and I'll pass the second one out to the group. The first one asks, how are we doing on getting distributed radar and launcher sites integrated? I think they're talking about defensive one with Army systems. And I'd say first I think Congress helped out and said let's buy a VLS anyway. I think we ended up buying multiple VLS. As a kid I played Missile Commando, so I was always really good at protecting my missile dumps, especially against the hypersonic green one that we've dropped down fast. So I'm really comfortable that, I think that's a good mix. I think the Army's struggling to deliver the truck at the cost. I mean not Army, but the prime and everything. I think it was getting a little expensive.

I imagine they'll be with VLS. I think the tricky thing's going to be... And look, I was as optimistic as everybody that you could split a SPY-7 up and spread it out and everything would talk to each other pretty well. My guess is things are always a little harder when you get out in the field. And so that might take a little bit, but honestly, I don't think this is an issue. I think it's integrating with itself, getting that right and then integrating with the Army is using a known link, a known system. Look, right now we can't do fire and quality track data solutions like we can with Navy units and CEC. But over time, there will be an evolution and how systems talk to each other to get every sensor, every shooter talking to each other in a fire control quality discussion.

We could have had this 30 years ago if the Air Force had come around on CC, but that's an old fight. Hey, so there's one question for either Tom or Ron to pick up. It's a good one. Is there a program to think about how we incorporate this investment where we're about to do apparently a $1.2 billion RD investment in iron beam into US missile defense systems? And if not, what do you think are the opportunities for directed energy for us?

RDML (Ret.) Tom Druggan:

So Ron, I have a little bit, but definitely as your joint experience, you have greater visibility. So we all want the infinite magazine. We all want it. We can't have it yet because of physics, and it's going to take time. We need the resources. We need world-class physicists and engineers working this problem. And there's several. It is particularly difficult for the Navy. And the reason it's difficult is we're in a maritime environment. We have very dense, heavy air at the lower levels called evaporative duct, and it just sucks the energy out of directed energy, weapons, lasers in particular. And you get effects called thermal blooming and things like that. So we have a harder problem. That doesn't mean it's not worth pursuing, but our problem in terms of effectiveness is higher.

Also, we have to recognize that the threats have a vote. We have to get down to an almost instantaneous effect because the missiles are moving through the air. The missiles are weaving, they're doing spirals. The ability we will not have the opportunity to keep a beam on a threat for multiple seconds. It's going to move. It's just not that hard. And at that point you end up heating lots of parts of the missile, but you never break through. You never get to it. So thankfully there's other directed energies, radio waves, RF, things like that. Or you can go after the seeker. That's an advantage we have at the Navy is any threat that's coming after us has to have a seeker to find us and target us. So we could spend time and money on directed energy there. High altitude would be wonderful, and particularly in ballistic missile defense, if we get one that's long range enough, then we can start to deny ballistic missile attacks during the launch phase.

That would be ideal. That was what the airborne laser was all about. The science and technology just wasn't there. So we got to keep working that problem of what's the physics, how do we get high power?

So we need really super dense power sources. We have to be able to stabilize that beam. We have to keep it fixed on the threat while the aircraft is moving through the air. We have to be able to correct for the atmospheric pieces, and we have to be able to have, again, very high power to be able to burn through. Which that high power density, we don't have the power density yet. And heat waste. Lasers are not efficient today. The amount of waste heat they generate is very large, very, very large. And so we have to get to more efficient lasers.

So we just have to attack this one technical barrier. We actually, we have to attack all the technical barriers at the same time. Otherwise, you'll end up with advances in some areas that we need the whole package. So we all want it and it shouldn't just be lasers. It should be directed energy in general. Power density, cooling and getting rid of the waste heat. Absolutely critical. And those are pretty mundane, but absolutely critical. Beam stabilization and power on target. So that's my thoughts on why it's hard and why we don't have it today. The investment is absolutely vital.

VADM (Ret.) Ron Boxall:

And I think the only thing I would add... You nailed it exactly what the challenge is. But we've got to start somewhere. And part of it is the high-powered microwave I think is showing a lot of progress. The electronic warfare, other systems that are... And again, there is some other capabilities that we were looking at that I think are showing good promise as well. So we have had some very great success and some more difficult cost curve. Even a success is a failure if you're on the wrong side of the cost curve. So we've got to balance that hard kill with some of these other things. Everything's got to be sensed. So sensing is easy. No matter what you're affecting, you have to sense the target if you're going to get some effect on that target. So to me, that's the easy one.

The much harder one is trying to figure out where in the detect engage sequence do you really spend your energy? I think there's got to be some more on the front end. And again, this is the offensive piece of fires. You have offensive and defensive fires. I think it's always been a church or state. I think when you start looking at high speed weapons to go after truck mounted weapons, you can do things with that in the front end if you're tracking those targets.

RDML (Ret.) Tom Druggan:

So ultimately, I think it's complimentary. I don't think it'll ever replace all kinetic.

Mr. Riki Ellison:

I would love to see it on dirigible with power with new.

RADM (Ret.) Mark Montgomery:

That's a lot of power up in the air. Hey Rick, I think we got through everything there and we've all said our closing things. Pass it back to you for any final thoughts.

Mr. Riki Ellison:

Yeah, no, the test MDA did showing the capacity requirements for us is huge. It validates what we're doing for the current capabilities now. It's going to be hard to fund it and all that, but it's got to be done to be able to continue to our new weapon systems come forward. So I think that's huge. I think it's huge for MDA who should not be getting cut. And how many people on that test were involved with that. That's a couple of 100, I would assume, or more, and how valuable those guys are and how valuable MDA is, and how valuable the Aegis Ballistic Missile Defense, Integrated Air Missile Defense System, you

guys don't get enough love. It should be out. It should be out and about and it is. And we don't want to have these ships lined up next to islands like Lucas may be doing.

If we don't have VLS on ground, those ships are going to be assigned, and that's not the way to do this. So it goes back to you Ron, on the overall, getting the roles and responsibilities back. We're going to have to figure that out. Spending little amounts to be able to do this. You're not get that problem done right. So great discussion. Appreciate each one of you guys here contributing to that. You're on a great mission. It is coming. We got to speed it up. We got to speed it up to get it done. And we all know you got to have a layer of defense to win the world championship, and this is about winning the world championship here for the future of our nation and the future of the World. World Championship starts with a defense layer. That's it. Thanks guys.

RDML (Ret.) Tom Druggan:

Thanks.

Mr. Riki Ellison:

Thank you.

PART 4 OF 4 ENDS [01:05:09]