

Mr. Riki Ellison:

Welcome and good afternoon ladies and gentlemen from a real crisp, clear winter day here in Alexandria, Virginia. I'm Riki Ellison. I'm the founder and chairman of the Missile Defense Advocacy Alliance. It's 20 years old. With the singular mission and passion of advocating and educating for missile defense in the deployment of it, the development of it, to make our world and our nation safer. Today, we have our 47th Congressional Roundtable, as we call them, on missile defense. We have excellent guest speakers here with us. I mean, I think everybody's been on this a couple times already in uniform. They're out in uniform today. So we're really excited to have recently retired Lieutenant General Neil Thurgood and Rear Admiral Tom Druggan.

Let's start off with how serious this subject matter is. This morning, Russia fired 76 missiles into critical infrastructures in Ukraine. Most of them cruise missiles, most of them coming from their Tu-95 planes. 40 of them targeted the capitol, Kiev. This is their ninth wave of firing 70 plus missiles. Earlier this week on Monday, China flew 18 H-6 bombers into the Taiwan airspace. This falls of persistent harassment in that area where it's highlighted on August 4th after Nancy Pelosi visited the island where they flew 69 planes. 49 of them into that Taiwan zone. Since August, North Korea has fired 51 missiles, most of those short range and below. Since February, Russia has fired over 5,000 missiles.

This is modern warfare. This is the 21st century way to fight. It's defined by a couple things. It's defined by persistent surveillance for almost everything can be seen and everything that is seen can be targeted and everything that's targeted is done by precision weapons. The opponent is using long distances across all domains, air, land, and sea, to reduce its vulnerability to counter attack. We're seeing this, and what I just earlier said on cruise missiles and ballistic missiles and some hypersonic missiles that are soon to come forward. We're here today on what really is the implications of critical national infrastructure being pounded in Ukraine.

Do, we, the United States of America, does Europe, does Ukraine, does India, does Australia, does Japan, do they have an integrated air and missile defense layered capability to defend against this modern warfare threat? That is where we're at. And we'll have our speakers that are top notch. We're very honored to have both of them with us. I'm going to start off with Rear Admiral Tom Druggan. He's a senior associate with CSIS. But most importantly, he comes from the last legacy item of being the program executive as a naval flag officer. We started that program with Kate Page almost 10 years ago, Tom. Tom is now the last of any US Navy Admiral active to be part of that leadership on it.

Within that program, you've seen one of the best in the world or the best in the world, 360 missile defense capabilities from C level all the way in to space. Tom has certainly done some remarkable achievements including the SM-3 Block IIA interception of an ICBM. But I think most importantly, Tom, there's a lot you've done with the radars, but really it's what's going to happen in Guam, and I think you've been a leader in creating that critical thought and insight in application of what's the best capability we can put in there for an integrated layered missile defense capability for US homeland in that situation that is in Guam. Tom is just recently retired and we're very excited to have him back. Ladies and gentlemen.

RDML (Ret.) Tom Druggan:

Thanks. Thank you very much, Riki. Honored to be here. Obviously, I didn't do it. The Aegis BMD, sea-based weapons system, the team down in the Missile Defense Agency is fantastic. That's continuing.

They're certainly producing capability and delivering it to the fleet today, and we know that. I feel good about that and we all should. Let's talk about long-range fires here for a second as we try to understand why this is new and different. Before, if you go back a while, it is really, when we think of ranges, the first kind of indirect fires would've been in New York City to Newark, New Jersey. Then it would've been New York City down to Philadelphia, 100 miles or whatnot. Then it would've been New York City down to Washington, DC. Those are the fires that we've been used to, those ranges.

Yet today, now it's New York City to St. Louis, Dallas. So all of a sudden, there's been this huge leap. That creates a war fighting challenge that's now present. Certainly, our potential adversaries are working on them. They have tested their way to a capability and there's no question about that. What that does is that means a couple things. On the ground warfare side, that now there's no traditional front with these weapons that can not only do they have long range, you can use some of that range for maneuverability to come around behind forces. The front is now mutable. That changes how we need to fight on the ground warfare side.

Then it also means that there's no sanctuary. The sanctuary, the logistics hubs, you just be able to keep those outside the range of the enemy fires so they were safe. So you could have a sanctuary for your logistics, your personnel, your staging or your ammo, all of that. And now from a tactical perspective, there's no sanctuary for those implements of war in the tactical sense because now the sanctuary is back at the homeland. What that means is it takes time to get ammo and logistics and people and forces forward. That means that our expeditionary forces have to be more independent than ever. As we look at the long range fires, it's going to take more than unit level tactics to defeat this kind of capability on the defensive side.

The long-range fires, whether it's hypersonic or ballistic missile threat or long-range cruise missiles, those do change how we're going to have to adapt and fight both ground warfare and also naval warfare, particularly in the Western Pacific. That sets the stage of, "Well, what do we do about it?" These are tough challenges. They're not impossible. Against many of them, we have adequate and effective defenses. It's particularly true down in the naval cruise missile range and then the ballistic missile side of the house. Hypersonics being the newcomer. We do need to tweak our current radar systems to make sure that we can detect and track those threats.

And they're very important in this range, given just the vast area that we're talking about, is to not only get track custody of a threat but to then keep it and be able to hand it off. Interoperability and integration now become an imperative. They don't enhance the force. They're now necessary for the survival of the force. That's going to be a very important consideration wherever you are. We're going to have to rely more and more given these kind of threats on a few things. How do you survive this kind of threat? One is you can certainly avoid, you can avoid the strikes through maneuver by denying the enemy their surveillance, their scouting. And that's certainly a fruitful path.

You always have to be cautious that you don't believe that you've denied all of their scouting capability, and there might be some residual capability that may be enough. You also have to deny them by deception. Operational deception's going to be a new old art form. We used to be very good at it with operational deception. It's got to become a part of our routine, certainly on the naval warfare side of the house. The reason for that is these kinds of long-range missiles, they are expensive. And in the naval warfare sense, they all have to have a secret to find their targeted sea. So that makes them also more expensive.

As a result, they'll be many of them, but there will not be tens of thousands of them. What that means is that gives us options on how do you track the stockpile of the enemy while preserving your forces. It does open the door to something that we really haven't had to deal with in a long time, enable warfare, which is the fact that we're going to have force on force level attrition as we have a conflict and as we go into how to deal with battle damage and survivability of not individual ships and platforms and things like that, but of the force to maintain a fighting force, that'll be absolutely critical.

