

Mr. Riki Ellison:

Good morning everyone, ladies and gentlemen. It's a crisp, cold fall day here in Alexandria, Virginia. I'm Riki Ellison. I'm the Founder and Chairman of the Missile Defense Advocacy Alliance. We founded that 20 years ago. And I have been involved with missile defense since 1980. Our whole purpose, our intent is the deployment and evolution of missile defense systems around the world, to make our world a safer place, to save lives and prevent conflicts. And we are seeing acceleration of the proliferation, both in combat over in Ukraine with Russia, and in demonstrations with North Korea and China. It's been an exceptionally rapid pace. And a lot of that has got to do with the fact that our country, our allies, and our partners don't have capabilities in place today to be able to defeat that threat. So they are leveraging that up, that capability.

We've been very close to the European Theater. We spent some extensive time there this summer with NATO, with US Army Europe, with US AFE, and got a pretty good grip of what was going on in the August timeframe. And they again, everyone again was pushing hard for integrated, layered missile defense capability and architecture for all of NATO on that. And that's where the strive is going for. And we recognized the greatness that's happened both within our joint force and within our allies, and certainly within Ukraine, of doing some marvelous stuff with what they've got, and they've got limited capability, but they've done some stuff and they've made this a little difficult, and have shot down missiles and drones to be able to help out on this. We're very honored and we will be hosting with the Netherlands in February, the European Missile Defender of the Year, February 4th, to recognize our allies and partners in Europe.

Today we need to think through on, step back a little bit and think through on the bigger picture of what's going on in the world. We are seeing President Xi of China and President Putin of Russia lowering deterrence. You saw the speech over the weekend by Xi. Russia's continued acceleration of different ways to attack Ukraine through ballistic missiles, through drones, and you've seen them lower that deterrent factor. Our job as a community, as a world, is to raise that level in deterrence, to fight that lowering and raise it. And missile defense is a key component of that, and it just can't come from the United States. It has to come across from our allies joined, excuse me, joined and through our allies and partners. And this is going to happen in these gray area states, in Taiwan and in Ukraine, where it's a gray area. And we have to be able to integrate a full architecture of layered capabilities that are here today.

We can't wait for five years or 10 years. We have to go with what we've got. And we have some great systems, and there've been some great systems. We'll talk about what can go in there now, but that has to be done. And getting the C2 right. Most of these countries, and certainly Ukraine, have Russian systems and Russian C2's. We've got to break this and create an architecture that can have everybody jointly fit in. It's a big challenge, it's a big ask, but to do what we need to do as a world, to raise the level of deterrence that has to be done. And this discussion today is about what we can do in Ukraine, because if we can do it there, we can do it anywhere. And this is so critical right now. Our country spent over 18 billion in supporting this fight. And so this is where we're at. So I welcome you.

Our first speaker is a great friend, a brilliant guy, Ty Thomas, former Lieutenant General. He served over 32 years in the Air Force. He's had extensive experience in Europe as the Director of Operations, Strategic Deterrence in Nuclear Integration Headquarters over there at Ramstein Air Base. It's brilliant. So Ty, I'll put it over to you on what we can do in Ukraine to make this thing better for everyone.

Lt Gen (Ret) Jon "Ty" Thomas:

Okay, great. Thanks. Good morning, Riki. Good morning, everybody out there in the audience. It's certainly good morning to my fellow panel members. It's an honor and privilege to be on here with you. I apologize for the seatbelt as I'm in transit. But Riki or Dave, can you give me a thumbs up that you can hear me, first of all, that we got a good connection? Okay, Awesome. All right, so I'll try to set some of my comments up here to frame the discussion a little bit that I think we're going to have throughout the hour period, hour plus period we've got here.

And what I really want to start with is big picture, which is what is 21st century modern warfare in our era characterized by? It's characterized by a lot, but I would say definitely facts are, is that it's characterized by long range precision strike weapons. And what we're seeing in Ukraine right now, we're approaching 4,000 ballistic missiles and cruise missiles launched by the Russians against Ukraine. Not every single one of those precision guided, some of them not, but a significant portion of them are. So when you're watching video footage of a Kalibr cruise missile cruising by, that's exactly what I'm talking about. And if we think that, "Oh, the Russians have expended all their rounds and so it's going to take them a long time for them to catch up." Maybe, maybe not.

But just look at the PRC. Okay, so Riki mentioned that we've got to make sure that we're considering what they're doing. They are fully loaded to bear with long range precision weapons, cruise missiles and ballistic missiles of various ranges to force decisions on the part of their adversaries about how to deal with that threat. If we then look at it and say, "Oh, well, but it's not really a threat to us in the United States because they have to be able to have the targeting coordinates and everything to be able to actually strike with those long range precision weapons." And we can do things to their national system so it's a little bit harder. Then we need to also look at the second, one of the second significant aspects of warfare in the 21st century, which is the significant development and availability of commercial imagery.

Commercial imagery, whether it's electro optical infrared, or whether it's even SAR imagery or whether it's going to be additional sources of RF sensing. But there are enough sources, alternative sources that we should expect that to include four targets here in the United States of America, our homeland, that our adversaries have targetable coordinates for key elements of infrastructure forces, command and control, all of the kind of things that we would do if we were going after striking key targets in their area, or the area of our objective areas.

So the question then is, "Well, do we really believe that that could happen?" Well, in the regional area, I think we're all convinced of that, we understand it, we see it playing out in Ukraine. We understand the threat to the first and second island chains as well as mainland Japan and other regions in the Pacific. But then you go, "Well, what about the US homeland?" It's a long way away. We've got these two oceans that have been wonderful moats for us, and they're never going to really get close.

Except for we need to understand that both of the Navy's of our two great power competitors have attack submarines. They don't necessarily have the capabilities that we have in the US Navy. But if you're wondering about what the Russians have, you need to understand that they have a sub called the Samaritan, that's the first of the class. And when that sub goes out to sea, it gets the attention of the Second Fleet because it has significant capabilities, capabilities that can strike the US homeland. The PRC, or the PLA Navy doesn't quite have those capabilities yet. But I don't think that we discount the Shang-class of submarines, they're working on others. And their patrol areas may not be the ones that put us at risk, but to discount that possibility I think is, I'm not sure I would do that as a commander.

