

+071018 Missile Defense Advocacy Alliance Capitol Hill Forum with Deputy Undersecretary of Defense for Policy David Trachtenberg; Missile Defense Agency Program Executive for Command Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Rich Ritter; Rickey Smith, Deputy Chief of Staff G-9, U.S. Army Training and Doctrine Command; and Riki Ellison, Chairman and founder of MDAA, on “Missile Defense Command and Control (C2) in a Cross Domain Environment”

MR. RIKI ELLISON: Good morning, everybody. I'm Riki Ellison, I'm the founder and CEO of the Missile Defense Advocacy Alliance. We were founded in 2003 right after Dave Trachtenberg removed the ABM Treaty, released the ABM Treaty, and we were formed to help educate the American public. Our mission, and we believe fiercely, that the deployment of missile defense makes our world a safer place and a much more stable place. We're seeing that today.

Our president is engaged in talks. We haven't seen nuclear testing from North Korea. A huge achievement is last year our GBI shooting down a target representing a North Korea threat gave, I believe, great confidence to our nation to be able to engage in those types of talks. So we continue to believe and press forward in partnership globally with our allies to get as much of that capability out and about.

We're here today to open up the discussion on something that's not really visible from the public perspective, but the C2 command and control of the cross domain missile defense capability. We are transitioning from a single ballistic threat that we have become very good at defeating and negating, to a near peer competition in other domains, especially space. And we are developing systems, both sensors and interceptors, in space to have sensors and interceptors that are going to be in various domains and be able to coordinate what that best sensor is and what that best shooter is, and be able to give it to your solution set and fire control without much latency, is the future, is where we have to go to win and to deter capabilities that are facing down the threat.

We are very honored to have an acquisition expert here. We are honored to have a war fighter here, and our policy expert here, and you can see a combined viewpoint of how they are looking at this problem to resolve and create solutions to make our country more capable than it is in bringing those different domains together on the command and control aspect of it. So we're going to have a five to 10 minute discussion from each of our presenters and then we will open up the floor to questions. I would ask you to refrain from questions on the MDR. This is a cross domain discussion on C2, let's keep it that way.

Our first speaker today is Rich Ritter, who spoke with us with Sam Greaves back in 2015 when he was the head of SMDC. Rich is coming from MDA where they have the cross domain C2 for a linear system that is for a ballistic missile defense system that they have created, developed and put forward and is operational. I think it is one of the

only in the world that crosses with all those domains and is effective today. His title, he's been involved in missile defense since he was with the Strategic Defense Initiative in September of 1990, and currently serves as the program executive for command, control, communications, computer, intelligence, surveillance and reconnaissance for the Missile Defense Agency.

Rich, it's all yours.

MR. RICH RITTER: Thank you. Many in the audience I've worked with and worked for or whatever in the last year, so you kind of know where I'm headed on some of these things. Let me spend a few minutes first defining what cross domain -- the way I perceive what it really means, and then go into what's driving missile defense from an acquisition standpoint. I'll depend on the operators to carry over to the next part, and then where we are on C2BMC.

In traditional war fighting we think of air, land and sea, but those worlds are starting to evolve and change, and you've probably seen some of the discussions by our leadership of there's a new domain in cyber and space. The real trick of the whole deal is we don't fight land wars, we don't fight space wars, we fight war. All these domains have to be integrated and work together to accomplish the overall goals.

One of the features of the new domains, cyber and space, is it gives it global context. If I'm going to make a reaction in space, that affects lots of CoComs, so you need coordination across the globe. We also need an ability to understand what the effects are on the ground, so you need a mechanism where folks can coordinate.

This actually drives the very nature of the cross domain C2 and is something we've had to work with for some time in the Missile Defense Agency. So what drives missile defense? The cross domain is not a unique feature. Missile defense has been dealing with it for a long time. By doctrine, I can take it out in the air, but I can also take it out on the ground, so I have to have cross information across the globe.

It's a team sport, it crosses domains, crosses services and crosses the CoComs. A ballistic missile from one AOR that is a threat may be actually attacking another AOR. We need a mechanism where the combatant commanders who have the legal authorities to execute the war have a way to coordinate.

You'll be hearing the expression left-of-launch and right-of-launch. You need a way to be able to exchange information, know what's going on and coordinate those activities. It's the basic function of command.

There's scenarios -- and we have a lot of these that we practice -- there's scenarios where we have a sea-based upper tier, a Navy upper layer for a Patriot unit on the ground. You cross services, but you're all fighting one battle for the purpose of the combatant commander. Typically, it may be a soldier located in an Air Force AOC that's actually coordinating the fights. So we've had to work this for a long time.