Past this prologue here to some extent, we did many of these things in World War II. We didn't have a need for many of them and they're revived during the Cold War to some extent. But now, it really becomes a priority on how to address this kind of long range fires threat. Every now and then, you do have to have a forward logistics hub or staging area. And Guam is one of those for the United States of America. Not to mention that it's a US territory with over 100,000 US citizens on the island. At that point, you have some different choices. Clearly, we have to defend Guam. And to defend it effectively, we're going to have to invest in that.

We'll see where the budget goes this year. I personally think that has critical infrastructure there. Having the capability to defend against cruise missiles, hypersonic missiles, and ballistic missile threats will be important to the viability of Guam as a staging area in the future. If nothing else, you have to have the level of capacity there to at least buy time. The defense of Guam has, I think, personally a dual purpose. One is to deny any attack from North Korea, but the other is also to deter any Chinese Communist party activity against Guam. We raised the threshold to ensure that that happens. There's a couple groups for you out of the gate.

Mr. Riki Ellison:

Tom, you well-articulated the defense of the carrier group and the Navy capabilities. I think you're ahead of the game in the world on that ability to do long distance fires defense for your fleet. But now putting that application on ground like you're doing in Guam, A, is there applications for that to go on somewhere else besides an island like United States Homeland, like Europe? And B, your command and control is so good that we're using it right now on land for that purpose. So I'm asking, and I think we have a struggle with roles and responsibilities of maybe versus the other services for that application of what you're doing. Can you just elaborate a little bit on your C2 system and land application of the Navy defense capability?

RDML (Ret.) Tom Druggan:

Sure, happy to. First, for strike groups at sea, these are carrier strike groups at sea, as well as expeditionary strike groups at sea, typically there's a number of Aegis ships. The Aegis ships provide long range surveillance and the ability to act on that data. Long range surveillance as well as long range fire control for us. An assortment, frankly, of weapons that come out of the vertical.

Mr. Riki Ellison:

And there's no gap there. I mean, you've got capability today...

RDML (Ret.) Tom Druggan:

We do. We have excellent capability today. For cruise missile defense, some hypersonic missile defense and for ballistic missile defense. On the hypersonic piece, there's some additional kinetic kill weapons companies, glide phase interceptor out of the Missile Defense agency is one of those. Then of course right now, you're seeing, certainly proposed considerable investment in things like directed energy to include lasers as well as cyber capability to do left to launch or add to our ability to do operational deception or decoy kind of things. There is an excellent capability there.

It is important to note that it's 360 degrees. From the horizon all the way up to the zenith. So that gives you excellent surveillance, particularly when you have several. What's important about the naval warfare, many people are familiar with the joint system, the Link 16, that provides the ability for the joint force to share data. Within the Navy, we have an additional system that allows us to trade fire control data on a local level. What's important about that is that means that if I don't have an optimum sensor geometry but you do, then I can use your fire control data for my missile.

And so that gives you a level of resiliency and robustness for the defense of the strike group at sea. Either ships provide not just... Obviously, they're defending themselves, that's not their most important job. It's a critical job. But the reason we have Aegis ships is to provide area defense, which would include aircraft carriers, high value units, things like that. Now we've gotten to the point where Aegis is providing a force level defense where we can shoot smart missiles over the horizon using third party targeting. And we're even now being able to defend our forces' friends and allies against very long range ballistic threats.

And so the SM-3 Block IIA gives us that long range capability with an additional layer with the SM-3 Block IB. In the Navy, we always believe in layered defense. It's a critical aspect of naval warfare to be able to trade an enemy raid, a big raid, over time and battle space, and be able to trade it so that the force can survive. Multiple ships are important so that they can leverage each other's weapons and sensors for defense of the force. We have a new system coming online with DDG 51. Earlybird class, amazing ship building program.

We're now doing the flight three upgrade. We had the original flight ones, we had a flight two, we had a flight 2A configuration, and now we have flight three. Flight three, we'll bring with the Aegis Baseline 10 with the SPY-6 air and missile defense radar. This will give us the option on the naval warfare side of the house to enhance and advance our CONOPS by using the capabilities of that radar in its C2 suite. So that's just going to make it better. But those will come in ones and twos here in the 2020s as a ship building program for the flight three ramps up.

The final piece is space. Very important already that the Navy has an excellent relationship with Space Force. The survival and the ability for the Navy to project power is enhanced by our space capability. Super important. More importantly, not more importantly, but also importantly is we provide sensor data to the Space Force. That could become, as a forward stage force, forward operating force, we could provide some pretty exquisite queuing to the Space Force for threats that are regional.

Mr. Riki Ellison:

You're so good. I mean, you are the best in the world, this ability to defend against long distance fires

and give you a lot of credit for the Japanese, being able to do those multiple shootdowns with their capability-

RDML (Ret.) Tom Druggan:

Historic.

Mr. Riki Ellison:

Historic on that.

RDML (Ret.) Tom Druggan:

Absolutely historic. We'll talk about that.

Mr. Riki Ellison:

You're so good now that our land components like Guam want your ships to be stationed to defend Guam right now to help the defense Guam. My question is transferring that capability over the land, which I think we're trying to do some of it in Guam, is that going to be-

RDML (Ret.) Tom Druggan:

Well, we're going to see the answer here with the 2023 budget. What the investments are and what part of the military's doing what. As we know from the NDAA, the Army's been assigned the Cruise Missile Defense Mission for Guam as a plan. Obviously, the appropriations has their part that they need to do. And the Navy... Not the Navy, but the Missile Defense Agency has been assigned the portion of the mission that is hypersonic missile defense and the ballistic missile defense. The Missile Defense Agency's been working on an architecture for that. But at the end of the day, you not only need the authorization, you need the appropriations to be able to move that football down the field.

Mr. Riki Ellison:

All right. That's good stuff. I mean, it's pretty-

RDML (Ret.) Tom Druggan:

What we do know is just as effective. It's effective for hypersonic missile defense and ballistic missile defense. And it's affordable because we already have a large install base of these systems. So it's a marginal cost to add.

Mr. Riki Ellison:

And your Baseline-10 engagement remote launch, I mean, the network is just...

RDML (Ret.) Tom Druggan:

That's right. So the Navy is now fighting at the network level like never before. We're doing it with air to air missiles, we're doing it with sea-strike missiles, we're doing it with ballistic missiles. And we will certainly do it with hypersonic defenses as we move forward into the block phase interceptor.

Mr. Riki Ellison:

Those are big boots to fill there. Neil, coming at you now with how great the Navy has done with this mission and application of it and real ahead of the threat, been driven on this since early '70s.

RDML (Ret.) Tom Druggan:

I don't know, but congratulations to the Army for this past weekend with their win. Well-deserved.