And then there are air launch weapons. So much more advanced on the Russian side, but their bare bomber fleet is capable, it's proven, it's been around as long as our B52's have been, and they launch long range weapons. So I build that picture simply to say that this is not only a regional problem, we're seeing it play out live regionally, but it is a homeland problem. So then it gets to now bringing it down to a little bit of brass tax. We are making investments in acquiring capabilities for not an ally, but a partner in the form of Ukraine, and we're offering them and presenting them very significant capabilities in the forms of NASAMs as a system. The question we should be asking ourselves is, yes, we understand the approximate cause for doing that, but why are we not doing the same for the United States homeland?

If you agree with my line of thinking that the United States homeland is at risk, we all understand ICBMs, but at risk of cruise missile attack, why are we not fielding similar or the same systems? Yes, we have one to defend the national capital region. I understand that. But if you're the commander of USNORTHCOM, General Van Herck, you've got a critical asset list that's as long as your arm. You have a defended asset list that's as long as your thumb. That disconnect is something that we as a nation should be addressing. And if you say, and I'll cite a recent article that came out in Breaking Defense, this kind of thought could be manifested in multiple different sources. But if you go to that article, it's a great discussion about how

the United States Army is thinking through concepts of distributing logistics and other things in the operational theaters so that they are not subject to saturation attack. That works. Those are the same type of concepts that the Marine Corps and the United States Air Force are doing. How do we at home distribute the port infrastructure associated with Naval base San Diego? How do we distribute the key infrastructure in the Puget Sound region? Or how about our space launch facilities that are at Vandenberg Air Force Base, Vandenberg Space Force Base or Patrick Space Force Base? We don't. We have to be able to defend them because they can't be dispersed, and yet these are critical elements of war fighting infrastructure in a major peer conflict. So the last thing I'll close with, and I'm being somewhat poking at both my own service, the US Air Force, that now has responsibility directed by Deputy Secretary Hicks to develop the architecture for cruise missile defense in the homeland. We need to get going, we need to get organized, we need to identify who the senior leader is that's going to lead that effort.

And then for the Army, let's take a look at the 34 highest modernization priorities in the United States Army. If you look down that list, the first six are some form of additional long range strength, whether it's Prism, whether it's LRHW, whether it's mid-range capabilities. And there is a place for that in war fighting. I would also say that those are joint force capabilities that are duplicated elsewhere, maybe not in the quantities that we need, but if you look all the way down to number 15 on the list of 34, that is the first place that you find active missile defenses. And there's about three or four more right there in the middle of the modernization priorities for the United States Army. The question we should be asking ourselves is why are those not higher? Especially when we have this dilemma associated with homeland defense. And the fact that we know adversaries are going to do this because we see it happening in the Ukraine.

Let's ask ourselves that question and let's produce a solution as to why. I think we know how to do this. I'll stop there, Riki. I know there's a lot more coming. I look forward to the conversation and the questions. Over.

Mr. Riki Ellison:

Yeah. Ty, I just want to follow up with you on the NASAM deployment that's going on in Ukraine. That weapon system is only carrying the 120 AMRAAM, not the AIM-9X, which is a much cheaper version. That's a heat seeking sidewinder missile that we have distributed to 29 other countries. Why are we not able to have a complete suite of a layer of defense inside that NASAM for Ukraine? And let me ask you another question too. Why don't we have that AIM-9X here in the Washington DC capital? Why have we focused on the 120s and doesn't, because that's a common weapon system, that's a common, every country has it for their fighter planes that Gripen, our ourselves and so forth. How do we move that in a direction where it needs to go? Or can you just help me understand that?

Lt Gen (Ret) Jon "Ty" Thomas:

Yeah, and Mark, I think in his comments may be able to touch on this as well because I think he's recently talked with some folks that are technical experts on that system. But from my understanding, as you mentioned, because the AIM-9X capability is a recent add, it is possible that the AIM-9X multiple, there's variants of that missile, there are probably some release-ability questions that need to be addressed. And so that could be part of it.

It may be simply a matter of time where it may be the US government has decided we're not willing yet to make the investment to add that capability to the National Capital Region system that's defending it. I fully agree with you, we should. So I would submit that it's probably more of a release-ability question and possibly an affordability or just a requirements question as to why the variant of NASAMs with the AIM-9X hasn't been fielded yet or isn't going to be sent to Ukraine at that present. Remember, it's also a production issue. There are two units that are going to go in the near term and the additional fours for NASAMs were lead time plus 18 to 24 months based on the fact that they've got to be produced from the very beginnings. Hope that helps Riki, over.

Mr. Riki Ellison:

One last question. I think there's some great movement with the Deputy Secretary of Defense and putting more pressure on the US Army to spend more money on air defense, but there still seems to be the firmness that the US Air Force has the architecture for the US homeland. My question to you is what are we doing in Europe? Who's in charge of the architecture? Should the US Air Force be in charge of the architecture for this or a NATO country, or how do we lead this to get it full, integrated, layered defensive architecture for NATO, combining ballistic, hyper all the way down to crews and possibly drones?

Lt Gen (Ret) Jon "Ty" Thomas:

Well, in Europe, Riki, and I'll throw the Levant in here as well. I mean there are two missions associated with, and this is ballistic missile defense. Okay? So there's the mission that's in defense of NATO, and this is where the two Aegis shore sites and Aegis BMD and all those assets come in, and that is a NATO mission. So that's who's got the architecture and the capability development responsibility.

Mr. Riki Ellison:

Cruise missile defense is that part of that cruise missile defense has no part of that.