In the case of longer range threats -- and most of you in the audience wouldn't be surprised -- that is the ultimate cross domain across the board. A space asset will actually do the initial detection and cueing. That is typically run by the Air Force. It will go to the sensors that may be land, sea or air, and that will give you final target conclusions and be passed to a shooter to go engage. It may be, right now, an Army or Navy shooter.

So we've had to deal with the cross domain, cross service thing for some time. C2BMC, as Riki indicated, is really our mechanism for our integration across the domains. Right now it's 24/7 operations across 17 time zones. We have functionality in five of the CoComs, including the Joint Chiefs area. From there we can watch what's going on across the world and provide situational awareness and the tools that the combatant commanders need to coordinate, plan and engage in the fight.

What we've been adding lately is also in space, we've connected into the space domain. We can machine-to-machine tasks overhead assets waiting for task instructions or for data dissemination to take greater advantage of that sensor capability too. As I mentioned, missile defense is a team sport and includes not just U.S. assets. Often, in many of the theaters, it also includes the allies, so we've had to work out those relationships and what is the safest secure way to exchange information between our allies to coordinate the fight?

In summary, war fighting is involvement, and we're working with the operational community. In some cases, as an acquisition guy, you've got to think ahead a little bit. Given the capability, realize when a war starts you may not be given the deck of cards you thought you were going to get. You need the flexibility to be agile and to reconfigure to go meet a particular need. We have done this now for at least 20 years. We've got a good capability that's out there and we're going to need continued support for that capability as war fighting evolves over time.

That's all I have right now, and will await your questions.

MR. ELLISON: Our next speaker is Rickey Smith. He is leading the charge for General Townsend (ph) on the cross domain movements, 1.5 is where we're at today. We just had a big conference a couple of months ago with Lieutenant General Walsh and Townsend. He's going to give you an Army perspective, a war fighter perspective, on what's needed for the cross domain.

Mr. Smith was appointed the Army senior professional for capability development in June 2009. He represents Training and Doctrine Command at joint interagency, multinational and service staff forums in the National Capitol Region. He engages with the Army staff, Army secretary, Office of the Secretary of Defense, members of Congress and their staffs, the Joint Staff and academic organizations to identify, develop and synchronize capabilities for current and future Army forces.

MR. RICKEY SMITH: By the way, I'm not leading it. I don't get to ring the

bell. But I will say I think I can give you a perspective of where the Army is as part of the joint force is in our concept development.

Of course, you need to take a gander back at October of this past year when we introduced our updated operations doctrine. In the doctrine we said we can do it today, so in Field Manual 3.0 it is large scale high intensity major combat. So bring that back, make sure you can do it, it is a leader development challenge as much as if not even more so an equipment challenge.

So as we look to the operational environment of the future, we're seeing some key areas, the joint forces contest it all, the war fighting domains, as mentioned, as well as across the electromagnetic spectrum and then the information environment. So as hard as it is to do war, we just get more complicated. We also see that that complex environment is going to be increasingly lethal. Our adversaries are working on ways to inflict damage on our systems and on our soldiers, marines, airmen and sailors.

The other part is that this challenges our ability to deter, because if they don't think you will use that force, or if you don't have adequate force at the point of need, then it gives the possibility of miscalculation or aggression. So we're looking at that very closely. On the environmental side we see dense urban environments. If you think missile defense is hard, or countering air is hard, just put it inside of a mega city and it becomes exceptionally difficult both in terms of communications and the ability to acquire and address targets.

So as we look at that, the Army vision recently released by Secretary Esper emphasizes that deployed fighting wins decisively, but the words joint, multi-domain, high intensity conflict is about modern war fighting doctrine, and we're referring to that. It's emerging in a concept work called multi-domain operations. So while we have something on multi-domain battle, which sounds more cross domain, one-to-one if you will, in our current doctrine we are bringing forward our version of a concept for multi-domain operations. So as hard as it sounds with all the domains, imagine being supported and supporting simultaneously all of them. That's really where we have to get to to achieve the synergy we seek.

Now as you look at potential adversaries -- I'll take two from the National Defense Strategy -- China and Russia, think of Russia as an artillery army with tanks. They have retained this ability for long range. It's about physical standoff, and they also do many activities in the information environment to keep us at bay. On the Chinese side we see them working on systems warfare, and it directly confronts and goes after not all of your entities, but of your ability to mission command and control. They want to disaggregate us. So that is something we have to then bring more robust capabilities, and that's why this effort in cross domain command and control is so important.

These anti-access and keeping us at bay to deny us area activities through standoff have to be confronted. At the same time threats are evolving and improving. Think about autonomous systems, air and ground. Swarm UAVs come to mind. We see

directed energy and hypersonic weapons coming, and quantum computing and processing of data.