Mr. Riki Ellison:

All right. Our next speaker is one of the best, I think, in the game. He is just retired from being the director for Rapid Acquisition for hypersonics directed energy and space. He has also been the test director for the Missile Defense Agency. He is one of the most innovative, strong, out front leaders of our Army. There are going to be some great legacies coming from his leadership and directed energy, I think, with the 150 or the 350K coming out of there. Your MRC capabilities is going to be awesome. He's a big thinker and he's a leader in that. He's been in the Army since '83. I want to give a little shoutout for his University of Utah education and the Runnin' Utes on top of the compliment that Tom just gave you for that game last weekend. So ladies and gentlemen, Neil Thurgood.

LTG (Ret.) Neil Thurgood:

Thanks, Riki. You guys here and see me okay?

Mr. Riki Ellison:

Yep.

LTG (Ret.) Neil Thurgood:

All right, super. Well, listen, it's great to be here today. Tom, it's super great to see you. For those that didn't know, congratulations, Tom for his first grandbaby. That's super great. Welcome to the world of grandpas. It's super fun. It is great to be here. Riki, we appreciate your leadership and putting this forum together to start the discussion and to inform the discussion. We got some hard decisions in front of our nation as we move forward and this is a key part of getting that conversation going. I'll pile on with some of the things that Tom said. Tom is a good friend. We were together in MDA, went along with Vice Admiral Wolfe. And I will tell you, the things we did together and learned together was super impressive.

You mentioned Japan. I remember sitting in Pearl Harbor on a Aegis cruiser getting ready to do a shot. I remember standing there on that Japanese ship in Pearl Harbor going, "If our grandparents can see us now." Really quite the great work that, Tom, you and your team have done and the MDA team. Let me paddle on a couple of thoughts here. Number one, we do live in interesting times. And at the time when

our technology's actually outpacing our policy. The time when we're trying to do things at pace with our adversaries and some of it's catch up, some of it's leading, and there's a mix in between there where we are.

But in all cases, we are in a place in history where our policies, though made soundly and based on history, probably need to be adjusted as we're moving forward. There need to be adjusted because our adversaries, our peer competitors that Tom talked about, they have a different value base, they have a different policy base and they have a different set of rules at which they're going to fight. We have to adjust and understand that. In doing that adjustment in our policies, we've got to make sure that we ensure we keep the moral high ground. And how do we do that? How do we put policies in place that keep the moral high ground for our nation and for the global community?

How do we do that, maintain our freedom of action, both economically, diplomatically, and of course in the military? Then how do we institute a positive global change in this modern warfare, Riki, that you started the conversation with? I think all those things are things we have to address as we move forward. For those that have served in uniform or studied warfare in any fashion at any level, you know that you have to do things in multiple ways. Tom used the word layered defense. As a ground soldier, layered defense is how we survive. Kill things far away as you can and keep killing them until they're close to you. Trip the enemy's ability to bring harm to our forces.

How do we do that? It's not complicated. Multiple dilemmas for the enemy, multiple timelines of dilemmas, and multiple avenues of advance for the dilemmas. Think about how we do that in missile defense and how we do that with offensive structures and missiles. I get asked the question all the time, "Well, do we actually need a sea capability, a land capability, and air capability?" And my answer is absolutely yes in all three, both in the offense and in the defense. Because there is no perfect weapon for any perfect day, and so we have to be able to assume that the enemy's going to get a vote and we have to have multiple ways to solve the problem.

When you talk about long distance fires, traditionally, for the Army, and I'll say when Tom and I were lieutenants, in the Army, we had the Persian missile systems. We backed away from those systems out of the Army. Those were long shooters. And now, with the start of offensive hypersonic weapons, which was a responsibility that we had in our organization to begin for the Army joining with the Navy, and then the midrange capability for the Army brings the Army back into strategic fires. In the realization of that entrance back into that domain, I'm going to reiterate something that Tom said. We no longer can fight as individual services. We must fight both vertically integrated and horizontally integrated.

The command and control structures that we have, that we've been fighting with as independent surfaces are no longer sufficient. We must change. If you look at the Army and the hypersonics, we adopted the Navy system. We didn't make our own, we adopted the Navy system. If you look at the Army and the midrange capability, we adopted the Navy system. We have to get beyond traditional parochial approaches if you want to be an integrated air and missile defense, meaning the ability to do offense and then defensive fires simultaneously on the battlefield. Because as you articulated, Riki, that is the future. It's no longer a defense, it's no longer an offense. There's no longer a four line of troops, as Tom indicated. The battle space is everywhere.

Because of battle spaces everywhere, you need integrated offensive-defensive fire simultaneously. Tom mentioned third-party command and control. I'm going to expand that a little bit, Tom, and you can pile on if you choose to it. It's not just third-party within our services, it's third-party with our ally or partner

nations. We have got to adjust our policies and our processes, particularly in foreign military cells if we want to take advantage of the global strength, not just the US strength. I think anybody would tell you that the future fight is not a US-only fight. And we see that happening right now in real time in Eastern Europe, the global community contributing to that.

So if you combine that interoperability, which is an imperative, and I agree with Tom, it's not just between us that are wearing a US flag on our shoulder, it's between us and our ally and partner nations. And we've really got to open the aperture of that conversation if we want to move at pace. Then the last thing I'll just mention, which I think is critically important to all of this is Tom did this one as a PEO. We tried to do it in the RCCTO. We have got to approach the acquisition of material differently. We tried really hard in the RCCTO to show the Department of Defense a new way to think about doing business. We have to stop waiting to be perfect.

I tell you, our sailors, our soldiers, our Marines, our Space Force, our airmen, they are smart. They can adjust, they can adapt. We can get them equipment and they'll show us how to use it better and faster than we ever thought possible. We've got to adjust the way we do business as we look at this nation state war. Then the last thing I'll say and, Riki, I think you mentioned this, in modern warfare, if you believe that persistence overhead surveillance is there, if you could do that, you could target. If you can be seen, you can be targeted. If you can be targeted, you're probably not going to get a second shot. That's modern warfare.

The amount of destruction that's going to happen in modern warfare nation state on nation state is what we saw in World War II. That's where the future is, and we got to be prepared for that. We've got to work past our policy problems, we've got to work at integrated solutions. I got to build to call the Navy and go, "I need you to shoot this missile. You can't see it yet, but it's coming. Get ready." And they got to be able to do the same thing for me. They got to be able to call the combatant commander or INDOPACOM has got to be able to call an Army unit, say, "Put a hypersonic weapon there. We need a target there. We need it right now." Those are new things we haven't done that we have to practice both procedure and policy to make happen. And I'll pause there, Riki.