Lt Gen (Ret) Jon "Ty" Thomas:

I'm getting to that. You're absolutely right. In the Levant and assistance to the bilateral defense of Israel, again, a ballistic missile defense mission, and that is primarily now that Israel has transitioned, it's a US responsibility to work with them on that particular mission, even though it touches on the Yukon AO. The third is, okay, so for the rest of things that are ballistic missiles oriented towards those two particular areas, who's responsible for it? I would submit that for the US element of its USEUCOM, and so USEUCOM and its air and its subordinate components to in particular the air component at USAFFE have the responsibility for developing the architecture, advocating that they can't pay for the capability development and then also integrating. And now this is a NATO element for AIRCOM integrating other capabilities.

There are significant Patriot capabilities, SANT capabilities, RST capabilities that the allies bring to bear in NATO. It's a luxury that we have. Mark will tell you, I think they've got better capabilities than we do in Europe right now, but I would submit that level cruise missile defense, Yukon's and its air component are new to and are leading the charge on development of that. I mean the defense of Ramstein Airbase as a key node today is better than it was eight years ago when I was the Commander at Ramstein because of focused work that USEUCOM and its air component have done. Over.

Mr. Riki Ellison:

Okay, thanks Ty. That was great. Our next speaker, great friend, thank you Ty. Former retired colonel, Dave Shank. He was in charge of the 10th AAMDC. He also was in charge of the Doctrine of Missile Defense back at Fort Sill, Oklahoma. Dave, welcome from Jacksonville. I believe you're in? No, I'm sorry, in Florida. And you survived the hurricane, so you look good. It's all yours.

COL (Ret) David Shank:

Yeah, thanks Riki, and thanks to your team for helping out and setting us up. Thomas just alluded to the colleagues on the net and the expertise that they provide. Always a pleasure to be here and just a bit south of Jacksonville, but nonetheless, the temperatures have cooled. But what a beautiful day here and again, thanks for having me. I want to follow up just on one thing that Ty mentioned to start off with and that's the 34 plus one army priorities. I thought that was a great point of what he brought up and his spot on with regards to where is the air and missile defense on that list of priorities. And it is somewhere in the middle, I believe Ty said number 15, so I'll go with number 15, but with the IFPC. The goodness in this,

and I'll circle back, is for this fiscal year 2023, the expectation is 23 of those 34 plus one priorities will be fielded.

Now the question remains though, where does the air and missile defense, where are those priorities and will they be fielded? So as we know, continued challenges with regards to time, space, and of course the cost to get capability in the hands of the war fighters. So much more still to be seen as we just kicked off the start of this fiscal year on October 1st. So with that said, Ty kind of covered the big picture. I'd like to narrow it down based on my area of expertise, which I think is the land component and the integrated air missile defense problem set. And the challenges that currently face not just in the European theater, but really globally. And of course we've got a number of bad actors. The Captain Obvious here is Vladimir Putin and Russia. Ty mentioned China. Of course, we've got the Iranians pumping in capability in the way of drones amongst other pieces of equipment into Russia to be used in the Ukraine.

We've got what appears to be at least an open source ammunition and other type of systems from the DPRK, North Korea and elsewhere. So I bring all that up as there's a significant problem on our hands in the European command in the European theater. The challenge first and foremost is the capacity that it just doesn't exist within not just the 10th AAMDC, but as Ty alluded to the allies and partners also on the continent. Yes, they bring a significant weapons capability to the battlefield, but at the same time, each of these individual nations, not only do they report to their respective leadership, but they have requirements as well. But as we look to the eastern flank and the conflict ongoing and now going on, my numbers are right since February, eight months, there's some goodness in this as the Russians do not own the airspace. And I think Vladimir Putin was probably very confident that he would have their superiority early on. And so the goodness there is the airspace remains contested. And to include the reports that Russians, a number of their aircraft are not even entering into the Ukrainian airspace. They're actually firing from either Russian or Belarusian or even the Black Sea into Ukraine. Ty talked about the long range weapons, some precision, some not precision, and the numbers total and greater than 4,000 missiles and long range rockets and both ballistic and cruise missiles and the challenges posed there and what we've seen in the news with regards to targeting of infrastructure and power facilities and so forth. So back to the capacity piece with regards to what's currently in the Ukraine, we've seen a number of systems committed both from the US specifically in this case, the Stinger Missile.

We know there are other capabilities that were committed from some of the European nations and elsewhere around the world. The question that remains though is what is the command and control inside the Ukraine? And then how is that command and control being managed along the eastern flank? So outside of Ukraine. During my time at the 10th, it was a significant challenge with regards to command and control. When you talk about a large number of nations, again following the direction of their leadership, and then of course you factor in some of the policy challenges. I'll tell you an experience I had, I'm dating it a little bit in 2017, but nonetheless, it took us several days to come to fruition with a full blown architecture across the Eastern flank from Bulgaria, north through the Baltics, back to the Kayot Utem in Germany. And then a linkage all the way back to Ramstein. Took several days to have that link in place in order to have a shared air picture.

And so the challenge is, again, policy was driving this challenge, but the challenges do exist. And so how do we overcome that? What a great opportunity. There's an old saying, "Never let a crisis go to waste." Well, what a great opportunity to knock down some of those barriers and develop that commanding, that control and that architecture and leave it in place, whether it's in a cold status or warm status. And I get the security concerns and the challenges that exist with regards to cyber and so forth. Never let a challenge go to waste. The other opportunity again with the lack of capability in Europe is how do we push capability into the Ukraine in an effort to bring on 21st century capability to the other nations that are donating these systems, that are contributing these systems, that are providing the training to the Ukrainians that are providing additional security resources and formations along the eastern flank, whether it's up in the Baltics, whether it's in Poland, in Romania, Bulgaria, Slovakia and so forth. How do we follow up in an effort to not only build that command and control architecture, now you develop and you feel the additional sensors across multiple domains as well as the effectors, both kinetic

and non-kinetic. Just real quick, Riki, if I may, with regards to the schoolhouse challenges, there's a lot of, "Hey, why don't we put Patriot or THAAD into Ukraine or push it towards the East?" Well, that exists, and some of that capability is stateside. But when you tie this to a schoolhouse, these are very technical systems and it takes several months to train American soldiers, not just Americans, there are plenty of international fellows who attend the schools there at Fort Sill, and then go back to their home country and execute that training that they received. But it takes months to gain a clear baseline of understanding and capability based on a soldier or service member's skill. Riki, I'm going to stop there. I'm sure you got questions.