That may be part of our solution to command and control in the future, but it is definitely going to be something we face on the other side. So the central idea for multi-domain operations from the Army's work, that we are working with the Air Force, the Navy and Marines, is the ability as part of the joint force to compete daily, to penetrate and disaggregate, even when they're working on anti-access and area denial systems, defeat the enemy, and then consolidate gains. There's several key questions, but part of that is how do you do that in terms of penetrating and going in to disaggregate?

The sea strike, most people kind of go okay, you find it and you hit it. But we also add to that stimulate sea strike, because they won't turn on their systems unless they feel like there's enough threat. When we can acquire, the U.S. generally has the ability to provide countermeasures. So how we go about creating simultaneous pressure at mid- and long-range matters for the joint force at all times. And we want there to be uncertainty on the opposing side, mainly so that we don't have to use it. But when we do, we want to make sure we provide multiple dilemmas.

So as we think about cross-domain maneuver, maneuver being the movement to positions of relative advantage, going back to deception, going back to the ability to fire, the ability to provide the countermeasure, if you will, of the launch, acquire it some other way, you can only do that if you can share information at all echelons. So as hard as it is when you have 30 entities, think in terms of hundreds of thousands. That's how many soldiers and marines will be on the ground spread out, especially in things like dense urban terrain.

So as we go forward we're looking for greater speed, accuracy and synchronization. The six priority areas the Army is working on: modernization, long-range fire, future vertical life, next generation combat vehicle, networked lethality and air missile defense. But when you look inside of every one of those you're going to find the network piece because if you cannot do mission command you cannot handle command and control. So as we go forward, things like artificial intelligence is just as important as ultra-secure communications or directed energy, those kinds of things that kind of come to mind when you think about countering air and missile defense systems.

We've taken some steps to bring back what we allowed to atrophy. It was a good risk choice at the time, but we took short range air defense down to a very, very small capacity. We limited it because we were fighting the war we were in. So after a decade and a half and more, we need to revitalize that.

You'll see that in the recent delivering short range air defense. The 'I' for that is initial, because we do see it coming forward and being able to add additional assets to that, so you don't have a one trick pony vehicle. You need to be able to do electronic warfare. You need to be able to shoot down UAVs. You need to be able to counter missiles, if you can, from those systems.

Then the next step is to continue the multi-layered air defense because what we have above we also need to bring from the bottom so we can create that multiple layer air defense. The key to that will be a mission command network that's capable of sharing that information. In the area of modernization priorities in science and technology, I've talked about directed energy. Also think about long range high probability of kill capability. We're increasing range on cannon tubes, and why that allows us to do, especially in air defense, which is key and allows the world's greatest air force to do the job we need to do.

And then as we go forward, we have to work on the sensor array on platforms, because they have to be able to deal with electronic warfare. They're going to try and unhinge us and desegregate us. Unfortunately sometimes the best people to jam a U.S. Army element is the U.S. Army. So we have to work on that and that deconfliction, and that is as you can imagine in the electromagnetic spectrum a very significant challenge.

I'll be glad to field any of your questions. We are moving forward on force structure. At the end of the day the equipment is actually not the most expensive. So we are moving forward with short-range air defense battalions and bringing them to life as we go. That manning has to be done, but it also means you've got to get the soldiers, you've got to educate them and you've got to train them and bring them forward, as well as buying the kit.

That's what I've got.

MR. ELLISON: Our next speaker, I'm just pumped up because both of us went to the same school together at the same time in 1978 under Bill Van Cleave at USC, and doctored in that (movement ?) that Bill was, which you got the chance, obviously, to help break the ABM Treaty and look forward to where we're going today. So it's a treat to have the Deputy Undersecretary of Defense for Policy for the United States of America, Mr. David Trachtenberg.

SEC. DAVID TRACHTENBERG: Riki, thank you very much. I really appreciate the invitation to be here with my colleagues. Thanks to MDAA for allowing me to participate in this discussion.

I was thinking on the way over of what I should say in the limited period of time I have, and I was reminded of the old story of the guest speaker who was given 10 minutes to make remarks. He was the absolute world's expert on the topic and he got very indignant when his host told him he had 10 minutes. He said, how do you expect me to tell this audience everything I know about this subject in 10 minutes? His host looked at him and said, well sir, I advise you to speak slowly.

(Laughter).

So I will try to speak slowly. I am not a technical expert nor am I an acquisition

expert, but I did stay at a Holiday Inn Express. I would like to just basically from a policy perspective focus my comments in a couple of areas.

First, I agree with what has already been said by Rickey and by Rich. I don't think from a policy perspective there's any disagreement there on what it is we are talking about. I am especially pleased that we're having this conversation on C2 in a cross domain environment because I think for a while the entire C2 effort has been seen perhaps in the public domain sort of like the family cousin twice removed.

