061319 Air Force Association Mitchell Institute for Aerospace Studies, Reserve Officers Association, and National Defense Industrial Association Capitol Hill Forum with Retired Army Lt. Gen. Richard Formica, Vice President of Strategic Accounts at CALIBRE; and retired Air Force Brig. Gen. Kenneth Todorov, Vice President for Missile Defense Solutions at Northrop Grumman, on "A Practical Guide to Missile Defense Next Steps"

(For additional information on AFA/NDIA/ROA seminars contact Peter Huessy at phuessy@afa.org).

MR. PETER HUESSY: (In progress) -- to inform us of what we can do better, and in particular integrating air and missile defense issues, which my colleague Tom Karako who is here today, has been particularly insistent that we do, as well as, how do we fit in things like cyber and hypersonic and space as a war fighting domain, as they call it?

Just a couple of notes, tomorrow Fred Kennedy, the head of the Space Development Agency, will be speaking here. If you want to sign up, don't bother registering because it's closed, but come anyway. We should have about 180 people, plus or minus. The weather is going to be good, so Fred is going to have interesting remarks.

Also, we have two Triad events, if you're interested in speaking or sponsoring. One is on the 22nd and 23rd of August in Crane, Indiana, at the Navy base. We're going to be talking about strategic systems, nuclear systems, the triad and hypersonic and global strike. We're going to be doing both. On the 8th of October here in Washington, we're going to have Task Force 21 and Minot North Dakota and my company, co-sponsor together a nuclear triad event with is going to concentrate on building and maintaining the consensus on strategic nuclear modernization for the next decade.

With that, would you give a warm welcome to our friend Lieutenant General Dick Formica?

(Applause).

LTG. RICHARD FORMICA: Good morning. Thank you, Peter. We appreciate you continuing to lead this series of discussions, and I'm grateful for the opportunity to speak this morning.

It's a pleasure to be here yet again with my battle buddy, Brigadier General Kenn Todorov. This is the fourth time that we've had the opportunity to address this group together, and I'm pleased to be back to talk about missile defense.

Before I go any further, how many of you in this room were at last year's session when General Todorov and I spoke, just out of curiosity? Okay, that's interesting. I

know you were, because you're the guy that asked the hard questions. That's how I remember you.

The reason I asked is that one of my key themes is about considering missile defense within the context of offense-defense integration. I really streamlined my remarks today because I didn't want to say the same thing I said last time. I may include some of those -- I may add them back in for some of you who might not have heard them before, because they're relevant to what I'm going to talk about.

Again, because many of you are new, Peter mentioned in his introduction that my last assignment was as the commanding general of U.S. Army Space and Missile Defense Command, Army Forces Strategic Command, which is headquartered in Huntsville, Alabama. In that capacity I was assigned as U.S. Strategic Command's operational commander for Joint Functional Component Command for Integrated Missile Defense. So, what does that mean? That's a bunch of Army positions, but what does it mean?

First, it meant that I had responsibilities to organize, man, equip and train Army space and global missile defense forces, and I was the Army's force provider for space and GMD forces to U.S. Strategic Command - two roles. And then, finally, as the JFCC-IMD commander, I was responsible for integrating operational capabilities for missile defense forces with U.S. Strategic Command, Northern Command, the other geographic combatant commands, and with the Missile Defense Agency, who serves as the material developer. So, it's that operational view that brings me to a discussion on missile defense, and I think that's important to keep in mind.

Last year when General Todorov and I spoke here the Missile Defense Review was underway. Actually, some would say it was overdue at the time. At that time I offered three areas that I thought it was going to be important for the Missile Defense Review to address.

First, that it needed to establish a clear set of priorities. Second, that it be clear on the implications of building partner capacity with a realistic sense of what that means in terms of demand for U.S. missile defense capabilities. And, then, finally that it address offense-defense integration, and what that means especially with a clear understanding of the term "left of launch."

Well, the Missile Defense Review is out and it's not my purpose today to grade it on those three items specifically, or on its merit more generally, but I'll be happy to take questions if you wish. But I did come here today to carry on my annual pitch on offense-defense integration. To that end, I will offer some comments about how the Missile Defense Review deals with that topic. And, then, I'll provide some thoughts on how offense-defense integration is considered in the recently released Army Missile Defense 2028 Roadmap. If you haven't seen it, it's worth the read from the one service's perspective.