Mr. Riki Ellison:
I do, yeah.

COL (Ret) David Shank:
So I'll pause there.

Mr. Riki Ellison:
Okay, Dave, let's start off with the drone threat right now and the Stinger effectiveness. So they got a lot of Stingers, is that an effective capability? But you'd have to place them wherever you have to place them. And we know C-RAM works, C-RAM, we deployed that in another partner nation Afghanistan, we've got a lot of them. Why aren't we moving those? If we can give them to Afghanistan, why aren't we putting C-RAM over there along with NASAM and possibly Iron Dome, but talk to me on why that's happened or is this Stinger capability good enough?

COL (Ret) David Shank:
Well, I think if you ask the Ukrainians that question, they'd say absolutely not. But what I will tell you is regarding the counter small or Counter UAS, Counter Unmanned Aerial Systems, the JCO out of the Pentagon, they've done a phenomenal job just in the short term existence that they've been around. I believe the JCO was activated or directed for activation in 2018 if my year's right and the capabilities they provide, I mean they've demonstrated a number of those, not just in training at the schoolhouse or down in New Arizona but in the Middle East. So this capability's been demonstrated. So is there an opportunity to move some of that capability from the CENTCOM AOR potentially? Is there an opportunity to leave that capability in CENTCOM and position a new capability, not only along the Eastern flank but also into Ukraine under the billions of dollars committed by the President of the United States and the administration? Regarding C-RAM, there's 20 something systems at one time that did exist. There were systems left in Afghanistan unfortunately.
So that is a capability. It does exist, that some may question whether or not the US and the Department of Defense should make a recommendation to push that capability forward into Ukraine. Iron Dome, I think when you get into the Iron Dome capabilities, and I don't speak for other nations, I don't even speak for our nation, but there's some challenges involved with sharing that capability. And then of course the Stingers demonstrated we've read quite a bit of open source and unless you've had your head in the sand, there's quite a number of videos that show shoulder fired systems doing what they're intended to do. And that's to take down aerial targets, both drones as well as, I believe it was last week, there was video of a Ukrainian soldier firing on a cruise missile.

Mr. Riki Ellison:
Dave, just following up on that, that's Major General Sean Gainey, he's done a phenomenal job on doing everything, I think three and below, drawn three and below. And they've had tremendous success and CENTCOM, they've shut down the Iranian all that threat, but they've done it with nine to 12 different systems there and they don't have the restraints of doctrine that you would have in Europe that you would have in the Middle East. I mean that's lasers, that's all sorts of stuff. Just real quick, is that a doctrine

challenge to be able to put some of this new technology and defending cities and stuff like that from what we're doing in CENTCOM?

COL (Ret) David Shank:

Well, I think when you talk about the group three and below, so groups one, two, and three of the five for County UAS, and this is across the Army, these aren't just air defenders that were being trained and as well as a mobile training team, mobile training teams, excuse me, that went forward into CENTCOM to help support the training of not just service members but also the inner agency. And so a little bit different of a training, problem set, if I could use that term when you're talking a shoulder fired weapon or a handheld piece of kit versus a, for example, a Patriot Battery, which is 58 to 65 soldiers that all working together as one in all critical parts of the team to ensure that the system is in place and ready to fire. So there's some challenges when it comes to training. The bigger weapons systems obviously take longer, they're much more technical and a little more of a challenge to not only just certify as I mentioned as a large team, but then deploy that weapon system and prepare for a combat environment.

Mr. Riki Ellison:

Thanks Dave. I appreciate the Army perspective on this discussion. Our next speaker is on our board, Mark Montgomery, retired Rear Admiral, Mark was the Director of Operations at UCOM there for a while. He's extensive. He's one of the best thinkers in the world I would say on this capability. So Mark, I think we'll focus back on Ukraine a little bit. We've gone very broad and look forward to hearing from you on your thoughts.

RADM (Ret) Mark Montgomery:

Hey, thanks Riki. So yeah, I'm going to look at it through the three issues. One first Ukraine, then NATO, then the US. And so look, first this is great news. The first thing I'd say is probably within the next six weeks we're going to have our first combat experience with NASAMs and I think they'll successfully shoot down Russian cruise missiles. And this really reflects the speed with which this has happened. Very few of us would've predicted it could go this fast. And anyone who's worked on these issues before knows that they're really moving mountains. And I think a lot of credit should go to the Department of Defense, the Ministry Defense of Ukraine and Raytheon, the company doing this. This is significant work and it's being done really well. The first two are going to be transferred faster than I could have expected, that's going to get them to firing units.

Now let's be clear, depending on how they communicate with the batteries, this could be a very small to small defended area. It is not going to give you a large defended area with two firing units, but you are going to have, be able to protect, you can choose to protect it a midsize city or you can choose to protect critical infrastructure spots, go out to where electrical power generation stations are and protect them. But you're going to have to make decisions and it's going to be challenging. And I think the six more firing units coming in 23 or 24 for a total of eight are going to again make a difference. And hopefully they'll come reasonably rapidly. And I assume that the people that Raytheon trains today to go operate these units, we'll transition into the trainers for the next group of Ukrainians coming through so they can grow their force. This has got to be hard.

This is generally an English A system with consoles and technical manuals in English. And there was a limited number of skilled surface to air, air defense operators to begin with in Ukraine. So really great, fantastic work by Raytheon, US Department Defense, Ukrainian Ministry Defense. But look, I do believe NASAMs can shoot down in a drone just like I think Stinger can shoot down a drone. And I think neither one of them is really optimized for it. C-RAM, as you mentioned earlier, on the other hand, is absolutely optimized for it. And in addition to the four or 500 at least, successful rocket engagements it's had in the Middle East, it very specifically had success against Iranian drones in January of this year. So we know it works. The exact number of units isn't publicly available right now and that's because as the Colonel mentioned, Dave mentioned some stuff was left behind in Afghanistan.

