

Mr. Riki Ellison:

(silence).

Mr. Riki Ellison:

Good afternoon, ladies and gentlemen. I'm Riki Ellison. We're here in a very crisp cold day in the Washington DC area. We wish you a Happy New Year. We wish you resolve and resilience as we battle COVID, as the world battles it through it.

Mr. Riki Ellison:

We're very excited today to bring forward, I think one of the most pressing prolific issues in the world today, and that is the small unmanned vehicles and countering those vehicles, and reducing the cost curve that our nation faces to create really not only a defense, but a deterrent against those that are proliferating these systems.

Mr. Riki Ellison:

I am the founder and chairman of the Missile Defense Advocacy Alliance. We were founded in 2003. Our sole mission is to advocate for the evolution, development, and deployment of missile defense capabilities to defeat missiles, drones, hypersonic strike, destructive weapons that are being proliferated in the world today. This is certainly one of our key areas and we are very fortunate to have capabilities in the theater today.

Mr. Riki Ellison:

We started this year off with successfully intercepting drones that were targeting our troops forward, our allies forward with these type of systems. So this has been a very promising statement to start this new year.

Mr. Riki Ellison:

General McKenzie of CENTCOM has put it right out in front that this may be the biggest prolific threat to his force structure in the Middle East. It certainly is not prohibitive just in the Middle East. It's in Africa. It's in even you can take it to Europe. It's in Asia. It is the poor man's and the cheapest way to put force protection, or excuse me, force projection on the US and its allies.

Mr. Riki Ellison:

So today we're very fortunate to have the Secretary of Defense's number one person that made this a significant mission, and they've put in Major General Sean Gainey as the Joint Commander to create a joint capability to defeat and defend these systems.

Mr. Riki Ellison:

Sean's not only just that, but Sean's also the head of the army's training and equipping for both long-distance fires or artillery and air defense. So that says a lot right there with that statement, the confidence the Secretary of Defense has in his ability to do that.

Mr. Riki Ellison:

So we're going to have an opportunity to have Sean talk to all of us about what they're doing and how they're doing it. And we've got former military with us and MDA advisors and board members that will follow him on.

Mr. Riki Ellison:

So I'd like to introduce Sean. Sean's been great. I've had an opportunity to be with him many, many times in his command at 94, as a major general for our 94th AAMDC across the Pacific. I think it's always great Sean, to see that you started with a chaparral and a stinger system when you first came in and you've never left it. And that's really a testament to your success. He's one of our up and coming great general officers in this country and in the world.

Mr. Riki Ellison:

So Sean, welcome, and the floor is yours.

MG Sean Gainey:

Thanks Riki, and I appreciate that introduction. I appreciate all you continue to do in this effort. And again, several trips in and around the Pacific AOR together, some of the same airports together. It's great to be sitting here, talking about another area that's just as important, the counter small UAS and what we are doing in the department to get after that.

MG Sean Gainey:

But before I really start talking about what we're doing, I'd like to pick up on where you highlighted starting off the year with recent successes. And I'd like to really highlight the great soldiers, airmen, and sailors out there that are manning this equipment that continue to get the maximum effects out of these equipment as we continue our best to field the best capability we can. And all hats off to them in their recent successes out there in this real world fight day in and day out.

MG Sean Gainey:

Back in 2019, early 2020, then Secretary Esper realized that how we were moving forward in the counter UAS fight with service specific focus probably wasn't the right way to move forward. Each service was getting a lot of counter UAS capability in gear out to the war fighters, but it wasn't synchronized, and we probably could have done it better.

MG Sean Gainey:

And so he rapidly realized that we need to take a service and put a service in charge of this effort and essentially be the executive agent for counter small unmanned aircraft systems, groups one through three, and that's really the area and how we classify them, one being your small quadcopter type, two, a little larger than that, and three, what we're seeing a lot in the theater and what you hear a lot about in the news, these larger drones, most of them, one-way explosive type drones that are out there, really these larger ones that we're talking about.

MG Sean Gainey:

And by doing that, it brought in an enterprise approach that enabled the protection of personnel material and missions from a growing threat and hazards that are associated with the rapidly increasing UAS technology that's out there and that we know is coming in the future.

MG Sean Gainey:

So in response to that Department of Defense directive, the Secretary of the Army stood up my organization, the Joint Counter Small UAS Office, and the chief of staff of the army and the second army designated myself as the two-star director within the army G-357.

MG Sean Gainey:

And the reason this is significant in my opinion, is because the army already had the responsibility for the integrated air missile defense. And that was at the time really being defined at the group three and larger area. So, by giving me the counter UAS mission set within the same organization of DAMO Fires in one hat and JC on another hat, you essentially take group one all the way through integrated air missile defense under one office as the synchronizer and integrator for the army, being that the joint counter-UAS side is a joint hat that are aware. But nevertheless, really gave the army the responsibility for all of it to really integrate plans, technology, training concepts, and doctrine, and to focus appropriate resources on countering the UAS threat while really minimizing what at the time the Secretary really wanted was to minimize the duplication and redundancy of all these pieces of equipment and find a way to bring them all together.

MG Sean Gainey:

So, one of the first things that I did after getting this job was really to take a holistic look at all the equipment that was out there specifically in the CENTCOM AOR and to see what was working well and how could we take this equipment and maximize the effectiveness of it.

MG Sean Gainey:

And so, after we did that, we really did a selection process, and we really came to an interim system of about 10 systems that we felt through our evaluation process were working well. And we wanted to develop a system of systems approach because of the missile defense background, one of the things I've learned over my several years in this area is unless you have a layered system of systems approach integrated in a common seat, you're going to have a difficult time detecting and identifying and defeating several ranges of threats operating in different modalities.

MG Sean Gainey:

So essentially what we did is we went through a common C2 system and worked to integrate those systems that we selected into that common C2 system. So then, focused the training so we can get the soldiers trained on it and then move forward that way to really get after this threat.