I remain convinced that we must consider the requirements for missile defense,

and our response to those requirements, within the context of offense-defense integration. Most of the time when people talk about missile defense, from my perspective, they always talk about it from the standpoint of the interceptor, and the interceptor only. It is now accepted -- and I think we've come a long way in this conversation -- but it's generally accepted that we're never going to have enough interceptors to stop all the incoming missiles.

So, it has become imperative that we consider missile defense within the context of the strategic implications first of deterrence, and then with full consideration of offensive capabilities and attack operations, and with passive defense. As I have said before in this forum and in others, we must consider offensive capabilities throughout the conduct of operations, from the time that we're in tension before operations start, through operations. We must consider the integration of both offense and our missile defense together, just like we did in the planning to conduct counter-fire operations during the Cold War.

We were never going to have enough artillery to defeat Soviet artillery with a traditional counter-battery fight. So, we had to conduct the artillery fight within this larger context of offense-defense integration. What did that mean?

First, it meant that rapid offensive maneuver. As we were pushing him back, he wasn't shooting at us and the further back we pushed him the more out of range we put his systems. The second is, take out his eyes. Third, proactively take out his capability to attack us, and it wasn't just artillery pieces, but it was command and control, it was fire control, it was logistics, it was the full range of capabilities. And then finally, it was counter-battery, he shoots at us and we shoot back at him.

I see missile defense in the same way. We spend a lot of our time talking about the intercept of the ones he shoots at us. That's the counter-battery part. But there's this whole other element of offense-defense integration that plays into the conduct of missile defense operations.

Offense-defense integration is more than just Scud hunting. Oftentimes when people think about offense they think about attacking his launcher and its Scud hunting. We'll never have enough ISR and we'll never have the timing right to just do Scud hunting. So, it's more than that.

It's lethal and non-lethal. This is the term that I'm going after, because I think it creates a lot of misperceptions. It's not "left of launch."

Everybody like to talk about "left of launch." It doesn't mean we don't want to attack "left of launch," we do. But it's "left of launch," it's during launch, it's after the launch. It is throughout the conduct of operations, and it's not just "left of launch." So, it's not "left of launch" and it's not Scud hunting.

It's about going after the full suite of capabilities that can attack us with missiles.

It is finding launchers, but it's also about command and control nodes and their logistics facilities and those other capabilities that allow them to deliver missiles against us. Which brings me to my critical observation of the Missile Defense Review.

On the very positive side, the Missile Defense Review does address offense-defense integration, and it articulates in its elements of the missile defense strategy the need for a holistic approach of attack operations, active defense and passive defense. It recognizes the need to invest in both offensive and defensive capabilities, and what it refers to in its language as a 'tighter offense-defense integration.' We also know the 730, or whatever the number is, billion dollar defense budget really does invest in both offensive and defensive capabilities, and that's a good thing.

So, some of that language is pretty good. Here's my critical observation. Oftentimes in the document, and it only takes two or three, when they use the term attack operations it is immediately followed by the phrase "and we'll conduct attack operations before launch."

My concern is, while I can't speak for the intent of the authors and what they were trying to communicate with that phrase, but using that qualifying phrase, for me, rings like a direct reference to "left of launch" and Scud hunting, "attack operations before launch." So, while the overarching language is sound, a reader -- and words are important, by the way. In this town precision in language is key. While the overall theme of offense-defensive integration is there, a reader can leave the document with the notion that attack operations are something that occurs before launch, period.

So again, it is not my intent to nitpick. I think that limits the discussion, and it must be broader than that. It's not just before launch, but it's conducted in concert with active and passive defense throughout the conduct of operations.

How does the Army's recently published roadmap, AMD 2028 address this? It takes its lead from the Missile Defense Review, and as a subordinate service documents it's very consistent with the Missile Defense Review, which is a good thing. It, too, addresses missile defense within the broader context of offense and defense integration. Because it is a service document, it actually has a little bit more how to, in it. Army 2028 discusses the role of air and missile defense and the Army's concept of multi-domain operations.

It clearly articulates the role of missile defense as a deterrent capability during the compete -- and they don't use the phrase in missile defense operations -- but during the compete time, which we're in now. We should not assume that those who would do us harm are sitting idle today. Compete assumes that there are already activities, cyber or otherwise, that are already going on, and during that phase missile defense has an important role as it contributes to deterrence.

It contributes as a defeat capability during penetrate. When we need to penetrate their A2AD capabilities, it becomes part of the defeat. As they shoot missiles at us, we

absolutely do want to do active defense and intercept those.