But before we get critical, you got to remember that stuff was probably protecting the ex-filtration of the last few aircraft. So at some point you just have to leave something behind. Hopefully it wasn't too many of those, but we need to get together, figure out what's not being used in the Middle East right now or what can be released from the Middle East and then figure out whether we want to get something over to the Ukrainians in the C-RAM world, and do we want just start converting them? I mean there are Phalanx guns coming off of decommissioning Navy ships. There's maybe some opportunity there to create these, because in the end, most of us know C-RAM is just an adaptation of a shipboard Phalanx gun system with a lot of extra add ons, but in the end that's the core component to it. And look, that's going to be a lot easier to train on than NASAMs, so I think they'll be even faster in getting it to the fleet, getting it to the force, the Ukrainian forces, if they choose it.

And I do think Iron Dome's very good against drones. The problem with Iron Dome is going to be the political position this puts Israel in vis-a-vis Russia and they'll have to make decisions there. As I recall, we have a couple Iron Dome units for no apparent reason. Potentially we could transfer those that will take more training. That might even be a third language depending, I think the ones have been altered for the United States. So the US ones would be easy enough, but there's some opportunity there. But that's another trading event and that's not as good an ROI. You know it's going to be \$80,000 around or so to take out the drone. But that's still a lot better than NASAMs, a lot better than say a Patriot system. So look, in Ukraine big change is coming. It will not completely handle the threat because there's going to be small defended areas, but NASAMs and then we are going to have to find something else. Either give them, I don't think there's a lot more Stingers to give them so that you can at a low intercept probability, keep launching Stingers at them, or at a lower intercept probability or can we transition them to C-RAM or Iron Dome.

And that leads me to my next thought that's on NATO. Look, what's going on in Ukraine right now is we're basically converting the Ukrainians to a Western air defense system. And I think we need to apply this mentality throughout Eastern Europe. So the rest of NATO, Eastern European NATO particularly, needs to be fully transitioned to Western air defense systems over the next several years. And look, right now we do not have enough cruise missile and defense systems in all of NATO. So bringing them onto these systems will contribute to the overall readiness of NATO to deal with the Russian threat.

Patriot's a good system and it's an exceptionally expensive cruise missile and defense system. The outgoing Patriot round cost between three and four million a round. That is not the kind of cost benefit or return of investment you want shooting at a \$50,000 cruise missile or a \$200,000 cruise missile or an even cheaper drone. So these are things we have to think about. So probably Patriot and plus Patriot has SRBM responsibility, Short range Ballistic Missile responsibilities and other things. So there's other things are UK has Sky Saber, the French and Italians have SAMP/T, but there are a bunch of NASAMs out there. To my knowledge, I think there's five NATO countries that hold, excluding the US one for our national capital region that Dave mentioned earlier, as did Ty. There's Estonian, obviously the Norwegian's words, built originally Spain, Dutch and Lithuania. I think and Finland, the newest to join NATO country soon has it as well. So that'll get us up to six, and I think there's three countries with orders, Hungary, Estonia and Latvia.

So it's coming in and we need to integrate it fully. And I think it has some core characteristics that you want. And here I'd say NATO needs to set some principles. I mean the principle is we need to get enough capacity to defend our critical airfields, our critical logistic sites and our pre-positioning. We need to remind ourselves we spent 10 to 12 billion dollars over the last five years storing wheel and track vehicles all over Europe so that the US can fall in on a couple armored brigade combat teams. And that stuff's undefended right now from this kind of threat. So the first principle, get enough capacity to defend yourself. The second principle, it needs to be interoperable like Link 16 interoperable so that you can communicate and it can be controlled effectively by an Area Air Defense Commander. And then it needs to be reasonably low cost because the Russians build at a reasonably low cost. And you don't want to be exchanging my three million interceptor for your \$100,000 missile, and we need to make sure it's reasonably maneuverable.

So when the Air Force moves to a remote airfield, something can go with it. When a NATO Air Force moves to a remote airfield, it's reasonably deployable and maneuverable. So when you think about that NASAMs investments by our European allies, Sky Saber investments, the UK's available for that, those are going to be important things. I question in this regard Germany talking about Arrow 3, I don't know how interoperable that is and that's going to, I think, introduce some challenges for us. So something to think about. So NATO has some work to do.

And finally I'll talk about the US I'll make it quick. I mentioned basically defending the airfield Ramstein and earlier. If we say that's a NATO problem, we've still got a problem in the Pacific. We got to defend Misawa in Japan and Anderson and Guam. And the short answer is we need NASAMs in the US, more NASAMs in the US for structure. Whether it's the Army, the National Guard, I think we should be agnostic. But you absolutely have to do it. It's long overdue. Congress told the Army to do this in 2019 and then told, suggested to them in the conference report use NASAMs, gave them money to purchase these systems. And the Army after significant delay and lack of transparency, eventually picked the Iron Dome system, which was not a cruise missile defense system. So I would just say we've got to go back, review that decision and figure out how to get NASAMs out in the field soon.

The train maintains a quip exists for it, because the National Guard does it for the National Capital Region Defense. But we've got to be able to do that. And then look, there may be a long term Army solution coming around the corner, but most of us know the system. FPIC, it's like the Phoenix Suns, it's been two years away from being two years away for a decade. At some point you got to buy what works. So getting NASAMs in for the defense of Guam and other missions in the Pacific is critical. So that's three things, Riki, you got a Ukraine good news story, a NATO starting to get their act together, and then the US surprisingly considering how well advanced we are in almost any other war fighting area needing to play catch up. That's my take on the issue.

Mr. Riki Ellison:

Thanks Mark. I just want to follow up with you on both the C-RAM and the NASAM are not programs of record. I'm to understand in the fight up coming forward that the US Army has gotten 4,000 AIM-9Xs for their FPIC position. So as you can see, you can't wait.