Mr. Riki Ellison:

Okay. Thank you, Neil. Two questions. One is how soon can... Well, this integrated C2 where you can play with everybody, with our services and with the allies, is that more important than getting capacity in to be able to do that first? And when is that going to come? The second question is, there is capability today but it's expensive shot per kill capability. When is our cheaper revolutionary DE, jamming, all that stuff coming, how long do we have to wait? It seems like it never comes. We've been asking for this for quite some time. So there is a window here and you're seeing INDOPACOM, you're seeing UECOM demand capabilities and then DOD doesn't want to invest too much because they're investing in the bigger feature capabilities. I mean, you're right in the middle of that. Those are the two things I would like you to...

LTG (Ret.) Neil Thurgood:

Thanks Riki. Those are both great questions. On the first one, if you can use more people's assets, you automatically increase capacity and capability at no cost. So if I can command and control more and get more integrated into it for missiles that aren't exist, then my marginal cost is small. I would think that

the C2 piece with our ally or partner nations and across the services, as Tom was talking about, is critical for us. It automatically increases our capacity and our capability.

Mr. Riki Ellison:

What's the biggest challenge for not doing that? Why aren't we able to do that quicker?

LTG (Ret.) Neil Thurgood:

A couple, Tom, you might want to pile on here. I'll give you a couple-

Mr. Riki Ellison:

I got a couple-

LTG (Ret.) Neil Thurgood:

... thoughts. So the first thought is we didn't think that way in the cold war. We didn't think as we're talking today, right? It's easy to look back and go, "Well, why didn't we?" I don't know why. We've matured in our thought processes. So we didn't design the weapon systems to do that. The Patriot weapon system in the Army was designed to be used as a standalone weapon system. We're not there anymore. Now we've got to put it in a network environment, got to put it in what we call in the Army, the Integrated Air and Missile Defense Battle Command System. That's got to be able to talk to the Navy system. What was started as weapon systems to solve particular problems now have been expanded to be in a network environment. So we have to do that. We just didn't think that way when we're doing the buildup in the Cold War.

The second part of that is the way we build weapon systems today, and I'll just say modular is significantly different than we've built them parochially as individual weapon systems. Their ability to network is now different than how we originally constructed them. Those two things allow you to think differently about the application of capability not in a standalone piece. Tom, you want to add to that?

RDML (Ret.) Tom Druggan:

Yeah. I think it's really important here that we spend a couple minutes talking about the difference between command and control network and interoperability and fighting at the network level with the fire control capability. So one is common operating pitch. The command and control is a common operating pitcher, situational awareness. It's actionable to some extent but falls short of what you need for weapons control. It falls short because either the data's late, the data's intermittent, and even a couple seconds is intermittent when it comes to weapon control, or it's just time, it's just time late. It's late, it's not accurate enough, or the updates aren't close enough together.

That kind of detail, very important for the commander to have that information for situational awareness to prepare for action. There's a different network by which we can trade data and I can shoot off your sensor data or needle sensor data. That's a different because that's a real time problem. And that means I have to have very accurate, very quick data. The command network for common operating

pitcher and situational awareness, much more achievable and quickly. Actually, we're there in a number of different areas. C2BMC is a good example.

Mr. Riki Ellison:

Is that with the allies too, or just within our services?

RDML (Ret.) Tom Druggan:

Well, it's actually expanded to with our allies. A good example is both RIMPAC, which is a huge... I'll talk about Navy because that's my domain. RIMPAC, all the rim of the Pacific nations, many of them come to that and we work on interoperability. My experience there is a few years old. More recent though with the number of NATO countries and it's actually bigger than NATO, it's the Maritime Theater Missile Defense Forum. They get together every two years and there's an exercise that's called Formidable Shield. This is run at the range off Hebrides, Scotland as well as there's an associated range off Norway.

During that, in the beginning, it would take days and days and days just to get at the network, the C2 network up stable, reliable. Because we worked with the allies every other year for a number of years now, literally the Navy's come together. And we're talking 10 Navys, 16, 18 ships, come together, and within a couple hours, they have an effective and reliable network. That's what's important about working with allies over time. Periodic touchpoints and reoccurring periodic touchpoints become really important so that the capability is not episodic. It's actually an enduring capability over time.

So if push comes to shove and we need to come together as an allied force or even... An allied force, then we can share that command and control piece. That gives you effective command and control. Very helpful. Because then you can get command direction, you have mission command, you can get into execution very quickly. Fire control is just harder. It's just fundamentally harder. And the biggest difference is system to system engineering is required to connect the fire control dots. Otherwise, you miss, and missing is not allowed. I mean, we have limited stockpiles no matter where you are. Certainly, in the tactical sense, you have what you have with you.

Every round and every missile that you shoot's got to be effective. Knowing that if I have a fire control network, that it supports my fire control, that gives me the confidence to shoot off third-party data. What are some examples there? We've been doing that for a couple decades. We've added now land-based TP2 two data supporting Aegis ships at sea for the Ballistic Missile Defense Agency, that's probably engage on remote capability. So that's another one. We've done some demonstrations with PAC-3 and Aegis, that can be done. The fundamental engineering's been done and the requirements are there. It's a matter of turning that on and actually doing the coding. What that does is that it allows the PAC-3 to use the Aegis radar data. Pretty good, right? We also have the THAAD Patriot.

Mr. Riki Ellison:

The THAAD C2?

RDML (Ret.) Tom Druggan:

Yeah. We have the THAAD controlling the THAAD-Patriot Integration. So you're seeing it happen in different areas.

Mr. Riki Ellison:

That's going to come in Guam too, I would assume.

RDML (Ret.) Tom Druggan:

I think you'll see a number of those systems that you can combine to-

Mr. Riki Ellison:

Is there a country that we're doing this with yet? That we can share fire control like this? Or is it just still within our own services to be able to-

RDML (Ret.) Tom Druggan:

Well, right now, it's a US capability, but I would say I have to get into the details of each of the FMS cases. Currently, we've sold THAAD, which has to TP2 radar. We've sold Aegis. We could certainly do fire control exchanges with the Japanese, which we had demonstrated. And that should be true for the South Koreans and the other Aegis Navy's in the world.

LTG (Ret.) Neil Thurgood:

I think you see that same for the ground side. Whether I'm interoperating Patriot or THAAD with a ship or an aircraft or allied nation. I think what you're pulling at, Riki is, and I think Tom is getting to this point, is it's not global and universal. That's where we have to get to. It's not global and universal right now. We can do it when we need to. We know how to do it. But we've got to get it global and universal.

Mr. Riki Ellison:

But not like NATO or GCC or... Because we have so many different systems. We share these systems engineering across the globe.

RDML (Ret.) Tom Druggan:

I think we are at the Command and Control. The fire control level is just a heavier lift and it's not easy. Don't ever think it's easy.