But then it says, in concert with offensive fires and other strike assets, missile defense will contribute to the defeat of enemy long-range fire systems during the disintegrate and exploit freedom of maneuver phases of missile defense operations. That is, for me, the essence of offense-defense integration, and couldn't be said more clearly. So, that's a good discussion of that, and it sets the framework as we continue to have these discussions.

We've made great progress since we started talking about offense-defense integration, and I'm pleased with the attention that it gets in the discussion of missile defense within the context of attack operations, active defense and passive defense, and not just any one element. So, I just want to reinforce for this audience -- and I'd be happy to talk about it in your questions -- that we not limit the discussion to "left of launch," and that we eliminate the qualifying phrases when we talk about offensive operations or attack ops. It's too limiting.

Offense-defense integration begins with deterrence and extends throughout the conduct of operations. It's "left of launch," it's after launch, and it's right of launch. If I didn't say that enough to drive it home, it goes for the full range of capabilities and it's not limited to finding a launcher or Scud hunting.

Given that, and I mentioned these last year as well, I will continue in this forum and others to advocate for offense-defense integration in three critical areas. First, in our doctrine. Just like AMD 2028 captures multi-domain operations, which are not yet doctrine in the Army but it's an operating concept that will lead to doctrine, offense-defense is how we'll fight. Yes, we'll deploy THAAD, we'll deploy Patriot, and we'll position Aegis BMD capable ships. But we will do so along with the forward positioning or deployment of offensive capability. It's how we deter, and it's how we'll conduct operations.

Second, organize. We will contribute to the implementation of offense-defense integration by how we organize our forces. At the strategic and operational level, it's U.S. Strategic Command, which has global strike and missile defense. You have one global command that brings together the offensive and defensive capabilities and makes those available in support of the geographic combatant commanders.

At the operational level we have the creation of the Army's multi-domain task force. If you think about it, in the Navy we have battle groups and Aegis ships which are already inherently offense-defense organizations and platforms. And at the tactical level, I will advocate for the creation of truly multi-functional fire brigades.

Then finally, the third element is material. As I said before, we're one technology away from having a ground launcher that could fire both offensive fires or defensive interceptors, either by interchanging pods on the same launcher and adjusting the fire control solution or having a multi-functional pod that contains both capabilities, like the

VLS on an Aegis ship. We're not there yet, but we're one technology away. When it comes, it will have implications for how we organize, man, equip and train our forces.

To that end, there's a lot of talk about hypersonics in the material realm. The development of hypersonics will both have an offensive capability for us, and a defensive challenge as we must adapt our missile defense systems to be able to intercept this non-ballistic missile threat. General Todorov will talk more about that in a minute.

So, what's my message in summary? One, we can be reassured that the Missile Defense Review and the services are advancing the discussion of missile defense within the context of offense-defense integration. But two, as a caution, we should make sure that our language is not too limiting, and avoid creating a misperception that this is all just about before launch. It's not.

Finally, this discussion has implications for our doctrine, how we'll fight, for our organizations, and for our material development. As I close and get ready to turn the microphone over to my battle buddy, I always like to remind audiences in discussions on missile defense that while we tend to talk about technology and policy and doctrine and the like, truly when we talk about missile defense it's the Soldiers, Sailors, Airmen, Marines and Civilians that develop, deploy and operate our missile defense systems that are the true critical asset to the United States of America. It is for them that we must continue to have these discussions.

Thanks, and I'll turn it over to General Todorov.

(Applause).

GEN. KENNETH TODOROV: Thanks, General Formica, and good morning, everybody. It's good to be back. I want to thank my friend, Peter, and the Mitchell Institute. I also want to thank my battle buddy and mentor in many, many ways, General Formica, for a chance to be with him again today.

If you'll indulge me for just a second, I want to point out somebody else in the room whom I'm very proud of. I'm going to embarrass him for a second. My son, Aidan, is here. He just graduated from McLean High School and is an honor graduate.

General Formica always closes his talk talking about the airmen, sailors, soldiers, marines, civilians, coastguardsmen, who really this is all about. I'm very proud of Aidan, who on his own decided that he's going to be joining our great United States Navy and going to be having a Navy ROTC scholarship at Villanova University. So he's following that path and I'm very proud of him.

(Applause).

It sort of pains me that he's going Navy, as an Air Force officer, but then when I realized that he had a scholarship I was over the moon delighted, of course.