What I mean by that is most discussions of missile defense seem to revolve around the hardware. We're talking about the shooters. We're talking about sensors. We're talking GBIs or SM-3s or SSBX, all those systems and acronyms that we all know so well.

I think you, Riki, said that C2 is not really visible from a public perspective. It doesn't get talked about much, but I would argue that the command and control, the C2 element, is really the glue that holds these systems together. It's what makes them effective.

So C2BMC is an essential element of the ballistic missile defense system. Frankly, without the ability to command and control these systems, without the ability to integrate the C2 capabilities, one could argue that our missile defense capability is essentially ineffective against a range of threats that are out there. So that's one reason why I think this particular discussion, focusing on the C2 element, is a very timely one.

Not that long ago, I can recall when we were debating whether or not missile defense in general was a good thing or a bad thing, whether it was stabilizing or destabilizing, whether our focus should be on theater missile defense or what was then called national missile defense. Some of you may be young enough to remember those debates as well as I do. Today, the focus has clearly shifted.

We are well beyond that, thanks to MDAA's efforts and the efforts of others, and the Missile Defense Agency, to develop these capabilities and actually go forward and actually deploy a missile defense capability. But today, the issue really is how to make these systems, our systems, operate holistically, how to integrate them effectively to maximize our capability. This is important because the missile threats that we face today as a country are evolving. They are becoming trans-regional.

I think, Riki, you talked about the trans-regional nature of these threats. It is true. A missile can be launched from the CENTCOM AOR and it can go to the EUCOM AOR, the Indo-PACOM AOR. We are talking about trans-regional threats as ballistic missile capabilities proliferate. As the ranges of ballistic missiles extend they create a multitude of problems and issues.

And of course we're not only talking here about ballistic missile threats, but a whole host of other types of missiles threats as well, including cruise missile threats

which present their own unique challenges, as well as hypersonic threats as well. So from a policy perspective, I would argue that it's probably time, if not past time, to start thinking of missile defense not in terms of the individual stove-piped programs that the services operate.

Let's not think of missile defense as particular Army programs. Let's not think of PAC-3 or THAAD. Let's not think of missile defense in terms of Navy missile defense, Aegis ships, SM-3 interceptors. Let's just think of missile defense in terms of a unified, integrated, joint capability. As well, let's consider ways to integrate our missile defense capabilities: land, sea, space, all of those domains, across domains is absolutely essential.

I would say in terms of -- I would make three general policy points. The first is I think it's key that we integrate our missile defense capabilities against all types of missile threats. Again, I mentioned ballistic, cruise, hypersonic. That is key.

Why? Because that is the world that we face, and that is increasingly the world that we are going to face. So we're going to have to (confront ?) and actually deploy capabilities to address that multitude of threats.

Secondly, I think the issue is matching terms like offense, defense and (integration ?). I think our ability to defeat missile threats goes beyond individual systems. It goes beyond active defenses. There are passive defenses and there are offensive capabilities that we have. All of these types of capabilities are drawn together. But robust command and control capabilities, wedded together, integrated together, are essential to addressing the overall missile threat and missile challenges that we face.

Third, I think it is an absolutely essential point to note that we in the United States need to continue to work with friends and allies abroad to integrate them into the overall missile defense system. That requires, obviously, a lot of diplomatic effort. It requires a lot of military-to-military consultation.

And it involves the allies also recognizing that we need a tremendous amount of capability and that their systems -- many of our allies are working on their own missile defense types of capabilities -- but they also need to be integrated to the kinds of capabilities that we bring to the table. That also includes the command and control element. Also it certainly includes the C2 piece of that.

Being able to net their capabilities and to integrate architectures and developments so that we have a system that is truly global in nature, global in scope, and can address a variety of threats, not just the ballistic threats that we face, I think is absolutely critical. So I don't want to discount in any way the role that allies can play in addressing these challenges.

I think all of those things are consistent with the comments that both Rich and Rickey have made. I won't belabor the point in terms of the sort of evolution of the threat. It is correct, as Rickey noted, that the 2018 National Defense Strategy sort of

refocused our efforts, clearly, on Russia and China. It sort of emphasized that we now face a security environment that is more complex, and arguably more volatile, today than it has been in recent memory. Those are the kinds of challenges that we need to address.

We are looking within the department at what Russia is doing. We are looking at what China is doing. We're looking at what North Korea has been doing. Yes, there are potential opportunities on the horizon to change the nature of that relationship, which we hope we can be optimistic about, but we're also realistic and clear eyed in terms of what past history has demonstrated. But nevertheless, we need to be clear eyed about the evolution of the threats.