MG Sean Gainey:

And one of the things the Secretary of the Army did also from the acquisition side is he named the Army's Rapid Capabilities and Critical Technologies Office under Lieutenant General Thurgood to service my material acquisition lead that supports the JCO, which I thought was real critical because the Chief and the Secretary of Army saw the need for rapid development and rapid capability to be able to get this equipment out. And essentially I work on really three lines of effort.

MG Sean Gainey:

First line of effort, I highlighted the joint material solution. The second line of effort is the joint doctrine piece. And the third line of effort is the joint trainer pieces, which is equally as important as the material

side. Because we often want to shift to the material side and not really focus on the training and the doctrine aspect. But that's just as important. We found that out while employing this equipment in theater.

MG Sean Gainey:

And so as we continue to work on system development, so after we did that initial [inaudible 00:15:03], now we shifted our focus to not only the doctrine and training, but also to working with industry, to take those systems we have and fully mature them while also looking where can we replace those systems or add systems in our systems of systems approach to develop more enduring type systems.

MG Sean Gainey:

And so we also, what also realized we needed to do is also we needed to develop a strategy for the department. Because at the time we did not have a strategy and we didn't have joint requirements. So we took both of those tasks on, developed a strategy for DoD that was signed by the secretary a year ago and developed joint requirements for an entire joint course, which really framed our approach moving forward and allow us to, from a unified enterprise effort, get after this.

MG Sean Gainey:

We've also worked closely with the Army Fires Center of Excellence to establish a joint training and doctrine required and help them move to a joint county US academy that's going to stand up at Fort Sill in the FY24 timeframe.

MG Sean Gainey:

And so, from the material side, [inaudible 00:16:15] Thurgood and his RCCTO team essentially understood we had to push the capability forward, but also wanted to give industry the opportunity to show the latest and greatest capability out there and leverage what we have two times a year as a demonstration where we invite industry out to show us the latest and greatest technology areas that their effort that helps us get after some of our capability gaps. For example, last August timeframe, we focused on low collateral interceptors, ground-based aerial denial and handheld dismounts systems. Whereas in April of '22, our focus is going to be on high powered microwave technology, directed energy technology and counter US as a ...

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MG Sean Gainey:

Directed energy technology and counter U.S. as a service capability, to help us to continue to build on the capability we have, and get after the joint areas we have.

MG Sean Gainey:

And one of the things, I'll wrap up with this, and set us up for our questions, and allow the other panelists opportunity to talk here is, we understand that the growing threat's going to require us to look at ways to get after this threat, while reducing load on the operator. So, we're looking closely at how can we integrate artificial intelligence into our systems, and some of the machine learning aspects into this? And again, we're asking for industry, any help they can provide in that area, integrating that into our systems, because we know that's going to be a key component in helping our operators reduce that

burden and workload, and allow us to effectively manage some of the advanced threats, as we move forward. So that's all I have right now, Riki, and I look forward to questions and more discussion as we move through this.

Mr. Riki Ellison:

Yeah, Sean, that was awesome. I'd like just to follow up with you real quick, your systems as systems, you've really, it sounds like you're doing any sensor and any shooter in a command of control at this level. We have not been able to do it at a higher level, which is remarkable to do. Can you just talk to that a little bit, in terms of also command and control, because people are also interested in, how do you distinguish friendlies from non-friendlies, and that complexity of what you're doing with systems of systems, and the cost curve part of it? Because I think when you bring up electronic warfare, that cost is minimal to nothing, basically, to where you're at today, to use that. So give us a perspective on the cost of your intercepts, where you're going with this.

MG Sean Gainey:

Great questions, Riki, and I'll try to dissect both of them, one at a time. The first, the cost curve piece, what a lot of people don't realize is that there's a lot of great technology out there from the electronic warfare. When you're talking some of the smaller UAS's, your group ones that are out there that are being very effective. And all of the services have worked very hard and closely, to where we can jam the signals, or we can hijack the UAS's. So a lot of great efforts and low cost effort. But also, what a lot of people don't understand is, we have directed energy systems out there, right now, that are effectively engaging these UAS's.

MG Sean Gainey:

And again, we know we have a lot of work in front of us to continue to get after this advanced threat. And by no means, am I oversimplifying it. But the fact of the matter is that technology area of electronic warfare, directed energy, and some of the lower cost interceptors that I highlight, the low collateral interceptor, and some of the lower cost interceptors, like the Kodi interceptor, that's been very successful out there, are assisting us in the cost curve [inaudible 00:20:19]. Because, some of these larger UAS's, you have some countries shooting Patriot missiles, a couple million dollars, but, they're forced to, because they have to, to provide protection. But, as we look at this problem setting, if there's a way to effectively do it in our layered approach, and reduce the cost, whether it's through our C-RAM engagements, or our Cadio engagements, or EW type of engagements, obviously, that's where we want to be. Because the sheer amount of UAS, small UAS's that we're going to see, you'll never have enough larger interceptors to outshoot them.

MG Sean Gainey:

And, that's why, when I talk counter UAS, you just don't talk from a systems capability. You also have to look at this holistically, attack operations, passive measures, are all part of the calculus. When you look at, in your terms, cost curve, and trying to get after this threat.

MG Sean Gainey:

Remind me again of your other question.

Mr. Riki Ellison:

Any sense or any shoe. You're ahead of the army on this. You are ahead of everybody on this. So I just want to see where you're at, because that's where we want to go.

MG Sean Gainey:

And, I can talk forever in this area because as you know, I'm passionate about this, and I really love what I do. And, it's a beautiful thing when you're seeing, whether it's infantry soldier, field artillery soldier, a non air defense label soldier, sitting in front of a Ford area air defense, FAD-C2 box, helping manage airspace, to direct engagements that are detected by several different shooters, whether sensors, whether it was a curve sentinel, or any other type of radar or system. And then direct effects, whether it's a directed energy EW system or Kodi interceptor, is really an amazing thing.