Mr. Riki Ellison:

Would that be eliminating or just going with US systems or the Russian systems that some of the Eastern European allies have to make this easier or...

RDML (Ret.) Tom Druggan:

So somebody has to have the will and frankly the resources to go after something like that in particular. And it's got to be driven by their national interest.

LTG (Ret.) Neil Thurgood:

And the policy has to support it on both sides of the government.

RDML (Ret.) Tom Druggan:

Yeah, that's right.

LTG (Ret.) Neil Thurgood:

The policy has to support both sides. I think we have a bunch of work there.

RDML (Ret.) Tom Druggan:

Frankly, I think we have enough work to do with our own systems. I think the plate is full right now. That's probably okay.

Mr. Riki Ellison:

But I'm just looking at what's going on in the world and the capacity issues right now, like you guys said, the best is to be able to connect everybody to play together so you can have much more capacity and very easily than having to go out and produce a bunch more stuff.

LTG (Ret.) Neil Thurgood:

Here's the other piece of this that I think we got to make sure we bring into the conversation. That is in long-range fires or long-range defensive, or our adversary's long-range fires, it's mostly shot from a protected sanctuary position inside a nation state. How do we influence that fight? In other words, the defense of a long-range fire coming our direction is probably not going to happen at the launchpad. It's probably going to happen somewhere after the launchpad. Now, we'd like to change that.

You asked about directed energy and those systems. We have on the battle space today, lower powered high energy laser systems. We've got to ramp that up. The Army is, in my opinion, leading that charge with their lower kilowatts that are in the fight today. Then the ones we just fielded actually this month at Fort Sill. So high energy lasers are no longer a thing five years out, from my opinion. Do we have it exactly perfect? Absolutely not. We do not. But we have at a point where it's safe enough for a soldier who can use it and we can develop it better.

RDML (Ret.) Tom Druggan:

I think an important aspect here both for naval and ground warfare is even the low power lasers and some of the other non-kinetic techniques, to take on the drums. The drums are coming. We know that, right? We're seeing it now. There's no reason any thinking adversary wouldn't expand their ability for drone warfare. It's going to be a major challenge and it's going to be a present threat certainly in ground

warfare. For naval warfare, you have to remember, we're 10s, 20s, hundreds of miles off the coast. So drone warfare takes on a little bit of a different flavor because they have to be longer ranged with endurance or there has to be a host platform nearby. That gives naval warfare a few different options. The low power lasers and low power non-kinetic energy weapons or non-kinetic weapons can really help mitigate the drone threat.

Mr. Riki Ellison:

Okay. Let's get to our next speaker because time's running fast. Unless you want something real quick, Neil.

LTG (Ret.) Neil Thurgood:

I was just going to say, again, directed energy, I said this all the time, it's not the placebo of life, it's one of many tools in the quiver. It's not that tool. I don't believe there is "the" tool. I think you have to have multiple ways to defend them, multiple ways to attack.

Mr. Riki Ellison:

Okay. Talking about policy, we've got Mark here who spent a lot of time under Senator McCain at the SASC committee doing policy. Mark's really well-rounded. The deputy commander of EUCOM ops and he was the director of INDPACOM ops or PACOM ops. He's an advisor to us and he's a great, great mind behind this. Ladies and gentlemen, Mark Montgomery.

RADM (Ret.) Mark Montgomery:

Thanks, Riki. Good to be here. Two smart guys ahead of me. I'll just pick up on three points. One is we absolutely have to press with offensive strike from all three areas, air, naval, and ground. I want to be clear, the air one's the only one that's safe. If you're a ground shooter, an Army or Marine Corps ground shooter inside the first island chain doing long-range strike into China or in Europe doing strike into Russia or you are a ship out at sea, you're going to be targeted. Particularly in the Asia Pacific one. I think China's got the ability to target in the weapons. We'll talk a little bit about the missile defense that that's going to require in a second.

The reason it's important is the number one driver of casualties in a major Asia-Pacific dust up, whether it's over Taiwan or the East China Sea, is your ability to strike at range. The number of long-range strike weapons is in a seesaw. And the other side is the number of US or allied casualties. If we have a lot of long-range strike weapons, we're going to have a low number of casualties. Most of the war games I've seen or have done unclassified, talking about 5,000 or 7,000 casualties. But if you have to close the adversary because you ran out of long-range strike, whether it was air, ground or naval, your casualty rate goes up to 20,000 to 25,000.

That starts to become the gulp that doesn't quite get through the throat of the National Security Council and the president when they're making decisions. So we have to drive down the casualty rate. The way you drive down the casualty rate is you increase your long-range strike. Now, that leads to the question we're talking about today. How do you make that long-range strike survivable? Tom at the very beginning mentioned cruise missile defense, ballistic missile defense, hypersonic defense. I just got

three quick thoughts. The first is in the ballistic and some of the crews, it's a capacity issue. We have capabilities, it's just raw numbers.

China, unfortunately, can build their attack weapon currently at an ROI, return on investment cost that drives up our spending on those ballistic missile defense, which is why it's so great to hear the discussion of laser and other kind of low unit cost rounds. From my perspective, that's important. The next is the idea, first, you have the capacity. The second is there is a capability problem in cruise missile defense. I've hammered this home. Neil and Tom are probably more genteel and nice than I am. But the Army has got a significant problem with low cost cruise missile defense.

I mean, when I heard that we're going to pass Patriots to Ukraine, I fell in my seat. I'm like, "\$4.2 million a round? We're going to burn through that \$18 or \$20 billion really darn quick if we do that." But in addition, even for the United States, it's not a cost effective round against low altitude conventional sub mach, particularly, cruise missiles. We need a system there. Whether it's NASAMS, which we've been recommending for years, and apparently is good enough for pretty much all our allies and the National Guard. But not for the rest of us, the joint force. That's an answer. If it's IFPC and somehow it stops from being two years away, that'd be fantastic.

That leads to the third problem. The third problem is hypersonics. And here, we do have a problem. We look at our adversary and we go, "They're China and Russia, they're doing pretty good, but we're catching up in the offense we might not even be ahead." That's fantastic. The problem though when you're dealing with a near peer adversary who's an authoritarian regime that has first mover status is it's not your offense that has to be as good as his offense. It's your defense that has to be as good as his offense so that he doesn't have the ability to strike you at will at the start of a crisis and take you out of the game.

That's where I'm worried. I'm worried because if you look at the amount of money being spent on the offense, I'm guessing, it's hard to see with block programs and everything, but I'm guessing 4 billion, 4.5 billion, 5 billion a year on hypersonic offense. I think I'm generous if I say that hypersonic defense is 450 million a year. That 10 to one differential is going to kick our butt in the future. We have got to get this moved up. Also, we have glide phase interceptor BMD and we have I think glide breaker at DARPA. We got a couple programs going, that's fantastic.