We also look at Iran, also, and we see the development of Iranian capabilities and how those capabilities are being developed not just by Iran but by other adversaries or potential adversaries as well who look to these kinds of systems as ways to coerce either the United States or friends and allies in order to achieve whatever their foreign policy or national security objectives are. So the threat is out there. The threat is clear. We have made some very significant strides not only on the hardware and the software, but in the integration and the command and control types of architectures. But clearly more needs to be done.

The message I would leave you with is that from a policy perspective we are absolutely four square behind the effort to move out in a holistic way to make sure capabilities are as integrated as possible, to break down stove-pipes wherever we can and wherever it makes sense to do that, to bring allies onboard to work with us, including the C2 cross domain environment, and to move forward so that we tackle this problem on the global basis which it presents itself. I think I'll go ahead and stop there and turn it back to you, Riki, and open it up to questions. But I think we're in general agreement here on the importance of this particular aspect of the missile defense issue.

MR. ELLISON: Thanks, David. I'd like to kick off the first question, and then we'll open it up. I'd like to ask Rich, since you've got a C2BMC that's operational, that's cross domain, how do you adjust that to the hypersonic and future possibilities, which is the cruise missile defense over the horizon? Is that an integrated single picture or is that separate pictures? And not just for the U.S. homeland first, but also in the regional fights, how do we coordinate that type of look? It's been said that the single integrated air picture is too difficult to do, so I just wanted to see, as the acquisition guy, what your recommendations are.

MR. RITTER: We're already moving out on the hyper glide vehicle from a defense standpoint. The department has designated us to be the lead agency on the defense side, not the offense side. What I can talk about here is that we've done a lot of work already, working with our space folks. One of the things you really want to see is, this thing is flying low and you want to be able to track it through its whole course of action. So we've been engaging heavily with our space community and figuring out how to get the data and track it.

There's a couple of key things we're working. When a ballistic missile goes up you pretty well know where it's going to come down. You've got an impact point. We've been working with the operators, and when it's a hyper glide it's all over the place. How do you indicate on the screen, make data useful, so he knows he's under attack? It sounds simple, but we've worked a lot with the operators to get their feel of what is representative or what is useful versus what is not useful. So we're all in. We think the infrastructure can be adapted to go do what we said, and we're all in on the hyper glide stuff.

I'd like to add one other thing that I should have added to my other point. As an acquisition guy, we have a tendency to go back and say, this is my domain, I'm not going to pay for this, or whatever. What we've been able to do is, I'm a sensor enterprise type individual. A sensor is a sensor. It doesn't know whether it's doing missile defense, technical intelligence, space situational awareness. It's the application at the end that determines it.

So to the extent possible, we've been exposing the data to the other critical mission areas. That has allowed us a give and take, back and forth, with the community. Some data that we have is very useful to space communities. The space community has data that's very useful for us. So we're opening up those stovepipes across the domain to be able to share the data, and particularly the focus is on the hyper glide, you're absolutely correct.

MR. ELLISON: Where do you see your role? Is that sharing data or is that separate to the services?

MR. RITTER: No, I think there's two parts. One is, from a C2 perspective, C4ISR on that is definitely ours because we've got the structure you can take advantage of. I think the department is still weighing through what are the best items for kill mechanisms for that, and that will fill out over time, unless the secretary has a different point of view. We're still working our way through those kinds of issues. We're in the process of actually going through an AOA looking at the various options. We've gotten approval to go look across the department, and that stuff is still being sorted out. That's about the most I can say here.

MR. ELLISON: Alright, let's open it up for questions to anybody in the audience.

MR. HERB KEMP (ph): Herb Kemp with Alpha Corporation (ph). All of this is good. We talk an awful lot about the need for an integrated air and missile defense. Some would argue that's not necessary, but not sufficient. At what point do we also include counter-defense in that. At what point do we include left-of-launch against ballistic missiles. Is that part of the doctrine? Is that part of the technology that's needed?

MR. TRACHTENBERG: I would say a certain part of the approach that we're

taking is trying to look across the range of activities in order to deal with the range of threats we face. So when we talk about missile defense, some call it missile defeat, there are various approaches that can be taken. It's not just the active defense component, although that is of course important. But there are other capabilities as well.

You're right to call them out. That is something that the department is looking at across the board. So definitely, there are pieces of each element of those, whether it's active defense, passive defense, or whether it involves offensive capabilities, whether it involves cyber. There are various piece parts to this, from a policy perspective we want to address, and we need to address, when we look at the scope and magnitude of the issue that confronts us.

MR. SMITH: We operate in an analogy that people -- because I hate the drawing, it makes it look like a snow dome or a globe. So think of it as Swiss cheese instead, or we can punch our own holes. Because how you go in through either a cyber or physically go in, but people think of that as one singular. If you can knock out the sensor you don't necessarily have to take out the shooter. But you've got to find the right sensor. So we approach it from the aggregate joint force. Because it's not just access, it's access for what? So I would tell everybody every time you see the dome drawing, just punch a few holes in it and that makes it a lot more realistic as a starting point, because nobody has got it that tight.