MG Sean Gainey:

Now again, we have work to do to continue to bring that together. But inside of our base defense operations centers, our soldiers... And it's the soldiers on the ground, and it's the work of the leadership that are out there, that are all hands getting after this.

MG Sean Gainey:

And it's done from a joint perspective too. I've highlighted systems that all the services, whether it's Army, Navy or Air Force have done, but also the Air Force has leveraged some of their fighters to get after this threat, also. And so it's a joint effort, leveraging the county UAS systems we have, leveraging the air missile defense systems we have, and leveraging even some of the aircraft we have, to holistically get after this threat that's out there, to move this ball forward.

MG Sean Gainey:

But yes, the system of systems approach is what I took from the IBCS JAD-C2 concept, knowing that, even though it's a much smaller scale, and it's down to the base operator level, you still have to attack it from that perspective, to be able to get after this threat.

Mr. Riki Ellison:

That was great. Thank you, Sean. Going in that direction, in the joint direction, we're very honored and fortunate to have retired Lieutenant General John Ty Thomas with us. Ty is our Special Advisor, Integrated Air Missile Defense to NDAA. And Ty certainly understands base defense with the Air Force perspective. He was the head of operations in Europe for the European Air Force, and also out in the Pacific, Deputy Director for PAC-AF. So Ty, we look forward to your perspectives, coming in at this with Sean.

Lt Gen (Ret) Jon Thomas:

Okay, great. Thanks, Riki. And first of all, Sean, hey, thanks for taking time out of a busy day and joining us here for MDA virtual round table, because your contributions are key to this, both for the entire department, but as well as a broader community of everybody that's out there, that's listening, and is going to see the transcripts from this, as well. So, thanks.

Lt Gen (Ret) Jon Thomas:

Let me start out. And I think it'll add on a little bit to some of the last things you provided, Sean, in terms of your response to Riki's question. I think we all need to just look at this very simply, as this is an

integrated air missile defense problem. It is not a separate and distinct problem. It is, some of these effects that they could produce might be small scale, in terms of kinetics or non kinetics, but they could have strategic effects. I'll talk a little bit about that, and the threat that they represent, but it is, first and foremost, this is part of the integrated air missile defense problem set.

Lt Gen (Ret) Jon Thomas:

Just a little bit of a walk back on history lane, not too far, but to recognize and reinforce, the threat didn't just show up over the last couple years, when they started flying stuff over our bases in Iraq and Syria, but it's a... The Russians got their heads handed to them. If some of you remember back on December 31st, I think it was 2017, at Bosselasad Airfield, and they lost multiple aircraft to very primitive UAS systems. And they lost them because they weren't ready. They didn't anticipate the threat. They got put on their heels. And they had to figure it out.

Lt Gen (Ret) Jon Thomas:

Well, we haven't had that watershed moment, but ladies and gentlemen out there, we're not too far from it if we don't stay ahead. So the work that we're doing, and that General Gainey's leading, is absolutely critical to stay ahead of the threat. Kinetic threat, kinetic attack, like I just referred to as what happened to the Russians, not the only threat. As General Gainey mentioned, there's a lot of different things that these systems can be doing. Okay? They're observing. They may be acting as a communication relay. They may have some electronic warfare effecter on there, versus a kinetic one.

Lt Gen (Ret) Jon Thomas:

One of the biggest problems our commanders have, is you don't know. You don't know what's on that group one UAS, versus that group three, is it, what's hanging underneath that quad copter? Is it a camera or is it a grenade, like we saw up in Northern Iraq several times?

Lt Gen (Ret) Jon Thomas:

The other part, and this is where I think it's worth dwelling on a little bit, is that what we're seeing right now in CENTCOM, is a good portion of the potential for kinetic attack. And not necessarily happening every day, but that threat's there, but it's, CENTCOM is a little different in terms of the operating bases and the operating environment, but this is a daily competition threat. Riki, you mentioned my background in UCOM and INDOPACOM. And I'll tell you, before the deputy, or the director of operations Shava Usasfy, two assignments before that, I was the commander at Ramstein Air Base. This was a real problem in terms of, what exactly could I do as the Installation Commander at Ramstein Air Base, when a quad copter showed up over our large air mobility ramp, ramp five?

Lt Gen (Ret) Jon Thomas:

I think the commander there now, five years, six years later, has some options that I didn't have back in 2015 and 2016. And yet, that was a real problem that, and you take that and you multiply that across to all of our bases, our depots, that is something that we've got to put capabilities in the hands of commanders. Obviously in crisis and conflict, it's going to get even more intense, but I want to make sure that we're understanding this is daily competition as well, a threat that's out there.

Lt Gen (Ret) Jon Thomas:

You mentioned the cost curve, Riki, and I won't spend too much time on it, other than to reinforce Sean's point. Commanders are going to use the capabilities that they've got in their hands at the time. So, we've got a Tornado GR 4 Launch and a ASRAM, against a group two UAS, that commander, I believe, is doing it, because that the threat was at that garrison, and you need to engage it. What we hopefully do is give him a lot of other options, that he won't have to expend that round off of that air to air fighter that could probably use it for a different purpose on another day.

Lt Gen (Ret) Jon Thomas:

So, let me, I don't want to get too long here, and I want to make sure Tony's got a chance before we switch to questions, but I want to give a couple examples, also, to reinforce the point about daily competition. So, without going into too many operational details, so we had a pretty important and significant airlift movement in 2019 timeframe, that was moving through Europe, and moved through multiple different bases, both Allied and U.S. bases. And those movements, at one point, they were interrupted purely by the presence of a UAS. That UAS showed up over an airfield, or in the vicinity of an airfield, and the movement that we needed to make through there had to get canceled. And there's a couple reasons why. One, we didn't know what it was doing. Second, we didn't have all the authorities in place to be able to put an effect against that, should we have chosen to do so.