But if one of them were to be moved on, canceled or moved on from, even that 10% investment versus the offense would be washed off the table. I'm really worried that we're not making these investments. We really have to focus the Missile Defense Agency on answering this technological challenge about hitting a hypersonic weapon with a weapon, tracking it, getting a fire control solution and hitting it. To me, summing up three issues, one capacity overall, two, some capability in the ground-based cruise missile defense, eminently solvable. Lithuania has figured it out. I think the United States could figure it out. Then three, the capability issue on hypersonic defense. Look, I think we still have five or six years before this really hits us in the teeth, but we better be chugging along at that hypersonic defense so that we don't create a condition where one side can do escalation management and the other can't. Riki, back over to you.

Mr. Riki Ellison:

Okay. I'm going to pass it over to you. Tom, you want to address something?

RDML (Ret.) Tom Druggan:

No, just in your calculations, Mark, one of the things, would you add to that programs like active EEA? Obviously, the Navy has SEWIP Block-3, also known as SLQ-32(V)7, that's going out on ships, which will have denying of the signal. Which is a unique Navy where every enemy missile system that's targeting a ship has to have endgame guidance in order to hit that ship. Consequently, that's something that can be exploited either through the operational deception, the counter targeting decoys and active EEA. Do those kinds of programs or thoughts help or they're already in your logic train here in submission?

RADM (Ret.) Mark Montgomery:

Here's what I'd say, is that they're not in the 450 million category. You're right if you contribute the... And there's a percentage, you have to give some kind of percentage that's about the hypersonic. But we'll just say all of it for a minute. The problem is that leaves you in the same problem with cruise missile defense, which is... I love the Navy. I think the Navy's critical to winning the fight. But the Navy's not the only element to win this fight. We have to keep our ground forces safe. The same mathematics doesn't apply because ground forces move a little. And I think they tend to distribute, they like to.

I mean, we've seen the defensive Guam get kerfuffle by that. The problem with that is those jammers decay in their coverage as range expands on what we would call traditionally missile defense a defended area is of a fixed site. So I think we really do need to figure out a kinetic solution as well. It may eventually not be a missile, it may be some other form of energy or something. But I think those only count a little bit. I would say the same thing, when I think about defending against weaving cruise missile, when you and I command our destroyers, then we say to ourselves, "It's okay if my standard missile system's down. I got chaff." Neither one of us would've accepted that answer from our fire control officer. I think probably for the purpose of this question, I'd say useful but not decisive.

LTG (Ret.) Neil Thurgood:

I think your observation on the Army is accurate. For 20 years in the global warfare, we bought some of that bill with bringing our air defense forces down, including our material solutions to support the air defense force. I think Undersecretary McCarthy, General Conville, that's been a realization. I think they see that point. And I can tell you that the Army's in the process of restrengthening... I don't want to say rebuilding, but restrengthening, thickening both the material solutions and the actual manpower to do that structure. One of the realizations in the combination of the realization is that...

And somebody's talked about counter UAS, it applies with that same construct. You can't build enough air defenders to counter all the counter UASs, right? Everybody's got to have that particular mission set. Particularly for groups ones, twos, and threes. But in the air defense world, we got kill cruise missiles. Again, you got to kill them with NASAMS, you got to be able to kill them with other weapon systems. You got to be able to kill them with a directed energy, both high energy laces and high power microwaves. And the 300 kilowatt system is designed to help with that mission set. But I think that your point is valid in that we don't have enough now and I think the Army is rebuilding that structure now.

RADM (Ret.) Mark Montgomery:

One thing I'd said, I agree. Historically, I'm not IFPC or IBCS. I think I alter what I say now and say I think IFPC has value if it was standalone. I mean, do I believe in AIM-9X's, sentinel radar, generally? I believe those two things work just fine. And I believe in IBCS alone because I think IBCS is like a fancy version of CEC or, as my Air Force general friends like to call it, CEC. That's the CEC system. For 25 years, you've demeaned and kicked to the curb and now realize, "Hey, that was probably the answer 25 years ago." But it's putting them together that makes me nervous. If IFPC's delivery gets tied to an IBCS fire control solution...

My son's a midshipman now, he'll be a lieutenant commander by the time IFPC is out in numbers. So what I'd really love to do is see the Army and say, "Look, we're going to get ourselves... It doesn't have to be standalone, it can be Link..." We know how to do Link 16 with the best of them. It can be a AIM-9X based, sentinel based, Link 16 system, that's going to whack a lot of low altitude cruise missiles just fine. Make it so that when you have a whammy dime, you can break out the SM-6 from a shore-based VLS or you can use a Patriot if you've got a Patriot nearby. That's what I think we got to get to. But I'm afraid the Army's going to try so hard to have the integrated of integrated solutions that we're going to wait a long time on IFPC, maybe 2030 or 2032.

LTG (Ret.) Neil Thurgood:

I think the MRC program, the mid-range capability where we have now have land-based tomahawks and SM-6 as well help that piece as we distill that first battery this month, actually. You bring up a good point, Mark. And I was going to mention earlier, I'll just reiterate it now, one of the differences between an air surface or a Navy surface is we sometimes, while we focus on China and Russia, we forget about our fourth priority. Somebody say the fifth priority, our national defense strategy, which is the violent extreme organizations are still out there. We still are deployed in independent battle positions around the world. Some of our battle positions will never be integrated.

I think to your point, we've got to be able to not only shoot alone, but we've got to be able to shoot integrated. I think as we go through, for the Army THAADs fancy too, which is offensive-defensive fires, the plan is to bring those into IBCS, not slow down the IBCS, if that makes sense. I don't know if that's the right word or not to use, but hopefully that makes sense.

RADM (Ret.) Mark Montgomery:

I'll add one other thing, Riki. I just finished pouring through the NDAA and, it is a tremendous bill. I mean, I don't want to get into the whole Taiwan argument here, but I'll just tell you, it's the most significant legislation about Taiwan since the Taiwan Relations Act of 1979. It will fundamentally change our ability to fight and win in the Pacific. The appropriations is in six days. So I'm not sure it's going to kick the crap out of this appropriations, but a year from now, it'll be good. And two years from now, it'll be great. Three years from now, it'll be the absolute game changer. All right.