(Laughter).

MR. : It could have been worse. He could have joined the Army.

GEN. TODOROV: You say, it could have been worse? Apologies to General Formica, of course.

MR. : Now you can get tickets to the Final Four.

GEN. TODOROV: Exactly. I want to hopefully segue from where General Formica was, and I want to talk more about hypersonics today. I, too, talked about hypersonic threats last year at this event, but I want to focus today on the imperative for the defense, why we need to consider the defense. I absolutely buy into what General Formica says about offense-defense mix. He's been saying it so well for years. We need to continue to talk about that.

But there are still some out there, believe it or not, who are saying, this hypersonic challenge is just too hard. It's not solvable, we're going to spend way too much money on it. Let's just focus on the offense. It's almost a problem in reverse. If we just do this big offensive strike stuff, we don't have to worry about the defense.

I think that too is not a good way forward for our nation. So I want to build the case for you today about why the defense, why the imperative for defense, why the defense matters, and almost the argument in reverse, it's got to be a defense-offense mix as well. Hypersonic, or as my friend Tom Karako will cringe, hypersonics is certainly the buzz word of the day, of the year, or the last couple years in missile defense. There's a lot of talk about it.

I used to put $5 in a jar every time "left of launch" was mentioned, and I eventually brought a Tesla with it. Today I've got a new jar, every time hypersonic is invoked a put another $5 in it. I don't know what I'm going to buy yet, but the jar is growing in amounts.

Melanie Marlowe did a pod cast on it recently in "War on the Rocks," about all the hype in hypersonic. Indeed, it's an oft-overused term and a lot of people don't really have a great grasp of what it really means. So, I want to talk a little bit about that today.

It is generally accepted by the public definition as something that travels greater than Mach 5. That, I think, is maybe the Webster's definition, but we've seen and observed in flight testing, and we've actually seen these things flying from our adversaries in the Mach-teens and Mach-20s. So, it's a vexing problem for sure.

Our adversaries have fielded this threat to fly in-between our existing defenses. They've deliberately developed it and built it to not make our existing defenses obsolete, because that's not true, those are still very important, but to fly their way around those

existing defenses and sensors.

Our sensors can't even today reliably see it or track it, at least not birth to death. So a perfectly timed misdirection could draw us into a conflict with the wrong adversary. It's a serious problem.

So, what do we do about it? Well, there's no such thing as a free breakfast, ladies and gentlemen, so I'm going to ask you to participate. Everyone has to raise their hand one way or another, to the extent that you have an opinion. When you think about the hypersonic threat, or a series of them, do you think it's more of a regional threat, more of a threat to our presence in the forward regions, or do you think it's more of a threat to the homeland?

There's no right or wrong answer, I'd just like your opinion. Everyone has to vote. Tell me if you think it's more of a regional threat to our nation. Okay, that's maybe 40 percent of the room. I'm guessing then you think it's more of a threat to our homeland? Don't be shy if you think it's more of a homeland threat. I don't know if there's a right or wrong answer here.

MR. : It's both.

GEN. TODOROV: It's both, okay, maybe there's no right or wrong answer. But I guess my point was, for me anyway, if where the focus needs to be is on the defense, my personal opinion is that it needs to be focused more in the regional context. They're still very, very strategic, but it is to me today more of a regional threat, and our adversaries wouldn't choose to use the threat to the homeland before they might choose to use it in the deployed area.

Think about or forward presence, a carrier battle group. Think about Guam, Kadena Air Base, our shipping lanes, our commerce, our freedom of navigation. Even if you calculate that the strategic threat will never materialize, there's no denying the regional threat. Without the ability to counter it, we will slowly and steadily be pushed back and boxed in.

Even if a hypersonic missile is never launched in aggression, we are on the back foot, constantly withdrawing, moving out of harm's way, unable to stand our ground; or we are knowingly leaving our blood and treasure unprotected in that harm's way. The rippling geopolitical implications are no less severe. Every political, economic, social act taken today is a luxury afforded by the presupposition of physical safety, a presupposition often taken for granted yet nevertheless guaranteed by our great United States military.

This protection has led to global growth, freedom and prosperity unprecedented in human history. But now that very system is at risk through these threats, to a single party systems seeking to supplant it. Even if no kinetic strike is ever launched, the shift in balance will have drastic consequences. As the United States goes, so too goes world order, I would argue.