Lt Gen (Ret) Jon Thomas:

We subsequently acted pretty quickly and found the means and the mechanisms to do that. But, I pull that thread a little bit because, as important, and I think I'll refer to a question, probably, later on, that we got on the subject. Sean's comments about, it's not just the material, it's the doctrine, it's the training, but I would also say it's so critical that we have the authorities in place, so that when that installation commander or that field commander recognizes, identifies the threat, believes they need to engage it kinetically or non-kinetically, there's no question in their mind what they can or can't do.

Lt Gen (Ret) Jon Thomas:

That's a very difficult problem, considering the global presence that we have, and the fact that the Department of Defense doesn't set all the rules, particularly as we're talking about installations here in the United States. So that's a, I think, a really critical example that I would give.

Lt Gen (Ret) Jon Thomas:

The others are out in the INDOPACOM, and I'll give you two. One of them was just simply during an exercise, we are operating from a civilian air field, not a military installation. We're doing that by virtue of the pressing need to do dispersed operations. And yet again, we had a quad copter show up. And the question there is, is who had the authority to engage and when? And what systems did we have? At the time, I'll be quite frank, we didn't have an adequate set of systems in the hands of the commander. I think, quite frankly, we're better in CENTCOM than we are in INDOPACOM, based on the field of capabilities. We've got to catch up on that. But that particular question of, what we were able to do, it interrupted the exercise there.

Lt Gen (Ret) Jon Thomas:

And the other one is, it goes back to, this is an IAMD problem. So some of our higher level esoteric and exquisite capabilities, I'll use THAAD, for example, it's not going to require a cruise missile. It's not going to require a ballistic missile to make that THAAD not capable of its mission. It could be require, it could be something as simple as a group one through group three UAS. If we don't take that layered approach



to our high value assets, and consider the UAS threat, we're going to be in trouble. So, and we obviously, we've talked a great deal about defensive Guam. UAS defensive Guam is as important as ballistic missile and cruise missile defensive Guam. And we've got to make sure we include that in our discussion.

Lt Gen (Ret) Jon Thomas:

Let me wrap it up with this. And this is a quote from, I won't identify the source, but a very senior leader in the Pacific, and his quote was about UAS. "We cannot have a capability sitting in or on a vehicle, but not be able to use it." Meaning that, those that are supposed to employ it are properly trained. The system isn't fully certified or ready to go, or we don't have the authorities to be able to execute the engagement. That is the bottom line, is the ability for our commanders, our soldiers, sailors, and airmen to do something about the threat, and not just observe it. That's when we're winning in this discussion. And until we get there, we still have a lot of work to do.

Lt Gen (Ret) Jon Thomas:

Wrap it up there. Riki, turn it over to you. If you got anything, and then otherwise over to Tony.

Mr. Riki Ellison:

Yeah. And thank you, Ty. You've touched on a lot of points here. I'd like you just to think through a little bit and help us, because the capacity that has to be driven to do this in every base, you pointed out, that's massive. And not just the air bases, the ship bases, the Marines, and even the non-combatant logistics. So, is Sean's group the way to go forward? I think it is, right? But how do you really make that to be able to create the capability and capacity, that's the question. Do we want every one of our installations forward defended? We have to, I think. And then how is that? Where's the resources? Where are we going with that? How do we grow this thing out to make that happen?

Lt Gen (Ret) Jon Thomas:

Yeah. Thanks, Riki. On the capability side, I'll, maybe I'm being bold, but I'm not that concerned, because I'm very confident that teams like Sean's, as well as others that are there, he mentioned Coyote Raytheon's doing a great job with that system. Those capabilities are coming. The capacity, as you mentioned, is.

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Lt Gen (Ret) Jon Thomas:

... the capacity as you mentioned. So that's truly where it's going to be shown how serious we are about this, because getting to that capacity, Riki, is going to require us to make trades on other things. So are we willing to do less with... I don't know, I'll use an Air Force example... Buy a few less aircraft to make sure that our Air Force units... We have this discussion about roles and responsibility, but whoever, those Air Force field commanders that are at a small airfield in a second island chain or in the first island chain or somewhere in Eastern Europe, to make sure that they have sufficient capacity of the capability Sean's talking about, that's the hard waste that's going to have to be made. This is a really good session because we're helping to educate folks on the importance of where this fits in into our over integrated air and missile defense, and it's a hole in our swing right now.

Lt Gen (Ret) Jon Thomas:

Once senior commanders and resource allocators, so to speak... I'm talking about the capes of the world and DepSec [inaudible 00:35:01], and the SecF himself, they can make choices to make sure the capacity exists, but it's going to require some trades. And then the broader one, I'll go back to a little bit on the authorities piece only to say that that's going to require buy-in from others. Foreign governments, other departments inside the US government, and if they don't buy-in, they're still going to make our lives hard.

Lt Gen (Ret) Jon Thomas:

So the capacity, Riki, you've hit on it. We can have the greatest capabilities in the world, if they aren't resident at the right place, doesn't help us a bit.

Mr. Riki Ellison:

Thank you. Thank you, Todd. Our next guest is our board member, Anthony Manganiello. He is the co-founder of Striveworks, but he has recently come off of the Army Science board. He is a 20 year veteran in air defense as Lieutenant Colonel, West Point grad, but I think one of the most fascinating things that he's been doing is he's been in bases forward in the Middle East, working both AI and machine learning, to get ahead of the threat. And he's coming at it with a software approach, he's coming at it in that direction. So we really welcome you, Tony, the floor is yours.

Mr. Tony Manganiello:

Sure, thank you. Thank you, Riki, thanks, sir, thanks, Ty. Really appreciate, and humbled being here, to go ahead and not only be able to talk about this, but to be able to go ahead and help. And let me just give you just a little background here in a minute.