MS. : What are some of the foreseeable challenges in space and does the Army have a boost phase intercept?

MR. RITTER: She said Army.

(Laughter).

Boost phase, as you know, is a difficult problem time wise. So we're re-energizing and looking at those areas and where the technologies are. It may not be kinetic. It may be laser or other things. So all those options are on the table and they're still going through it.

MR. TRACHTENBERG: From a policy perspective, I would agree with that. We are looking at a variety of options, including directed energy and non-kinetic kill capabilities as well. So I absolutely concur.

This may be one of the areas where our focus has been reduced in the recent past. We want to try to perhaps re-energize a focus and emphasis on it, a look at this in terms of game-changing types of technologies. So that's part and parcel of the overall approach that we're taking in the department.

MR. JUSTIN KUPPERMAN (ph): Justin Kupperman from Inside Defense. Can you give us an idea of what's behind the delay in the Missile Defense Review and when it might come out?

MR. TRACHTENBERG: It's coming out soon.

(Laughter).

MR. ELLISON: I want to introduce you to Captain John Lipps who has been our Missile Defender of the Year twice, once in the Pacific and once in Europe. He's going to shed a little light, I hope, on NIFCA (ph) and how the Navy does cross domain, and that aspect.

CAPT. JOHN LIPPS: Unfortunately, no sir, I'm not. Thank you for the invitation. I am actually here to support an MDA table top that starts tomorrow, and I received the invitation in a timely commander to allow me to be able to roll in from Capua, from Italy to here.

Gentlemen, thank you for your thoughts and your comments. A quick observation, one, I thought it was a great dialogue about the inclusion of the allies. Both from my experience in the Pacific theater and then as well in my current position in the European theater, their contribution is just as vital, just as critical, as the entire joint force, quite frankly, when you look at dispersion of sensors, dispersion of engagement systems, but also C2.

That leads me really to my comment that we talk about C2 I'm a C2BMC agnostic on the cost from a sensor perspective in a conveyance. I think in light of great power competitions one of the things that is not clear to me is when I think of the missile defense system as it was originally envisioned, it has been almost the antithesis of a response to a great power competition. If I look at high end integrated air and missile defense as it matured over my career, it is in fact the highest form of great power competition, especially if we start to include the effects of low Earth orbit in space and what that's going to mean to elevate the fight into that domain.

But the other piece that is just as critical in a great power competition is the execution of that fight from phase zero on up. And so a C2 system that's able to respond, from a planning perspective as well as the execution, I think is absolutely critical. I know that the fielded C2BMC allows us to do that across the force. I'm assuming that as we field the son of C2BMC will provide that same type of capability?

MR. RITTER: You got exactly where we're headed. I don't disagree.

MR. SMITH: John, I would just add that even a reference to phase zero, in this world there's no -- it's always competition and you may go into armed conflict. No one is giving us any time off. It's a constant. So that end-stride change is -- as you know I used the analogy earlier it's a biplane going to a single wing, but we don't get to land. That's the way it's going to be as we work on it.

MR. LIPPS: The fleet commander would say that if we do our job properly in

phase zero, we preclude the evolution of conflict.

MR. RITTER: Yeah, and stay across the globe constantly, that's the challenge. You got my theme too. We concentrate on phase three or whatever, we've got this gigantic fight underway. It's interesting because I had this conversation with folks this morning.

Phase zero is equally important. Phase zero doesn't necessarily have the (raid sizes ?) that you have to worry about. But as we went through the last two years, it's a tremendous drain on supportability, logistics and everything else. The other problem you have is you've got to make damn sure you don't accidentally shoot. So the control aspects of the thing are actually more difficult in phase zero.

I'm glad you're going to be at the war games. That's kind of one of the things I'm pushing. We kind of think, you would expect to continue reaching out, particularly the drain that has been on your guys, so it is something we've got to address more. So I totally agree with everything you're saying.

MR. TRACHTENBERG: Thank you, John, for re-emphasizing the importance of our allies role in this, allies and strategic partners. This really is sort of one fight and it's not just joint U.S. It's joint with the partners as well.

MR. RITTER: I'm not disagreeing. Again, the difficulty is everybody just assumes you can plug in and everything works. We went through FM-17 together and a few of the other ones. The fact of the matter is what you call a shot and what you call a shot are different.

So getting everybody to come up through a standard set of data standards that everybody works off, that's using the same geo-reference on the Earth, that you can pass stuff back and forth, it's not a trivial issue. We've come a long way doing it, but as was mentioned before, hyper glide is a new world we've got to deal with. It's not ballistic any more. How are we going to handle that and how are we going to share it with our partners? I totally agree with you.