RADM (Ret) Mark Montgomery:

Yeah. So I think what you're referring to is the Army is predicting over the next five to 10 years, they're going to have to buy 4,000 AIM-9X missiles for FPIC. Here's some good news for you. If FPIC remains two years away from being two years away, the AIM-9X can be integrated into NASAMs and you can use those missiles. And let me tell you, we know how to produce AIM-9Xs. We're world class AIM-9X producers, AIM-9 producers, I would imagine we're more than 10,000 missiles built to date. A number of them fired in combat obviously from aircraft. So we're pretty good at that, and I'm not worried the FPIC challenge will not be the interceptor. The FPIC challenge is going to be the integration and the fire control system and the launcher. And so from my perspective, all those situations have been solved in NASAMs. So I'd at least do a gap filler. If I was the Army, I'd want to get the joint force off my back and get this done, and I can't explain this. I sometimes think the US Army just kind of doesn't want to fixate on defensive missions. They are the most world class butt kicking offensive Army in the world, I think we all acknowledge that. But in the Pacific and in many of these other areas, we need them to also have this critical defensive capability. And I think at times they don't embrace it the same way they embrace some of these other, certainly the way they embrace their artillery mission where they have not let their foot off the gas in the last 20 years. And so I think those AIM-9X purchases, were they to happen can be used for NASAMs.

Mr. Riki Ellison:

Okay, thanks Mark. We'll open it up to questions for the last 15. So I'll let you host the questions, Mark. Haven't heard you. Mark, you have to repeat that. We can't hear you.

RADM (Ret) Mark Montgomery:

Sorry, I was on mute there. First one was for Ty, you addressed this a little bit in your comments, but if you could take a moment to kind of explain how what we're learning in Ukraine is applicable to how we think about the cruise missile offense of the homeland.

Lt Gen (Ret) Jon "Ty" Thomas:

Okay. Yeah, thanks Mark. Well, you mentioned in your comments that we're going to provide the Ukrainian systems that will defend a certain area. You mentioned small, medium sized city or whatnot. I think we think through know the way that we're doing a solution development for that problem and apply that to Homeland Defense. For cruise missiles, let's just focus on that for a sec and then go, what is the US Air Force is the aid for cruise missile defense in the homeland need to do? The answer, and we're talking a lot about NASAMs simply because that's an improving capability that exists now, and we can get our arms around. If it was built by somebody, there's nothing special about as great as the engineers, everybody's done the work, it was somebody else don't care. The fact of the matter is it's the capability that exists today that we can get it.

So to take the Homeland Defense problem and say whatever solutions we come up with to fight against the cruise missiles that the Russians have thrown against the Iranians, is there a reason why that cannot then to mold multiple sites in the United States? And one of the other important things associated with the type of systems that NASAMs is, which is sensors, which is fire control, which can link into other sensors that we're building an Army crowded on, they're fielding LTMs. It's a very capable system. There are other very capable systems across the drill force. So we can link this existing set of capabilities for fairly rapidly to procure a set of capabilities to provide doable sets of cruise missile defenses for the homeland. The examples that I threw out, the Southern California region of key assets or the Pacific Northwest, or let's use Colorado Springs, let alone sites on the Eastern seaboard.

The fact that you build packages like that, that can then produce some defense in depth of key turning critical asset list items into intended asset list items is what we can and should be doing. Let's not wait to go, "Hey, let's architect something, give MBA three or four years or longer to develop the capability, test it out, demo it, and then by 2029, we've got something to defend parts of the homeland." For us to wait that long is a massive, massive mistake. And the answer is, we don't have to because we're solving this problem for the Ukrainians, and if it's good enough for them, I think it's going to be good enough for key sites in the United States. Over.

Mr. Riki Ellison:

Ty, would you put this in Guam right now? Part of the architecture for Anderson? Would you put this in Alaska right now for those two bases?

Lt Gen (Ret) Jon "Ty" Thomas:

Hands down, Riki. I mean, so what do we have for cruise missile defense on Guam right now?

Mr. Riki Ellison:

Nothing.

Lt Gen (Ret) Jon "Ty" Thomas:

We can re-task, if we go up in terms of our threat posture, we can re-task and for that. Or we can get 17 C-17s and move a patriot minimum engagement package to Guam.

Mr. Riki Ellison:

That's not an architecture, it's amazing. It's not in the MDA architecture.

Lt Gen (Ret) Jon "Ty" Thomas:

It's not Riki. And that is one of our problems is that we have got to think through the fully layered defense and there's a role for each element. You know, guys talked about UAS, there absolutely has to be a UAS capability to defend key cells in the Second Island Chain. Maybe that's C-RAM, maybe it's lasers that are being developed. It's good work being done there at low scales. Don't anybody tell me that we can use a laser to take care of the class four and above threat. Show me the 300 kilowatt laser that could put the fluids on it that has the beam control and all the things that are needed to actually close the kill chain, and then I'll believe it. But right now it doesn't exist. So we've got to have all the layers and this is one of them and then we got to have it. Over.

RADM (Ret) Mark Montgomery:

All right, thanks. I'll take the next question. There's a great question here is why isn't the Army embracing NASAMs I believe I've probably gone on long enough about that, but the next question's a neat one. I'll take the first answer, Dave, if I miss something follow up on this. And then there's another question for you. So the next question is, as it means to mitigate eventual landfall and explosive capacity of a Russian missile shot by Ukrainian air defense. In other words, is there a way to make sure the warhead doesn't go off and this is because the Russians claim that civilian, that strikes in Kiev all hit their proper targets and any collateral damages the fault of interception by Ukraine.

Well, the first thing I'd argue is if you shoot a missile into another country, you now accept responsibility for everything that happens after that moment. If the Ukrainians launch a surface to air missile, it misses and it crashes into Uncle Fester's farm. You, the person who shot that cruise missile in the country are responsible for the damaged Uncle Fester's farm. If they intercept it and all, most of us who've seen a missile interception, things were going 350 to 500 miles to six or 1,000 miles an hour before the interception, they continue to go that speed after the interception, right? This isn't, it's not like Wile E. Coyote, two things hit and drop down. It's a massive shrapnel event with everything parting at near the speed it was at before the event. And then that rains down on things including eventually the warhead. Now the warhead usually does not go off in a secondary on the ground because damage occurs to its fusing mechanisms and things like that. But any damage that occurs from that is again, the unique responsibility of the party that fired the target in the first spot. So from my point of view, Ukraine doesn't have to defend itself for the impact of any weapon fired or any action that happens. Russia is 100% responsible and I don't need an engineering investigation done by the International Criminal Court to help me figure that out. Dave, did I get that about right?