Mr. Riki Ellison:

Hey, Tony, can you [inaudible 00:36:35] move over, move over a little bit, because we got half of you. There you go.

Mr. Tony Manganiello:

You got half? How's that?

Mr. Riki Ellison:

We want all of you.

Mr. Tony Manganiello:

That's because I need to go on weight control program. So anyway, how about that? Is that better, buddy?

Mr. Riki Ellison:

We're all good. Okay, you're fine, go ahead.

Mr. Tony Manganiello:

I'm sitting at an airport now. I'm on my way to Joint Base Lewis-McChord to go and see the MDTF guys. So after my 21 years in service, I spent 20 years on Wall Street in a financial electronic trading

environment. I was fortunate to be there when we switched over from floor-based trading to electronic trading. And as we built that out, the reason why I bring it up is it went from just trading inside a building to trading exchanges all over the world. Hundreds of exchanges that you had to be connected to, tens of thousands of different financial instruments. That you had to ingest that data, you had to go to pick out the ones that you wanted to trade, analyze them, make a decision about it, and get it done in milliseconds to go ahead and beat out the other counterparty that was out there trading against you.

Mr. Tony Manganiello:

Now we did that, and we did that with 145 people and traded more than the major industry because we knew how to handle data. We were doing data science and machine learning way back when, in the beginning, to go and do that. The thing that I feel so proud about our military is that the senior leaders at the time recognized that. They came down, they came down to us and said, "Hey, can you help? We have a data problem. We have a data problem that we to go ahead and fix." And that took me out of my soft, cushy Wall Street world, and as Riki said, we put together a group of people and started going down into the CENTCOM AO and working problems.

Mr. Tony Manganiello:

And for me, the air defense problem was always near and close to my heart. As I see General Gainey's got that 11th ADA brigade patch up there, which is my combat patch that I wear as well. So what's the similarities? The similarities are the tremendous amount of data coming in, in terms of things that a flying around that you have to go ahead and start through. What's a friend, what's a foe, what's it got, what doesn't it have? You have to go ahead and ingest that, you have to analyze it, you have to be able to go ahead and make a decision about it and execute it, and even see how the trade was finished, meaning seeing what the BDA is. That whole cycle, that system of systems has to happen.

Mr. Tony Manganiello:

In our trading world, it's milliseconds. I'm not going to stop until we get our stuff down to milliseconds, because that's where we need to go ahead and be to go out and do that. Now one of the biggest problems that you get in the trading environment is you'll come in and you'll make your plan at seven or eight o'clock in the morning, and you find out that the trading day is never like the day that you planned. No plan survives first contact. So you have to go ahead and adapt and be variable, and the guy and gal whose able to go in and adapt their trading strategies, or their models, faster is the one who's going to get inside that decision cycle and win. It's the same thing here.

Mr. Tony Manganiello:

Let's look at the variability. In terms of tactics, the traders have strategies that they go ahead and run. In terms of tactics of UAS and other air and missile defense, there are new TTPs that they'll go ahead and execute, swarms. Or maybe they'll go ahead and have class one, class two, class three, they'll go ahead and combine them. They'll use it it with other methods. There's data.

Mr. Tony Manganiello:

The data that's coming into the trading environment, different financial instruments, different instruments every day that you have to go in and adapt and say, "Hey, I'm going to trade this piece versus this piece versus that piece, and make a new strategy." In our world now, in the military world, there's new ISRs that are coming out. Maybe you do acoustics, maybe you do electronic, maybe you

do... So you're going to have to be able to ingest that data quickly and change. You have to go ahead and adapt it, adapt to it. There's all different types of things.

Mr. Tony Manganiello:

There's speed, right? There's speed to execute, there's speed to execute on both sides, and the trade, and to go ahead and get it. Get inside that enemy decision cycle, get to the left of the launch. Sugar Ray Leonard was one of my favorite heroes, way back, Leonard when he is boxing all those guys in the fabulous four, because he was able to hit that guy before that guy can go ahead and throw a punch. Let's hit them before we can go ahead and do that, let's get out in front of it. Let's execute that trade before that other trader is able to go ahead and do that.

Mr. Tony Manganiello:

And then we get into cost, right? If it costs us too much money to go and trade in a particular exchange, it's not sustainable. We'd go out of business. And we talk about costs, and I agree, the commander has to use what a commander has available, but if we get into a long near-peer fight, we're going to exhaust our supplies rather quickly, and that cost is not going to work. So we need to continue to go ahead and add that into our analysis, in terms of how do we do that, how do we go ahead and put that together?

Mr. Tony Manganiello:

I taught math at West Point, a lot of it's all about math. Figure it out, a linear optimization problem or some machine learning models to go ahead and do that. But what we need is we don't need a static solution. We don't need one thing that's going to... There's no one ring that rules them all, there's not going to be one software package that rules the world. We need a capability to go ahead and be able to go ahead and change and adapt as the enemy changes and adapts, and as we get new equipment and new ISR and new things that are coming into the play, and new tactics techniques and procedures. So we need that.

Mr. Tony Manganiello:

We need the ability to go ahead and share that. So we find stuff... Americans always seems to fight two front wars. If we're looking at Indo-Pacific, we're looking at UCOM, why not share those solutions? But they have to be able to adapt the solution when they go ahead and get it, and then scale it out to the larger force. So we have to be able to go ahead and do that.

Mr. Tony Manganiello:

The thing that's happening now that I see, is happening through the sheer will and effort of the commanders and the soldiers, sailors, and Air Force personnel that are out there. They are putting stuff together and helping us out, only because of the quality of our American military. And I'm super, super proud of it, and was down range and thank God, protected by all of them. But what we need to go ahead and do, I think, is... And I'm hoping that the senior leadership in both our military and DOD and Congress give people like General Gainey and the commanders the ability to go ahead and build things that they can go in and adapt quickly. Give them that free. Let's not put them back into the old World War II acquisition system, because we will not be able to keep up with the threat.