MR. : Could you share your thoughts on, in light of the great power competition, the evolution of your line of thinking on what that does to the distributed battle management command and control as you get out of what has been traditionally more centralized nodes? Acknowledging the fact that they will be targeted by adversaries, they are pristine targets across all the domains. What efforts are you taking to push back in NIFKA (ph), operations, and push that across the services from either a policy perspective or acquisition perspective?

MR. RITTER: I think we're very distributed. I don't think it changes -- as a matter of fact, if anything we're dealing with creating more capability into various locations in CONUS and reaching back. So we are hitting that. We're not going to change off our distributed function. The fact of the matter is the CoComs are actually

backing each other up and everything else, so we are an agile process right now. It's exactly where we're going, but I just can't go into the details here.

MS. : Could you give us a little more information on where the bloc zero stands and how the different services are integrated at this point and how fast they can get them?

MR. RITTER : Bloc zero to what?

MS. : This block zero that you're talking about, or phase.

MR. SMITH: That's the campaign model in joint doctrine, phase zero is when you're not in armed conflict. One through three is then the fight itself, the armed conflict.

MR. RITTER: It's not a program.

MR. SMITH: It's not a program.

MS. : I thought you were talking about a program.

MR. RITTER: No.

MR. : You talked a lot about the inter-agency discussions. You've had a lot of success with sharing those sensors. But as these more advanced threats come online, this all gets more challenging. Does that pose new policy questions in terms of how we're going to actually man all those forces?

MR. TRACHTENBERG: I don't think it poses a new policy question. I think from a policy perspective there's a degree of continuity there, the architecture and approach in terms of what we need to do. When you mentioned the inter-agency I think you were talking of allies and partners.

MR. : Allies, partners, Air Force, Army, MDA, everyone really has to work together.

MR. TRACHTENBERG: I couldn't agree more with that. I think there's a substantial level of cooperation today because of the joint understanding, not only within the inter-agency, within the services, the CoComs, and also allies and partners, in terms of the nature of the threat. So I think whether we're talking about NATO, where the summit is about to take place now; or whether we're talking about the Indo-Pacific region or our Asian allies looking at some concerns there, I think from a policy perspective there is this general recognition of the problem and the need to coordinate and to work together in order to be able to resolve the issue in a way that is the most effective. So based on what I've seen, I've been pleased with that level of interaction and coordination.

MR. SMITH: I would just add from our view of the way the threat sees us and

how we operate together, things like anti-satellite weapons, we are emphasizing on the mission command side the ability to work degraded. But then when you add that to a C2, you'd better be redundant, you'd better have the ability to back each other up. And think of the speed at which we're asking that to happen. At the end of the day, you're not going to become impervious, you just have to build in sufficient redundancy and robustness to do it.

And then from the mission command side, you'd better be able to operate without being told what to do all the time. It sounds real simple, but it's really not. So as we work our way through those, as I like to say, no threat ever goes away they just get worse. I mean, we still see bows and arrows in some places. So it's this notion that there's still ballistic missile threats, and now we've got hyper glide, it just doesn't stop.

MR. RITTER: I think the issue, not just in this room but for anybody here, it's not a policy issue, it's a cultural thing. People have got to get used to sharing data, and that's happening right now. You can't just populate the world and everybody have their own sensors.

But a key to that is the war fighters agree ahead of time what the priority is. Our success on some of these things, you know, if it's a missile attack in front of you, you go to the top. There's a lot of things that support space situational awareness and other things that you can still track the data and pass it to somebody to help make a decision.

A lot of data we know to pass on to the intel guys or whoever. So the trick of the thing is pre-planning. Lay out if this circumstance goes, what am I going to do? What here, what here, and why? People start to feel like they can support multiple missions, not just multiple domains.

MR. TRACHTENBERG: I'd like to piggyback on that for just a second. I would say resilience here is key. When we're talking about the C2 network, when talking about command and control, it has to be robust and it has to be resilient. Of course, there are all kinds of network threat out there that we need to guard against. We can't allow the command and control of systems and capabilities to be vulnerable.

How many of you have had your email hacked or some things like that? We know today we face those kinds of threats which a dozen years ago we may not have faced to this degree. So when it comes to ensuring the efficacy and the effectiveness of our missile defense capabilities, we know that command and control, which is an essential component, it must be both robust and resilient to face all kinds of threats.

MR. RITTER: One of the things we've been working with the CoComs, command and control everybody thinks is a bullet. But the fact of the matter is that sensor management is equally important. So if one goes bad, how do you pick up the load and how do you shift? We do practice that and we do it every day, to support the secretary's comment.