So, the scenario we are facing, the problem that we must solve, in my opinion it's much more of a strategic theater issue but a regional one with heavy strategic consequences. So, how do we stop it? For such a dire situation the solution is actually conceptually simple, and the subject of my talk today. We defend. We must change the game. It's our imperative.

For those of you in the room who are offensive strike zealots or believers, and to some degree I am too, rest easy because strike is an integral part of this defensive posture. Just as you can't launch a strike if you've been knocked out of the game, defenses can only endure for so long before breaking. The ability to hit back lessens the damage we need to absorb to survivable levels. Offense and defense, as General Formica so eloquently just told us, needs to work together in all phases.

But if we have no defense, our adversary's calculus is simple. Their missiles will land. They can plan their attack. They have singular control of that dimension in the forward regions and can push us away and push us out.

But with a capable defensive system the stakes of pulling the trigger for them just got a lot more complex and a lot bigger. The adversary no longer holds all of the cards. With any formidable defense the adversary's 100 percent certainty drops, and the risk and calculus increases exponentially.

What does it take to ensure that a decapitation strike succeeds? How many missiles do they actually need to sink that carrier? They have to think now more about it, as opposed to having freedom of action at least in the region. Indeed, defensive systems buy us time, plenty of time in fact, to both respond to an aggression and, due to adversary uncertainty, time to fully employ our own instruments of national power.

My final point regarding the imperative for defense, it's important to bring up that history has already shown us the way. The mere idea of a credible defeat system -- decades ago, SDI drove the Soviets to try to build enough capacity to assuredly overwhelm our systems, but they never knew how much that really was. With our continued investment in missile defense, the finish line kept getting farther and farther away. For every dollar we invested in defense they had to invest far more in their offense. This formulaic relationship ensured the uncertainty of success was not only present, but ever-growing, becoming an ever more efficient deterrent for us.

So, in reality, the defensive posture is proven. It works and it is absolutely a necessary part of the equation. But again, I'm struck by the fact there are still naysayers out there saying, let's just focus on offensive strike with regard to hypersonic threats. We don't need a defense. I absolutely think that we do.

But if you're going to do it, you absolutely need to do it right. Whatever the solution, it needs to be thorough and it needs to be robust and it can't be a band aid. It has to be thorough and robust enough that it cannot be easily disabled by resetting the

adversary's conops to a defense-free scenario. The defensive architecture must be resilient, and once again, band aid fixes are not resilient.

So let me offer a few thoughts, philosophically, on how we might go about this. First, we need to execute and we need to do it efficiently. Given the complexity of this threat that means a layered defense.

We absolutely need a layered defense. No one band aid in any one of the regions or regimes of flight, or a last chance terminal defense band aid, is going to be sufficient by itself. We've got to get at this threat at the glide phase, and that means a lot of things, including a space layer, which thankfully we're starting to see signs now of progress toward that end. We're not there yet, but I noticed in some recent action across the street here, there are some good signs.

A space layer is clearly the first step because as my friend Vice Admiral John Hill likes to say, if you can't see it, you can't hit it, and we need to take that first stop, finally.

And, it also means a new interceptor. The existing inventory of interceptors, and strapping extra boosters on them and trying to modify them somehow, are not sufficient enough technologically to handle the advanced threat at the speed at which it flies. So, we have to consider that.

But really my point is about a layered defense. A proven concept in conventional missile defense, it's also necessary here to provide credibility against hypersonic threats given the shortened windows of engagement. Due to speed, we need to see the threat. Due to maneuverability, we need to be ready to intercept the same threat at multiple points simultaneously.

A networked, layered approach uniquely provides this capability, while also minimizing the number of assets needed at any one time, as the subsequent layer only needs to deal with those threats that have leaked through the previous layer. Layered defense preserves the economic viability of any defensive option. So one, layered defense.

Two, our execution requires new technology. Existing systems are fundamentally incapable of addressing this threat based on their foundational conception for countering conventional and altitude-based or altitude-layered battle spaces. Our current systems are designed for either exo- or endo-atmospheric intercept. Conceptually, those two categories might as well be as different as defending against missiles and defeating against torpedoes. Assets tailored to each type of those fights lose their efficacy when out of their element.

Hypersonic threats skip along the barrier between exo- and endo-strata like a rock on a pond, and travel freely between them like a dolphin jumping on waves. The implications go far beyond physical intercept mechanics, affecting all other aspects including visibility, identification and predictability. No number of updates to existing

infrastructure will be sufficient to change their fundamental development philosophy, especially not in an economically feasible way. Consider the new elements that need to be made.