Mr. Tony Manganiello:

The [inaudible 00:44:02] is the right way to go ahead and go. General Thurgood's doing a great job, but we need to go ahead and give, accept the... Give the commanders the risk, the risk to go ahead and do that. Our commanders are great, our soldiers are great, let's go ahead and give them the ability to go and do. Now I'll get off my soapbox and leave it. I can talk for hours about it, I'm sorry.

Mr. Riki Ellison:

Tony, that was great. Hey, great perspective on how important that time is and speed of decision making.

Mr. Riki Ellison:

I want give the floor back to Sean to comment on any of the discussions our two gentlemen have had, but also-

Mr. Tony Manganiello:

Can I add one more thing? I'm sorry I interrupted you, because I did forget one thing.

Mr. Riki Ellison:

Oh no, go ahead.

Mr. Tony Manganiello:

And it's great that General Gainey has got this mission, because the other... You hear the airport. The important thing is that it's all fires, right? All fires are coming together, maneuver and fires in a multi-domain fight. So Counter UAS, as Ty was saying, it's not a singular problem. When we shoot something down, it's got to fly through the air, so we've got to worry about aircraft and all those things, we got to worry about the maneuver force, we got to worry about everything that's up there.

Mr. Tony Manganiello:

So it's not an integrated in integrated air and missile defense, it's integrated in the multi-domain fight, which makes it even more complex. If that doesn't excite an engineer and a data scientist and a software developer out there to go in and come and help and work, I don't know what does, because we got the best problems in the world to go ahead and solve. Over, sorry.

Mr. Riki Ellison:

Okay, thanks Tony.

Mr. Riki Ellison:

Sean, if you want to respond to that, please do, but I also want to go back to the capacity problem. What is your defining point where we can now make the case for trades? Are we there yet, or how do we get there, or is there a milestone that we have to achieve to be able to make the case to get this done in capacity across the world, in what you do?

Mr. Tony Manganiello:

Okay.

Mr. Riki Ellison:

So you up to all that.

MG Sean Gainey:

The only point... I wrote down a few points, all great points and great discussion, and I think one of the most important points that was brought up was the authorities piece. And that, outside of some of our contingency areas, is an obstacle that we have to, through our policy effort, get around. Because we have obvious [inaudible 00:46:31] but the authorities piece is critical to this effort, and we put a lot of effort behind that.

MG Sean Gainey:

As far as the capacity piece, yeah, we fully understand the capacity. But Riki, I've been in this business with air and missile defense, so you're not going to be able to pin me down on exactly how much when it comes to capacity. But acknowledge all, and I tell you, each service... My role, in my JCO hat, is to develop the joint capabilities and work closely with the service to develop those joint capabilities, but it's the services in their Title 10 responsibility that are going to employ that capability. So I won't completely dodge the question, because I do have that aspect as part of my [inaudible 00:47:13] fires hat in the army side of how, when you talk capacity.

MG Sean Gainey:

And you're right, there's several hundred bases, installations, out there that we in DOD have responsibility for, and each service takes that seriously, and determine through their analysis on how much capability they will provide globally to get after this threat. But each service takes it very seriously, and has a plan to provide coverage accordingly.

Mr. Riki Ellison:

Thank you, Sean. I'll open it up for both of you gentlemen to ask Sean anything, and then we'll open up to the public.

Lt Gen (Ret) Jon Thomas:

Tony, go ahead if you've got something, and then I'll pick it up with the questions. We've gotten some good ones that come in.

Mr. Tony Manganiello:

No, no, I'm fine. I just want to thank you, General Gainey. I keep up with what you guys are doing and I think it's going great. I just, like you just said, I wish we can go ahead and give you the ability to go ahead and make changes quicker, and have the authority to go ahead and do that and give the commanders the same type of thing, to go ahead and get that stuff going. Let's break through this, because there's a lot of solutions out there in America. We got a lot of innovative people, and I know you're tapping into them, so just... But let's not go ahead and then say, "Okay, well, we'll give it to you three years from now," because we'll have probably 15 other types of UASs by the time you get it. Over.

Lt Gen (Ret) Jon Thomas:

Okay, great. Thanks, Tony.

Lt Gen (Ret) Jon Thomas:

All right, so I'm just going to go to questions because the first one, in different variations, we've gotten from three different viewers out there so it's a really good one. And Sean, I think you touched on the answer a bit in your comments, because the question is really about most recently the engagements that we've seen in CENTCOM have been kinetic engagements, but what is JCO doing, and the army in particular, with respect to non-kinetic directed energy in particular, systems and capabilities? One of the viewers out there mentioned the Marine Corps compact laser weapon system, but Thor is out there, that was an Air Force Research Lab developed system. Sean, can you talk on what you're doing with those in this April 22 demonstration that we talked about?

MG Sean Gainey:

Absolutely, absolutely, and I'll help you out with the combat CLAWS. We just call it CLAWS. You know how we are in military, quick acronyms that help so we don't have to work through the entire lexicon of it. But no, you're absolutely right. We have the CLAWS system and we have other DE system. And as you all know, just like integrated air and missile defense, we're, through RICTO, looking at directed energy options in the air and missile defense, and it only makes sense to utilize it in a counter small UAS fight.

MG Sean Gainey:

And we have systems right now out there, successful, providing success against this fight. Now the key is, as we operationally assess these systems, it's finding what's the right sweet spot for the kilowatt for these systems, and what are we going to look to field accordingly? So we have systems out there. Also, we have a pelletized version that we're testing in April, so a lot of effort going after. That's the directed energy side. We're also looking at high power microwave.