COL (Ret) David Shank:

Yeah, I think you nailed it. Gravity gets a vote, so debris will reign down. But back to your point that it's a Russian responsibility.

RADM (Ret) Mark Montgomery:

That's right. Yeah, thanks. Hey, so Dave, there's a good question for you here. I did like that last question though. That's a good one. Hey, are we going to see as part of an air defense package going into Ukraine, microwaving based drone jamming or laser based systems, and to catch up on Ty's point against one in two missiles, group two drones. Is there that capacity or capability to transfer them right now?

COL (Ret) David Shank:

Well, I definitely think the high power microwave capability does exist. It's been deployed, it's been leveraged and it works. There's obviously a risk involved when you use that type of capability, high power microwave, that you could actually impact friendly forces. You could impact civilian infrastructure, you could impact a number of things when attempting to use it as a weapon system against, in this case, a Russian, Russia. Regarding lasers, I agree with Ty. I think we're still some time away from developing. I've fired a 300 kilowatt laser at West Point, so lucky me, right? But as Ty mentioned, with regards to that, I mean holding it on a target for a period of time, and that's after you identify the target

and you're able to take a shot. But for a 50 KW laser, which it just fielded the first platoon, they're in the process of putting that striker based platform of the 50K laser at Fort Sill, Oklahoma.

There's some challenges involved when you start talking about firing lasers. And the first that comes to my mind is what is the laser burnout? What does that range look like? How do you clear that airspace? How do you integrate lasers with counter UAS systems and all the other layers of systems that you desire to have, at least from a friendly standpoint. That's just the air missile defense weapons systems. Now how do you integrate it with friendly drones? How do you integrate it with friendly fixed wing, friendly rotary wing and so forth? So a very crowded airspace. And I still think we're a few years away from lasers. But lasers in the Ukraine, I don't see that happening. I definitely could see a high power microwave.

Mr. Riki Ellison:

Hey Mark, just can I just quickly here, what do you think about move and stuff from CENTCOM, whether it's C-RAM, Patriots, lasers, microwaves that we've been successful with and the GCC allies have got that capability, some of it, to going over. Is it worth the urgency or the risk that we've put on CENTCOM to put that into Ukraine or into Europe? Or do we just leave it?

RADM (Ret) Mark Montgomery:

Listen, if we've got something forward deployed defending our forces or our diplomatic posts, say in Iraq or in UAE, Kuwait, Saudi Arabia, I think it needs to stay there. And we're talking here specifically about C-RAM. I'm absolutely fine with transferring things that are Fort Sill or with the Ohio National Guard, whoever's maintaining the C-RAMs, that's fine, Fort Hood, wherever it's at.

Mr. Riki Ellison:

Got it.

RADM (Ret) Mark Montgomery:

But I would not transfer things that are defending operational forces forward. And look, within this year, the Iranians launched, I mean some Iranian rebels backed by Iranians using Iranian supplied equipment, launched drones at the US diplomatic facility in Baghdad and they were engaged by a C-RAM. So from my point of view, that's justification, right there. There are things that you could probably take from CENTCOM unrelated to this that are a whole different description.

Mr. Riki Ellison:

Let's go to the real question then, Mark. We got five THAAD batteries sitting right here in the United States. Why aren't they, at least one or two of them, out of there? What's the problem here with that?

RADM (Ret) Mark Montgomery:

I think first of all, well two things. I think to do this, the Army's got to start thinking about forward stationing the THAAD. In other words, the Army defers in Korea and in other areas and in Guam to deploy units where you rotate the forces underneath it three to one. Guam is an actual Pacific Paradise Island. I would PCS everyone there. You know, can PCS people, lots of people are PCS, Permanent Duty Stationed to Korea. If you have a deployed to dwell issue with THAAD, then just send one team and align one team with that. If they do, in the absence of that, if everything's at deployment, then they're going to have real problems with the personnel numbers maintaining multiple ones on station. So this is really about big Army coming to grips with things the way the other services do. The Air Force and Navy and soon Marine, Marine Corp are going to have a lot of PCS people on Guam, and they don't have significant retention or attrition problems associated with that. Most of the sailors, Airmen, Marines end up liking it.

Mr. Riki Ellison:

But Mark, I mean Japan and Tokyo and Ramstein is just what you said. You can perfectly put them there just like you did with one.

RADM (Ret) Mark Montgomery:

There are commissaries, we already got the commissary, the PX, the school, the baseball field, softball fields, it's ready to go. And in fact, many of those places, Germany used to host 350,000 US troops. They're down in the 57,000, they're slightly under 20% of their number. There is capacity to take care of them. There's capacity in Japan. These are decisions about how the Army thinks about deployments that were related to ... and look, it comes from 20 years of habitual behavior formed in the Middle East and they just need to break it. The Middle East ones still need to deploy the way they deployed, but not the others.

Mr. Riki Ellison:

Got it.

RADM (Ret) Mark Montgomery:

And let me lock out the last few questions here in our last couple minutes and kick it over to you Riki. There's a good question here about munitions and missile sustainment and what these drones might mean. The munitions challenges in Ukraine are fortunately the product of Ukraine using the munitions. The biggest munitions challenge is a GMLRS, the Guided Missile Launcher Rocket System round extended, that's a, we'll say 70 kilometer round launched from a HIMARS weapon system. So the HIMARS themselves are an issue and the number of GMLRS rounds and then the number of M77 howitzer, your 155 millimeter rounds for howitzers, those are a big issue. But it's from usage, not from Russia successfully hitting them. Now with these Iranian drones, we've got to worry about these things. So I will tell you, the HIMARS are going to have to protect themselves. I don't think it's reasonable to expect an air defense system to maneuver around with them. They're going to have to use their maneuverability and their ability to hide in culverts and forests and things like that to protect themselves. But the NASAMs units and the harpoon launcher units, which are maneuverable but don't maneuver a lot, they are going to need some kind of counter drone protection. In the end, NASAMs will try to protect itself. But I would be getting C-RAM systems there pretty rapidly to defend those areas. And I think there's one more question here. And the question is, do we think that these are being done, that these NASAMs are going to be made predominantly with Ukrainian Army or outside contractors? Everything I've heard looks like the Ukrainian army. I mean, I can't swear up and down that Ukraine isn't going to set a contract with a company and have some expertise come in for technical advice. That might be something. But I think the traditional train maintain equip kind of responsibility for the NASAMs is being transferred to the Ukrainian Army. And again, does that mean there's zero contractors in place? I don't know. It's something someone can ask the Department of Defense spokesperson, but the plan is broadly based on the Ukrainian army. Riki, we knocked out all the questions, about nine of them. I want to pass it.