Which brings me to my third point, and that's really about it has got to be all about an architecture. Yes, we absolutely must build upon the massive wealth and knowledge of our existing missile defense systems and components that we have, but I'm not talking about throwing away the existing ballistic missile defense system. That remains important.

But, we need to continue to do more and we must take a fresh look at the hypersonic challenge and problem, rather than trying to MacGyver -- I hope that's not an analogy lost on many of you younger people in the room -- rather than trying to MacGyver something on top of what we have in the hope of getting to something good enough. Good enough today is obsolete tomorrow. With hypersonic threats, chasing good enough is an exercise in futility.

Finally, achieving proper defense requires true commitment from both industry, where I reside today, and government. The MDR got us off to a good start, but rhetoric is only the beginning. The nation needs a strong commitment to funding counter hypersonic efforts: such as a new space layer, as I mentioned; a new kinetic interceptor or interceptors perhaps, that build on a layered defense that I talked about; investment also in non-kinetic things like electronic attack and cyber and directed energy.

Those things all hold promise and are all an important part of that layered defense equation. And, most often overlooked, the command and control architecture to knit these assets together and make them function as a system, rather than a stand-alone entity band aided onto the existing BMDS. Doing this right is going to mean having some entity of leadership integrating all of those critical elements together so that we don't Frankenstein our way into solving this problem. There needs to be some sort of a super integrator, an orchestrator assigned, resourced and empowered to ensure we get this architecture right.

It can't be done with discrete parts, but taking a system of systems approach is as essential as any single element of the architecture. The interaction and seamless cooperation of these various elements of counter hypersonics must be baked into the very requirements of future programs. Those requirements are the standards to which industry is held and against which solutions are judged and ultimately awarded.

For our part, industry must work together to help government partners choosing to invest, helping to inform, and assisting them in making these requirements so they are clear and concise. We need to be involved early, which is now, actually yesterday, helping to make sure these systems work well and integrate together. So, layered defense, a series of new technologies, an approach that thinks architecture first, and commitment from our government and industry partners.

I'll leave you with this. There's a lot we need to do in this area, and every reason to do it. So, we need to get it done. This threat is serious, it's real, we need to consider the defense. We can't do it just with a strong offense because, as General Formica says and points out so well, the offense-defense mix is so vitally important and it holds true here in the world of counter hypersonics.

Thank you very much and I look forward, with General Formica, for your questions.

(Applause).

MR. MATT GALDEN (ph): Hi, I'm Matt Galden, a nuclear security fellow on the Hill. I would like to just ask you guys to kind of draw a few lines. It seems like we're talking about the Ballistic Missile Defense System -- which was designed and stated for when we pulled out of the ABM Treaty -- was designed for rogue states and lower level threats like Iran and North Korea, versus the advanced and more sophisticated threats of China and Russia.

So in these discussions we kind of talk about integrating the existing BMDS into this counter hypersonic weapons regime. North Korea and Iran aren't fielding those weapons. It' still unclear in the open source world how far along China and Russia are in fielding those weapons. So now we're king of talking about tweaking the BMDS and then all of a sudden shifting it towards focusing on Russia and China.

Having been on an Aegis ship, I know that we already kind of talked about that. But still, the capacity and the way it was designed and the way we signal that to China and Russia were very different than the way we're kind of seamlessly moving this discussion in that direction.

The other thing is also, hypersonic cruise missiles versus boost glide ballistic missiles. They definitely require different things. From a strategic aspect I'm a believer that the strategic game in terms of defense of the homeland hasn't changed a lot because there's still a lot of inability to adequately defend against intercontinental ballistic missiles. So some of the old deterrence architecture is still the bedrock on which it was built.

From a cruise missile standpoint, there are a lot of very advanced cruise missiles that China and Russia field. I'm having trouble seeing where this goes. Is it revolutionary and such a huge threat, or more just one big step in the technology game. We're already dealing with very advanced anti-ship cruise missiles and land attack cruise missile that strain our defenses.

Is this just one more advance. I'd just like to ask you to tease that apart a little bit and downgrade the hype, because I feel like a lot of stuff gets lost. The devil really is in the details with these.

LTG. FORMICA: I'm trying to figure out what the question was. That was a lot.