MG Sean Gainey:

Sir, you mentioned the Thor system by the Air Force, and there are other systems out there in the high powered microwave, and we're looking forward to see in our tests in April what we can achieve-

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MG Sean Gainey:

... in April. What we can achieve with the high-powered microwave technology, and what can we continue to achieve with the electronic warfare capability that we have that's non-kinetic. But I believe we always want to have that kinetic capability. And, again, I talked layer, system-of-systems approach. So, you're layering that capability out there. And if the non-kinetic stuff doesn't work, you have the luxury of providing a kinetic solution to the threat.

MG Sean Gainey:

So, a range of options that's being utilized out there. Everybody just tend to like to see the kinetic options, but there are several other options that are successful that we're developing and need to continue to develop, moving forward.

Mr. Riki Ellison:

Sean, can I just ask you the doctrine? So, you create these great systems with directed energy, but is the doctrine ahead of it? Is the doctrine near it? Or is the doctrine way behind it to be able to deploy these systems and fight with these systems in civilian areas, as well as military areas? Is there doctrine?

MG Sean Gainey:

And we're working through the civilian areas, but, as you know, we don't... the directed-energy stuff that we're leveraging are in contingency-type locations. And we're learning from it. And we're employing it in a learning fashion.

MG Sean Gainey:

Now, we've worked the authorities piece, the appropriate authorities piece, through the OSD to employ these systems under measures that we feel strongly that are safe in employment and will be focused on doing the mission we want it to do in that space. I hope that answers your question, but that's probably the best I can do with it [crosstalk 00:52:52].

Mr. Riki Ellison:

Obviously, it's a lot easier to use directed energy on a ship in the middle of the ocean than it is on land. And [inaudible 00:52:58] [TRADOC 00:52:59], and how you've changed that a little bit in the Army, and how that doctrine has got to go to the warfighter that's using these systems, how important that is. That's got to be a parallel path to what you're doing with the capabilities.

MG Sean Gainey:

And it is. And the teams across the services are doing excellent work. And I think Lieutenant General Thurgood and his team at RCCTO have done a good job of framing it for the Army on when you employ these directed-energy systems, the technology advancement of the safety mechanisms that are implemented in these systems help us get after being able to employ them in different type of settings. But you're right. We will continue to work closely with the doctrine in how to employ this in different type settings, where some may not be as comfortable with. Because when you're talking lasers out there, everybody has their vision of lasers and directed energy and what that could be, so I [crosstalk 00:53:59].

Mr. Riki Ellison:

But you're on the frontier, right? Sean, you're on the frontier where the conflict is, but this is going to be applied in a big civilian airport, I mean, wherever. So, you're going to have to work through that and get through the reality of how you do it, and explain it to the public on what a laser beam does if it misses the target or goes somewhere else. So, that's something. And then the safety of it and making sure we're in parallel to that.

MG Sean Gainey:

Right. Yeah. I agree.

Lt Gen (Ret) Jon Thomas:

Yeah. So, Riki, on the next question that we got out there from the audience, and it touches on the authorities and a little bit of what you're talking about, but a little different in the sense that I don't think the question is as oriented on directed-energy, laser-type engagement, so much as the ability to



use something as simple as like a Dronebuster, which is kind of a handheld electronic warfare weapon. But the viewer was stating that, not sure that the ability to actually employ these in the legal and regulatory frameworks that exist are keeping pace with the technologies. And I think that's an absolute great question. It touches on a little bit of the [inaudible 00:55:09] competition and defense, as General Gainey mentioned, of just simple installations and the hundreds of them that we have around the world.

Lt Gen (Ret) Jon Thomas:

I'll add a little bit before I pose the question to General Gainey and Tony, if you want to add it. But the FAA for airfields that the US is responsible for and has the ability to control, they have a directive, 130, and there's a actual checklist called the FAA 130 I checklist that installation commanders have to go through. It's kind of burdensome. And quite frankly, they have to go through it. It needs to go through their intermediate headquarters. Eventually go back to the service headquarters in the Pentagon. Somebody signs off on it there. And then, only then, do they have the authority to actually engage with a system like a Dronebuster. And I'll say that there was a time in PACAF, when all of our installation commanders didn't quite understand that that was their responsibility to do that. So, there's an element of service level education in field command saying, "You've got to get after this."

Lt Gen (Ret) Jon Thomas:

The question that I have for you, General Gainey is, is just like JCO has the responsibility for the three, you know, material, a doctrine, a training, is there a central kind of DOD bellybutton for who's working the authorities piece, both domestic and then internationally? Is there a central place for that? Over.

MG Sean Gainey:

Dang, you guys are good. You guys are good. That's a tough one. That's been one of the challenging efforts, just to be honest, moving forward.

MG Sean Gainey:

So, I am a doer. So, I energize my team, my policy team, to move forward and work closely with OSD policy and extend a direct outreach to the FAA to move along those authorities as fast as we can. And I know... and that was a great... whoever asked that question is spot-on, that there may be some frustration of, "Hey, I want more authorities to be able to employ some of the stuff, not only that's coming that I may have in some of these CONUS and even over overseas location."

MG Sean Gainey:

Yes. OSD policy has that responsibility, but we are working very closely with OSD policy, FAA, and even the NSC has taken a increased interest in this area and they are also getting involved in this area. And I think between the three of us, and working with FAA, we will be able to get there. But just as they view freedom of navigation as a priority, although we view the counter-UAS capability as a priority, I think we're going to be able to get there eventually. And that's something... you're spot-on. I guess that's about all I can say on that effort right now.

Mr. Tony Manganiello:

Hey, sir. My comment before was about authority to go ahead and give you guys the ability to go to get what you need to go ahead and do that. And then this was a different take on authority.

Mr. Tony Manganiello:

I want to take it another level. Way back when, when I took my Hawk battery to [Wiesbadenwe 00:58:22], we were seven-second flight time from the Czech border, where the Soviets, at the time, were going to come over. However, in order to go to even hook up our umbilicals to fire the missile, we had to get authority from the Air Force to go ahead and shoot them down. I'd venture to guess that it would've taken longer than seven seconds to go ahead and go all the way up the Army chain, over to the Air Force, and back down to my lieutenant to go to fire that missile. But we posed with the same problems tactically, in terms of that type of authority, you know, to go ahead and engage all the threats, actually. Over.