But what else is in there? Thank you to Vladimir Putin, his multiyear purchasing authorities. And after Javelin and sting, everyone's looking at getting all excited. Then there's the LRASMs and the Naval strike missiles for Chinese Naval campaign. You're all excited. Then there's the air defense one. There is permission to do long reign, to do multi-year contracting for up to 15,000 air defense missiles between Patriot, AIM 9-X, AMRAM. I mean, it makes you giddy. And there's real opportunity in my mind, and

there is SM-6 in there as well for actual production. And there's defense industrial based investments in the SM-6 factory complex.

The US government's going to put skin in the game to help Raytheon get to the next level, put their own skin in the game and increase production levels. I know for the LRASM, the amount of money should take it from 80 to 250-ish. So it's a tripling. I'm not sure what happened with SM-6. But we're changing the maximum numerator that you can have in your production. These are big deals for us. And I just want to say that the Congress delivered on this and they delivered air defense. I think you may have mentioned already, but they also directed the Department of Defense to procure up to three vertical launch systems for the defense of Guam. Which just made me giddy because you and I pushed that hard over the last three years. And Tom Thurgood, because he was active duty, certainly didn't tell us that it was a good idea.

RDML (Ret.) Tom Druggan:

Well, if we just want something you can buy today right now, then it's an excellent solution. Probably the right solution is having the VLS there to provide that ready defensive response and some other mobile assets to add resiliency and also to induce some level of uncertainty in the enemy's calculus.

Mr. Riki Ellison:

Neil, let's get right to the point. What is the Army's solution right now? You're seeing we're going to get all these interceptors. What are the launchers? What are the systems? What are we doing? Are we going to make NASAMS program record? Are we going to make sea-round program record, is IFPC going to be pushed up? What can you do now to increase your capacity in the Army Cruise Missile Defense System specifically?

LTG (Ret.) Neil Thurgood:

I think it's two parts. For the IFPC program, there's two parts to that. IFPC kinetic high energy laser, those have the priority for the Army. They're going to go forward and you'll see that in the budget. And if you just went through the NDAA, you saw that. That'll come through. We'll see what Congress does at the end of the day which will drive that. You'll see the continued allied and partner nation fielding of Patriots along with our own Patriots. I agree with, I think, everybody in the world that we don't have enough Patriots. And so you've got to get the capacity of our industrial base to build those as we go forward.

Then I'll just add the MRC program, the mid-range capability where you have SM-6s. So now you have a weapon system on the rails for the Army, first one ever, that is both offensive, defensive on the rails. Tom's an expert at SM-6 and Tomahawks, and all those kind of things. So now you have the ability to reach out further. The reason that I had SM-6 in that program is it goes at hypersonic speeds. So the next block upgrades for those weapons systems are critical for us. But that's where the Army's headed. The Army is going to have to learn how to do what we were really good at in the Cold War and we're trying to relearn that capability for air defense at our battlespace ranges.

Mr. Riki Ellison:

Will you expand the C2 THAAD systems with Patriot launchers to just multiply that without using the Patriot radar? I mean, this is the kind of stuff that I think you're doing a little bit in Korea, but you're not doing anywhere else because you're waiting on IBCS and everything else. And you said that, right? You're not going to wait anymore, you're going to go forward.

LTG (Ret.) Neil Thurgood:

You got to get the systems out there that you can right now. I think that's Mark's point. We don't have enough. We've got to get out there. I think to capitalize on Tom's point is we have lots of good examples where those systems are talking in particular situations. What we have to push to, I think as a nation and as services, is global application of what we could do in small numbers now.

Mr. Riki Ellison:

Mark, are there any things that we should answer? Any questions that come up? Or do you want to...

RADM (Ret.) Mark Montgomery:

First, we hammered the questions pretty well. It's funny in the last five minutes that the questions that came in were about strategic deterrents and the hypersonics.

RDML (Ret.) Tom Druggan:

Can I comment on that real quick? Just when we talk about hypersonics, it is so important that whoever's communicating establishes what you're talking about. Are you talking about conventionally armed hypersonic threats in a regional context? Are you talking about conventionally armed hypersonic threats against the homeland? Or are you talking about nuclear armed hypersonic threats anywhere? Those are three different discussions, believe it or not, in terms of US policy.

Mr. Riki Ellison:

And is US policy defending two of those three?

RDML (Ret.) Tom Druggan:

No, no, no. It's just our policy response is different in each one of those cases.

RADM (Ret.) Mark Montgomery:

It's going to make it hard. Because I got to tell you, this is... I don't want to get too much into nuclear politics here, but one of the problems I always had with the low yield trident, the idea that we dial it back to a Hiroshima from whatever it was and it launches. The Russians don't have the ability to say, "That must be a low yield trident coming at us. We're not going to overreact to this." They're going to see it like, "Hey, an SLBM was just launched from a submarine where we had no idea where it was. We better take some action. You know you might trip a few wires there."

We're going to have the same issue going on with hypersonics now. On the ones that, particularly ones against the homeland. Ones against the homeland where you say... Tom says one that's conventional weapon and one that's a nuclear weapon. Let me just tell you, the two of them can look just alike. If you want proof of it, ask the Ukrainians. They've been picking up warhead casings that were clearly previously held nuclear warheads. And the Russians have removed the nuclear warheads to use them as conventional cruise missiles or short range ballistic missiles.

Back to that hypersonic case, one gets launched at you, it's traveling at Mach 8, it's going the 4,000 miles across Alaska. Is it conventional? Is it nuclear? If it's nuclear, you probably have a complete... You're tripping a whole different set of doctrine internally. And I think, we, and the Russians slash Soviets could talk our way through that. We had arms control discussions. We think they were painful but productive, and it's a good way to look at it. With the Chinese, we don't have any of this. The Chinese have for years co-mingled their nuclear and conventional C2, which scares the hell out of us.

We and the Soviet/Russians never did that way. If you're attacking our conventional C2, it's normal game. But you start attacking our nuclear C2, you could trip a fallout attack. But the Chinese relish this opportunity to not be standard and to put pressures on us. I don't know where that's heading exactly, but I think Tom said on a really big point, which is it's an interesting world we're heading to. I'll just say that for that regional hypersonic, conventional, most likely, we better get our act together on defending against it quickly.

Mr. Riki Ellison:

Tell me, are you saying that there's three different systems we have to create? Or we allowed to just use one system-

RDML (Ret.) Tom Druggan:

No. This is not a system discussion. This is a policy discussion. So if there's a conventional hypersonic threat, let's say there's a-

Mr. Riki Ellison:

But the system can defeat all three of them. Correct? If you-

RDML (Ret.) Tom Druggan:

It's the same weapon. That's the point. That's Mark's point. It's actually the same weapon. The one difference is one's nuclear warhead and the others have conventional. But you don't know when it's launched. However, you can say the likelihood is higher in a regional fight where the adversary's trying to stay under a nuclear threshold. That that would be conventionally armed and you need to be prepared to defend against a conventionally armed hypersonic threat, right? The homeland is rife with danger because here comes a hypersonic threat or a raid of them. Are they conventionally armed? Are they nuclear?