Mr. Riki Ellison:

Yeah, I got one left for you.

RADM (Ret) Mark Montgomery:

Go ahead.

Mr. Riki Ellison:

Is it believable that we can create an architecture completely Western? Is that real for NATO or is that going to be, I mean that's a massive project for the Eastern European NATO countries and partners. Is that feasible in 10 years, five years, two years? Or how do you do this?

RADM (Ret) Mark Montgomery:

Yes, and I want to carefully define Western. So the new Polish cruise missile systems being built now are Western. They're being built to Western standards with an ability to link into Western systems. The polls have already bought Patriot, although I think that is a burden their budget bears every year. It's a tough one. That was a pretty expensive item for a military their size. The answer's yes. And the answer is not least-

Mr. Riki Ellison:

But as Dave said the C2 seemed to be the hardest thing. The C2.

RADM (Ret) Mark Montgomery:

Yeah, well the C2, if you buy Western systems, you're buying access to the Western C2. And look, eventually Israeli systems will be in that as well. I do think there are issues with that that aren't completely clean yet, but we need to get to that. But the ones being built in Poland, in France, in Italy, in the UK, in the United States, in Norway, they're all ready to go. They're effectively western systems and ready to and West-capable of being linked together in a NATO controlled environment so that the Air Defense Commander has the ability to properly manage the battle space with his Deputy, who's usually a senior Army official.

Mr. Riki Ellison:

Dave, you want to chip in on this?

COL (Ret) David Shank:

No, Mark pegged it. Then really it comes down to, he mentioned interoperability and he was much more eloquent than I could have described by using the term Western type systems. And he's absolutely right. Now's the time for these eastern flank countries who are pushing capability into Ukraine. And even if they need some financial backing, whether it's through foreign military sales or what have you, to support them in establishing a new set of equipment, which is interoperable, which can enter a network, a secure network, and receive a shared early warning as an example. And you can have that connectivity across a large swap, and in this case, up and down the Eastern flank from Estonia south to Turkey.

Mr. Riki Ellison:

Thanks Dave. Let's do our closing remarks. It's been a great discussion as always. So Dave, I'm going to let you have the first shot at the closing remark.

COL (Ret) David Shank:

Yeah, I appreciate it and thanks again for having me. Always fun. I don't have as many one liners as Mark does, especially the Phoenix Suns piece that I heard mentioned. But nonetheless, it's a challenging problem set, but look at it from a national security level, there are some concerns. Mark and Ty, Mark mentioned NASAMs, we've got it in our national capital in Washington DC. If it's good enough for DC, and Riki, you and I spoke about this.

I had the conversation with then Secretary of Army Mark Esper, and he asked me my thoughts in 2018, what do I think about NASAMs? My response was simple, well, if it's good enough to provide defensive fires to our nation's Capital, it's probably good enough for the rest of the Army. And that's not to poke former Sec. Esper, but a conversation I did have. But again, definitely a challenging problem set. The bigger the system, the greater the challenge in training troops as Mark laid out with regards to the NASAMs that have been committed and soldiers continue to train in order to get that capability forward versus the shoulder fired type handhelds that we had briefly discussed. So, hey, thanks for having me and I look forward to Mark's closing comments.

Mr. Riki Ellison:

Thanks. Thanks, Dave. Mark?

RADM (Ret) Mark Montgomery:

Hey, I've said enough, but I'm glad we've got a Ukraine challenge we're working on. Great job again by Raytheon, the Department of Defense and the Ukrainian Ministry Defense. That is something I would've predicted much more problematic than it has been to date. And I should say Kongsberg as well, I'm sure they're involved at least in some of the production. And then second is we got to get at this NATO issue. And the US has to lead, even though we don't have the system right now to lead with. I mean, we have it in the national capital region, we don't have it in Europe. We are the leader. We're the thought leader of Europe, of NATO, and we need to do that. And then finally, we've got to get the defense of Guam and the defensive of Marsal right against the Chinese, because all they are is Russia with a thicker inventory of better missiles. So we need to be ready for that. That's all I got, Riki.

Mr. Riki Ellison:

Yeah. Hey, thanks Mark. Thanks Dave. Thanks Ty.

This is really a crescendo of why we have to have this stuff and we can't wait. We can't wait five years, two years, a year. And we've got capability that can save thousands of lives. Thousands of lives are going to die if we don't put this stuff in. And we could be in a World War if we don't put this stuff in. In Guam, in the First Island Chain, in Ukraine. And we've got real capabilities today. We don't have to create them. They're there. They need to be moved into these regions to deter, to raise that level of Deterrence, we're not doing that.

So Russia and China will be more aggressive until we start doing that. And we got to work together as a team joint and partners to get it. We know we got NASAMS there, we know we got C-RAM we can deliver. And we got to get the C2 thing. That C2 thing is huge. So it's there for us. It's being forced the hard way. We're losing lives getting destroyed over there in Ukraine, that's forcing us. But we have to do it. We've got the capability, we have to have the political will to make this happen. And we're going to do everything we can to make this happen because it saves lives and prevents wars. So thank you everyone. We enjoyed the discussion, the conversation. Really appreciate it, Mark, Dave, Ty, thank you very much.

COL (Ret) David Shank:

Thanks Riki.