MR. BARRY WATT (ph): Thank you very much for your comments in regards to the allies. I appreciate that. My name is Barry Watt from the Australian embassy. I understand that the journey between the services to move from compatible to interoperable to integrated -- (inaudible). I'd be interested in your comments as to -- (inaudible).

MR. TRACHTENBERG: I think that's a valid point. Absolutely there is a policy component to that. We want to do whatever we can in order to integrate allies into the system and share information where we can. Australia in particular has been a great partner when it comes to these kinds of capabilities. I think there's even an Australian-American Leadership Dialogue taking place. So there are a number of opportunities where we engage, or seek to engage, with allies and partners in order to try to open the aperture a little bit as much as we can when it comes to the sharing of information. So rather than complicate the problem we can simplify the problem and get to an appropriate solution. I take the point, absolutely.

MR. WATT: (Off mic).

MR. TRACHTENBERG: That's excellent.

MS. : Along those lines, where are the services in integrating the command and control system and the standards that are needed so that (it's compatible ?)?

MR. RITTER: On the C2BMC, it's a joint -- MDA has got the lead but it's a joint service program effort. There are soldiers, sailors and airmen managing the sites and the equipment. We're responsible to keep it upgraded and operating. They operate it and use it and do that part.

There was an agreement a while back that it's a system that crosses the (sole service elements in the Air Force -- I mean, the (MDA ?) to maintain the lead for technical integration and that kind of thing. You're talking about the integrated fire control, which is different from command and control. Those aspects are -- we've got efforts underway to go look at how do we integrate those things together? It's still in its preliminary stages.

MR. : Not to be evasive, but it would be inappropriate for me to speak about the service equities with regards to that because that's not my position. They have great capabilities that are being fielded, and I think that they support the direction of the department as we look specifically at this mission set. But with regards to how the Navy integrates or deploys it, I can't speak to that.

MR. RITTER: And we do reach out to them as well as the Army IBCS (ph) cell. There's work underway, but we can't go into much more detail. There is technical and operational and lots of other reasons (that it's more difficult ?).

MR. ELLISON: Where is the Air Force on this? The Air Force would seem to be

the natural leader for coordination and so forth. Do they have any skin in the game?

MR. RITTER: Yeah, how they played that out, the air operations center belonged to them, were co-located with the Air Operations Centers. They run Cheyenne Mountain. They're co-located in those places.

So from a command and control perspective a lot of cases are co-located and share their facilities. They also provide the major -- after we built and furnished it over -- major sensor facilities like LRDR and the Hawaiian radar and those kinds of things. And the Air Force certainly has the space aspects to it.

So they're more on the sensor and C2 aspects. They're the ones that actually do - - typically in the AOC an Army ADC may be located in that facility. So if there's any (a priority ?) mission, it's air and missile defense. That is integrated, by its very nature, way before NDA ever existed.

MR. TRACHTENBERG: And it's not only domestic, we have overseas combined air operation centers as well, where (air forces ?) and others are responsible for integrated air and missile defense capabilities, as well as other capabilities.

MR. RITTER: And we share with NATO over there too.

MR. TRACHTENBERG: Absolutely.

MR. ELLISON: So , for instance, you have the (battalion ?) that's over in Ramstein that (has a separate picture ?) for air defense ?).

MR. RITTER: The (MINDAK ?) is the NATO portion of the BMD, and they own and operate it with some U.S. funding. It's part of the NATO contribution. Many times it into the Air Operations Center, which is U.S. only, if you've been to the base, on the other side of the base. So they share the same picture, but as you know there's a lot of things going on in the theater, not all missile defense. So those things that need to go to NATO, go to NATO. Those things that don't stay within the U.S.

MR. ELLISON: When you start adding hyper and all those threats -- It's not going to be one picture, it's going to be separate for the commander to look at?

MR. RITTER: You know, everybody wants one picture, but what does that mean? I've seen a picture where we had everything but the kitchen sink, and you have no idea what it is. The ability to go share --

MR. TRACHTENBERG: You need a briefing slide.'

MR. RITTER: We have the ability to superimpose all the data on one screen. That's not that hard.

MR. ELLISON: Any closing statement?

MR. RITTER: No, I'm good.

MR. SMITH: It's a joint mission. At the end of the day, while the services do train, maintain and equip, how you operate, how you fight, is always joint. So I think the agency is moving in that direction and we're all part of that one team.

MR. TRACHTENBERG: I think this discussion shows pretty much how far we've come. We've spent an hour talking about these kinds of issues. These would be some of the other issues that we talked about years ago, and I really appreciate being a part of this discussion. So I thank you (very much?).

MR. ELLISON: Thank to everybody joining us. Have a great day. Thank you.

(Applause).