MR. GALDEN: Yeah, I apologize, but just separating out the strategic from tactical and then ballistic missiles or boost glide vehicles from cruise missiles.

LTG. FORMICA: I don't think that anybody up here said anything about shifting our BMDS to go and counter Russia and China. We did not. We talked about -- I talked about offense-defense integration with the missile defense systems that we have today.

Our GMD forces are designed for a limited attack against a rogue threat. I haven't postulated anything that would change that. For the conduct of operations against a threat, I would argue that you've got to have both offense and defense capabilities, and that's the essence of my remarks.

The advent of increased threats, like hypersonics, which may change the discussion for counter hypersonics to not just the BMDS system, but how are we going to counter those capabilities? And that may be that it's Russia or China or others that can create that kind of capability. I'll let Kenn speak for himself, but the point is that there's going to be a threat capability we've got to have the ability to defend against it. I don't see a blurring of those.

GEN. TODOROV: First of all, your comments were excellent. You're a naval officer? I'm just curious. You served on an Aegis BMD ship?

MR. GALDEN: On my first tour, and then I was on the USS Gerald Ford.

LTG. FORMICA: For the record, we know that an Aegis ship is a multi-mission platform and it's not just a missile defense capability. We know that. I learned that lesson.

GEN. TODOROV: I don't recall where you raised your hand in the regional versus homeland things. Where were you on that?

MR. GALDEN: I thank that kind of comes to tactical versus strategic, when it comes to hypersonic weapons.

GEN. TODOROV: I'll start where General Formica started, which is not to suggest that we're throwing the BMDS out or we're totally revamping the ballistic missile defense system to focus solely on these threats. By the way, you're absolutely correct to make some distinctions in hypersonic glide and cruise missiles. There are various numbers of things that we have to be concerned about and we can't just put them all in the same category. But you're absolutely right to make that distinction.

I believe that the BMDS as it exists today will always remain a viable deterrent for our nation. But I also think that if we do nothing and we don't focus on defense against these new kinds of threats, that we're leaving ourselves very vulnerable. My

particular view is it really does erode our forward presence, which is really I think the calculus of our adversaries.

It's not in their best interest to necessarily strike us at home, although they hold that card, I suppose. But really, it is designed as more of a tactical, with a very strategic threat, if they threaten your former shipmates that are cruising in the Straits of Malacca and we have no response to that.

That layered approach I talked about is not just about kinetic. Block III, in the context that you probably understand very well, non-kinetic means is -- we've got to have a bunch of tools in the toolkit for the war fighter to help make sure that we maintain that freedom that I discussed that maintains our security and prosperity around the world. That's my view. But excellent observations and points, and I'd love to chat with you more about that.

MR. RON GLEESON (ph): Ron Gleeson and the question I have is, you start with -- you say begin with the end in mind. My question to you is, how do you define success on the nuclear deterrent? For the last 70 years plus the nuclear deterrent was focused on mutually assured destruction. If you go your route, which we all think we need to do, if the end in mind is to have a defense system where you're not worried about your adversary at all because we can defend against them, what effect does that have on mutually assured destruction?

LTG. FORMICA: I'm not sure how you bring those two together. Mutual assured destruction, to me, has a specific connotation in the nuclear realm, nuclear deterrence, the nuclear ability to respond.

I think if you take the argument on hypersonics it could very well be a conventional fight. That's a discussion that's maybe somewhat related, or tangential, to mutual assured destruction and nuclear deterrence. It could be a conventional missile defense fight. The fact of the matter is, if they've got a conventional hypersonic capability we need to be able to respond with both offense and defense to be able to keep that from being a threat to us.

The notion of going forward with just offensive capabilities to deter him from using -- to deter the threat of using hypersonics, as Kenn points out, is not sufficient. You've got to have an ability to defend it. On the other hand, you can't just build defenses and say okay, good, we've got enough defenses. He's never going to shoot us, that's good enough. It's that mix.

MR. THOMAS KARAKO: This has been two very profitable presentations with a lot of material, and I hope the transcripts will be available because this is some good stuff here. I want to emphasize the discussion of regional versus homeland defense. I'm not going to use the phrases tactical or strategic because you can go down a rabbit hole very quickly.

But regional versus homeland begins to map a little bit to especially point versus area defense; also the dichotomy you developed between kinetic and non-kinetic and between the glide and the terminal phase. The challenge would deal with emphasizing -- and I think you're right to say the regional is probably more important because it's kind of a better anti-ship cruise missile than it is a replacement for an ICBM -- but it's hard to get lots of kinetic interceptors and then move them around with you. That's going to push in the direction of the non-kinetic things to kind of keep it mobile and all that kind of stuff.