MG Sean Gainey:

I would tell you the CFAC has made significant advancements in that area to set our operators up for success. And I'll kind of leave it at that point. And there's a lot of great lessons learned in TTPs that are being shared with all the combatant commands based on what they're doing in theater right now.

Lt Gen (Ret) Jon Thomas:

Yeah. Having just been doing that job, Tony, what I would tell you is that our theater postures for our integrated air missile defense, whatever the threat is, they got readiness conditions. And as those readiness conditions go up, the ability of the firing units to engage becomes closer and closer to what you're asking for. And at REDCON-1, the units, they basically have the authorities they need to engage based on the tactical situation as they see it. So, it's taken a while since when you were bringing your Hawk [inaudible 00:59:58] over to where we're at today, but we've definitely moved the ball forward.

Lt Gen (Ret) Jon Thomas:

Just, Riki, we're kind of getting close to the end here. I don't know [crosstalk 01:00:07].

Mr. Riki Ellison:

Yeah. One more question.

Lt Gen (Ret) Jon Thomas:

Okay. One more question-

Mr. Riki Ellison:

Then we'll wrap it up.

Lt Gen (Ret) Jon Thomas:

It's one that may facilitate a fairly brief answer, but it's a really good, and we haven't touched on it. What are the key considerations that JCO is looking at for reducing the risk of collateral damage while the capabilities are employed for Counter-sUAS. Over.

MG Sean Gainey:

Yeah. I highlighted a little bit about that earlier. We're looking at things like low collateral interceptors that are out. There's a lot of great work by industry in that area to be able to either capture some of

these UASs, or have it take control, or have it land at a certain location, and doing what we need to do with it at our disposal, moving forward.

Mr. Riki Ellison:

Great. I think we should have a summary real quick. We'll end with Sean, and start with Ty, and go to Tony and Sean on our discussion.

Lt Gen (Ret) Jon Thomas:

Okay. Great. Thanks, Riki. Glad to be part of this, and glad to be part of MDA.

Lt Gen (Ret) Jon Thomas:

I think if there's a few big takeaways that I detected, one of them is that General Gainey and the JCO team are moving the ball forward and they're doing it in a rapid, but also coordinated fashion. And yes, the focus is on CENTCOM, legitimately so, in the sense that there are kinetic threats going against our forces there, but those capabilities and all the other associated parts with it does need to get out to the other combatant commands, and I see that happening.

Lt Gen (Ret) Jon Thomas:

The second big kind of observation I have is, is that there is still probably a lagging signal associated with the authorities associated with commanders. And it's just work to be done. Requires focus. And that gap, I think, needs to be identified. I could probably point to a few senior commanders that don't realize that their installation-level leaders don't have what they need in terms of authorities.

Lt Gen (Ret) Jon Thomas:

So, those are the two big takeaways. But great discussion, and glad to be here with you. Over to Tony.

Mr. Tony Manganiello:

Yeah, no, I agree with everything that you said, Ty. I mean, it's great work that's being done. I see it. I lived it over there. I saw it. And so, I really appreciate that and commend General Gainey and the RCCTO office for bringing that forward.

Mr. Tony Manganiello:

I just want to continue to work, and hoping to continue to work, to break down the barriers because there's a lot of solutions out there that we have here in America and also with our allies that we can go ahead and put together and not get tied up with bureaucratic acquisition-type things, to go ahead and put it in the hands of our military as quickly as possible because I think you guys are doing a great job in terms of coordination and getting the efforts done. Over.

MG Sean Gainey:

Okay. I'll just end it and say, again, thanks, Riki. I really appreciate you stepping outside and bringing this area to the forefront because I think it is important. We fully acknowledge we have a lot of work to do in this area, the work is only beginning, but we're trying to set up a path forward through our system-of-systems approach that can take technology as it's advanced and on-ramp it and plug it into our systems and eventually unplug older capability.

MG Sean Gainey:

We've just recently developed our on-ramp process. So, as the services find industry partners out there that are doing things differently and better to on-ramp them into our capability list. I'm excited about that. We just approved... I just approved that last week. So, I know industry has been beating up my team on how do you get that opportunity [inaudible 01:03:59]. That's the opportunity.

MG Sean Gainey:

And the last point I'll highlight to industry is, yeah, we have a lot of work to do, and I acknowledge that, and we look forward to working closely with you. If you feel that you're boxed out of the process by any way, please contact me personally. And I'll talk to anybody out there that wants to talk Counter-UAS that has a great idea about Counter-UAS because I want to hear from everybody because I'm sure there's great ideas out there that may not have been considered or may not be part of our demos. Bring it on. Lieutenant General Thurgood and I will listen to everybody. So, I'll leave that with you. Thank you.

Mr. Riki Ellison:

Hey, thank you, Sean. It's a great honor to have you on board here. But just the vision and the confidence that you've seen through this, that you're leading through this for the public to understand what we talked about today in the development and the deployment of these capabilities to go everywhere, to make the world a safer place and take that threat away, you're the lead. And it's just phenomenal. And I think what happened in the early last week to accentuate that and to highlight what you're doing is awesome. And I think we're going to be behind you, the Congress is going to be behind you, the administration's going to be behind you, and the American public and certainly the world public, to most extent, are behind what you're doing. So, you've got tremendous responsibility and great faith in you. So, thank you for your time and your service, sir.

Mr. Riki Ellison:

Thank you very much, ladies and gentlemen, for spending this past hour on this specific area of need and requirement for the world to make the world a safer place. Thank you.

MG Sean Gainey:

Thanks, Riki. Thanks, sir. Thanks, Tony. Have a good one.

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