Well, if there's a dozen and you look at the top dozen cities in the United States, that's our economy, that's our logistics system, that's our population centers versus a dozen conventionally armed. So that

creates a major dilemma for a national decision maker, the national command authorities on the response. So the assumption could very well be, "Listen, if anything comes, we're going to assume it's nuclear." So that gets us back to our strategic deterrent posture. But that's where we launch nuclear weapons that you can response.

Mr. Riki Ellison:

On Guam, that seems to be right there in that gray area. Is that a gray area or is that clearly US...

RDML (Ret.) Tom Druggan:

Nothing is clear. So that's...

Mr. Riki Ellison:

It's a gray area.

RADM (Ret.) Mark Montgomery:

I got to jump in. Listen, for the purposes of this nuclear discussion, this is about the homeland, the continental United States plus Alaska and Hawaii, honestly. This is regional, say, "Look, you could have a nuclear tip regional weapon. We've always felt that..." Who's to say that a DF21 flying at a aircraft carrier is conventional versus nuclear? If you want to make a close miss, be a kill, and you want to take out the four destroyers with the carrier, why not put a nuclear tip in it? I don't think the Chinese are going to naturally do that. But what Tom's introducing is that there's a whole... If we think it's a cluster to talk about the technical problems of shooting it down, it's also a cluster to talk about the policy doctrine of thinking about it.

RDML (Ret.) Tom Druggan:

My point is that the people talking just agree to talk about... What are they talking about? Are we talking about this or are we talking about this or are we talking about this?

LTG (Ret.) Neil Thurgood:

Well, I'll just add to that. This whole conversation is about ambiguity, right? It's about ambiguity. And in defending nations in ambiguity, the most likely outcome is to assume the worst and then back away from it. That's how you protect everything that Tom gets talked about, is creating multiple dilemmas. And our policies, what we do in that ambiguity defines what policy we apply for the response.

RDML (Ret.) Tom Druggan:

So typically, this gets broken down, instead of three, it gets broken down to two. Regional conventional hypersonic threats and homeland nuclear defense. For the regional conventional hypersonic threat, we're relying on deterrence and active defense. For the defense of the homeland versus a nuclear hypersonic threat, we're relying on strategic deterrents,

Mr. Riki Ellison:

Which is no defense, all offense on that right now. Okay. Mark, anything else? Any other questions? Anybody want to... Before we close?

RADM (Ret.) Mark Montgomery:

Believe it or not, between Tom and I, we hit all the questions that came in during the discussion, including some complex ones about SM-6s that Neil happened to hit. Good job by everybody. Riki, I think we're at the position to closeout.

Mr. Riki Ellison:

All right. Listen, everybody just do a short conclusion on the discussion today. Go ahead, Mark. Can you start?

RADM (Ret.) Mark Montgomery:

Great discussion. Good to hear two smart experts, Neil, Tom. Then I'll just add that there's a lot to correct, there's a lot of great stuff being done, but we can't conflate getting some stuff done with getting all the stuff that we need. There's a lot more that needs to be done. I hope that the FY24 Defense budget is a step off in the right direction on some of this and they don't require Congress to fix it. Because if Congress has to fix all of it, they'll probably only get to some of it. Let's look forward to the Defense budget in February.

Mr. Riki Ellison:

Thanks, Mark. Tom?

RDML (Ret.) Tom Druggan:

Thrilled to be here. First time since I retired. Really happy for the invitation. Great to be with Neil and Mark. Really proud to be able to be here as a senior associate of the Center for Strategic and International Studies and part of the Missile Defense Program there. These kinds of discussions and the ones that they host as well are really important to help policy makers as well as Congress decide on the trajectory for our nation. That's pretty important work.

Mr. Riki Ellison:

Thank you. Thanks. Okay, Neil?

LTG (Ret.) Neil Thurgood:

Thanks, Riki. Again, thanks for leading this and founding this and getting us in the conversation. To Tom and Mark, thanks for your insights and for your service to our nation. Both critical, in my opinion. At the end of the day, we're talking about one piece of a huge defense infrastructure that has to get resolved between building ships and building tanks and building aircraft and building missiles, our leadership, our

national command authority, our military leaders have some wicked hard decisions to get made. I think the more we can inform that conversation with policy and the conversations with material, conversations with tactic procedure conversations, I think they're better off... Our leaders have a chance of making great decisions. God bless them for what they're doing for our nation. It's wicked hard work.

The last thing I'll say is at the end of the day, whatever we do has to work together. We are beyond the parochials of the past. And if one thing that we learned working with Tom and Vice Admiral Wolfe and Vice Admiral Hill now and the MDA director and myself is we can do it. We can behave differently, we can act like we're actually a nation fighting, not services fighting. And if we do that, then we have a better chance at both capacity and capability as we move forward. Again, Riki, thanks for the time today. Great to be here.

Mr. Riki Ellison:

Thank you, Neil. Thanks, Tom. Thanks to Mark. We came up with some solutions that are real. You guys brought some good thought on allied participation, service participation on the C2, all the way down to the firing, to the systems that we have today and the future systems. And we've got Congress behind us. I mean, what Mark said with the NDAA, the money going into this, this is no longer an issue that nobody addresses that has been practically the last 20 years. We are now looking, our Congress and our funding is looking at capacity to build to take on the near peer, to take on the regional fight that we have to do.

And it's awesome to see, it's awesome to see addressing the Army stuff. I'm glad you addressed that clearly on how they can help and where they're going. Tom, you got the best system. It was great to reinforce the Navy's greatness on this mission set. Anyway, to me, it's about team play. I'm going to just go real quick to a football analogy. But if you look at the San Francisco 49ers, they've got the last pick in the draft being their quarterback, and they've been able to play at the top level of the game beating everybody with this guy because the team is so good around him.

And we're going to have weak spots. We got weak spots. But our team and the way they play together, and I think we've all mentioned that, jointly and allied way is the way to beat these guys. There's way to come up with a solution that works today while we can hold on in the future. I thought this discussion was great. And being able to open this thing up right on the fact of the congressional support for what we're doing, it's excellent to have you guys with us, it's excellent to go on beyond just North Korea and Iran and the old school ways. You guys are breaking new barriers. You're leaders now and your opinion and where you're going in your careers is huge to help this mission set expand and grow where it needs to go. So thank you very much. It was a great discussion. That was really, really fun to have you both here. Mark, you were awesome as always. So thank you.

RDML (Ret.) Tom Druggan:

Thanks, guys.