So, I was glad that you emphasized the non-kinetic solutions, but that of course pushes towards the terminal phase, unless you can find a way to elevate those non-kinetic solutions or push them out and put them in the air or something like that. It strikes me that the non-kinetic solution to this particular challenge is probably worth a lot of investigation, but there's a tension there between trying to kill it way out there and do it with non-kinetic (assets ?). I think this kind of explains the reluctance to kind of go dump a lot of money into a bigger, faster kinetic interceptor. Thoughts on that?

GEN. TODOROV: I think you made the assumption that it's got to be bigger, necessarily, and hard to move around. I think you can have a new interceptor that potentially is very mobile. It could be land-based, it could be ship-based. I don't know that it necessarily is hard to put it forward.

Back to the point on layered defense, I think you do need both. I think you need a kinetic answer to the problem, but -- I don't want to say in a latch ditch effort -- but many of the non-kinetic solutions that technology is available for today are going to be sort of a terminal defense. Again, I don't want to say last chance to get it, but if you reach out and try to get it in the glide phase, you at least have an answer for an electronic attack or try to spoof it off its way.

Directed energy doesn't necessarily have to burn a hole through it, it just has to disrupt it enough so it doesn't hit its intended target. I think those things have to play together, and if you try to put all your eggs in any one of those kinetic or non-kinetic baskets, it's not going to be efficient. Or, that layered defense approach that I talked about won't be effective.

LTG. FORMICA: I like this question about strategic versus regional as well. You and I, Kenn, responded differently on that. I was a little conflicted when he asked the question, but what I really liked was the line he had later that talked about the strategic implications for regional applications, or words to that effect. That's really how I see it, it's a capability that they would have to execute A2AD to keep us at standoff. So, how do we defeat that?

Is that regional? I guess it probably is, but it's got strategic implications. So, where we forward position the lethal capability, or where else it's mounted, whether it's in a carrier battle group or wherever, I do think that there's both a land and a maritime capabilities.

But like the previous discussion, I agree with Kenn, it's not either/or. We've got to be careful that it's not yes, we're going to do it with non-lethal; or that we're going to go after it with lethal. We're not going to put money in this because we're going to put money in that. Just like my larger discussion of offense-defense integration, that's got to be lethal and non-lethal too. I would argue it's not just non-lethal capability to go after that specific thing. How do we use our non-lethal capability to preclude his ability to conduct operations that would result in a hypersonic launch? It's the broader offense-defense integration that requires both the application of lethal and non-lethal capabilities.

MR. JIM FELDMAN (ph): Jim Feldman, Munitions Industrial Taskforce (ph). If you will grant me a couple of assumptions? One, the technical difficulties are overcome. Two, the Army's very aggressive fielding schedule happens.

LTG. FORMICA: That's a stretch there.

(Laughter).

MR. FELDMAN: But some day we're going to face the problem. My question is, how do you envision any authority to release -- I'll use the choir -- hypersonic missile from the guy who's going to pull the lanyard or push the button? What type of system do you envision to grant authority to fire a potentially strategic weapon?

LTG. FORMICA: That is a great question. But again, I don't think it's any different than any of the other capabilities that we have. I mean, we have strategic capabilities that require National Command Authority decisions to execute. Once you get into the conduct of operations, those authorities tend to get pushed down a little bit. Combatant commander may have that authority.

That authority question, I think is different if it's a first strike. We can get into the whole pre-emption conversation, which I'm not here to debate today. Pre-emption is a whole other bag of worms. But I think having that capability gives combatant commanders lots of options. That's what we want to give to them, is options.

I think that the other problem, by the way, is not just solving the authority issue. Who will have the authority to launch that? Those decisions can be made in advance of operations or can be withheld until operations start.

Probably the bigger challenge is the targeting. Do we have the ISR capability to find it? The longer range at which we can shoot means the longer range at which we must see. We've got to be able to bring those two together.

So I think it's both, can we target it in a timely manner in order to be able to use it, and then who has the authority to say yes in a timely manner to make it effective. I think that's a great question. But not having solved those issues now shouldn't keep us from developing the capability, because we clearly need to be able to defend against that

capability.

MR. HUESSY: Thank you, generals, both.

(Applause).