

Operationally Responsive Space

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Col. Scott Klempner:

Okay, good morning, everybody. My name is Colonel Scott Klempner. I am the Deputy Program Executive Officer for Space Domain Awareness and Combat Power Systems out at Space Systems Command. You have shown up for the responsive space panel. This is the second time we have treated this subject here at the AFA Convention. The first time was on Monday in the classified session, and we can go into a little bit more detail behind the motivating threat, but all the basic concepts about responsive space are unclassified. I'm going to set the stage a little bit, and then we're going to dive into our industry panel here to talk more about some of the details.

So the other panelists this morning... Sorry, the other moderators this morning, I noticed have all marked that today is Valentine's Day, but it's actually there are two holidays being celebrated today. The other one, of course, is a 40-day period of fasting, prayer, and charity. It is a period of self-imposed deprivation. I am, of course, referring to the next round of continuing resolution. And it could be prayer is the only thing we haven't tried to get a budget. With that in mind, industry asked me several times this week, "What can we do to help?" And I always say, "Call your congressman." But I don't know if we're past that or not. Okay, back to the state setting.

In September of last year, the Space Safari team running VICTUS NOX program, it was a combined government and industry team, took delivery of a space vehicle and launch vehicle in under 12 months. That's nearly unheard of. They then called that space vehicle and launch vehicle up from storage into a ready phase that lasted for 60 hours. During that phase, the industry and government team had to generate a mission to get it ready for launch. They then had 24 hours to launch that space vehicle into an orbit that was adjacent to a simulated threat, which was actually a retired NASA satellite.

In that 24 hour period, they had to do things that normally took weeks or months to do, including things like flight safety, collision avoidance, range safety, FAA approvals. They were able to get all those things done because they had spent time preparing for how do we inject speed into this process. A launch processing campaign for reference can take anywhere from 45 to 90 days. They did it in three. The normal satellite acquisition time is between five and 10 years. They did it in one. Actually, less than one. Tactically Responsive Space is an operational concept that enables the space force to respond to adversary aggression at the speed of conflict. It is not about launch. It is not about the spacecraft. It's about acquisition, operations and mindset and culture.

We always say the adversary gets a vote. So when the adversary exercises that vote to control the time and place and nature of his action, the combatant commander wants a response option. When red moves his chess pieces on the board, he takes his turn then it becomes our turn. If we wait 24 to 36 months to respond, we are giving up our turn. We're skipping our turn and letting red have the run of the board. In contrast with the combatant commander has the ability to respond when those variables are known after the adversary acts, that gives the combatant commander the ability to counter operational surprise to blunt the first mover advantage.

Both of those contribute to the space force's theory of success. More importantly, the combatant commander can restore deterrence, disrupt an attack in progress, or even counter an attack after one has occurred. So above all, TacRS is a demand signal for speed. It's a demand signal to industry, but I think, more interestingly, it's a reflection that signal reflects back on the government. That's acquisition, workforce, operations crews, and even the federal civil bureaucracy that is involved in space... the putting things in space.

So breaking the record, smashing the record, which the VICTUS... sorry, the Space Safari team set two years prior, 21-day launch campaign, they smash that into a 84-hour launch campaign. It's fun to get a trophy, but they can't hand that trophy to General Whiting and say, "Here, go fight a war with this." It doesn't mean anything. What really he cares about is a repeatable, reliable operational process that he can use to generate combat power and space when it's needed. So that's the what and the why. We're going to talk a little bit about the how with our industry panel because it's a hard problem. Solving hard problems is interesting.

I hope that's interesting to you, and we're going to get your insights. So let me introduce our panel members today, and I'm going to run through, then I'll do an opening statement for everybody. So to my left is Jason Kim, CEO of Millennium Space Systems. To his left is Johnathon Caldwell, Vice President and General Manager for National Security Space at Lockheed Martin. And to his left is Jim Reynolds, Vice President of Defense Space at SAIC. Each one has at least 25 years plus of experience developing and fielding space capability. So a very distinguished panel, and I'm looking forward to hearing you getting the benefit of your experience. So at this point, I'm going to hand it over to Jason for opening remarks.

Jason Kim:

Thanks, Colonel, and thanks to AFA for having us on. It's a privilege to be here with you today on Valentine's Day, and because Millennium loves everybody in this room that also loves air and space just like we do, we have a short video we want to show you. If that doesn't get you excited, I don't know what will. Certainly gets me excited. And talking about VICTUS NOX is also exciting. At Millennium Space Systems, we're rooted in national security space, and we're an end-to-end prime contractor delivering smallsat constellations and low earth orbit, medium earth orbit, and geosynchronous orbit.

And we were... we're known for fast timelines. We've delivered our Rapid Pathfinder program spacecraft back in 2011 in 24 months back then that was really quick. And then, in 2019, we delivered our Space Force Tetra-1 vehicle in 13 months. And so we further broke our own record. And then, on VICTUS NOX, we were the prime contractor, space vehicle provider, and ground mission operations contractor. And VICTUS NOX was even fast for Millennium. We delivered in under 12 months the space vehicle ready to get activated. And then, we broke all the activation records and the launch readiness records as well as the on-orbit checkout records. And how did we do that? Well, certainly, it helped that we're vertically integrated.

About 80% of our modular open system architecture components make up each one of our space vehicles. And if we build it, we know how to modify it really quickly. But we took a vehicle off of an active hot production line, and that's something that was new for us. And taking a vehicle from GEO to LEO, that's something I'll talk more about in terms of the lessons learned there. We also handpicked a very knowledgeable team of Millennium members that challenge the status quo, and that really matches well with our culture. And then, we also had a great partnership with Space Safari and Firefly.

So it really ends... I mean, it really starts and ends with our people, the people of Millennium, the 900 people that were contributing to this mission, the 700-plus people from Firefly that also contributed to the mission. And then the really lean and means Space Safari team and aerospace team that made all this happen from pre-acquisition to acquisition to launch and operations. And then all of you Guardians out there, Airmen and Guardians, y'all are what made this happen. Y'all are the secret sauce.

Johnathon Caldwell:

All right. Colonel, thank you and good morning everyone, and thank you to AFA for hosting, now for the second time, a critical topic like Tactically Responsive Space. I think it's a mark of how far we've come that this topic would get this kind of airtime both in a classified and unclassified setting. So at Lockheed

Martin, we've taken the historical stove-pipes around national security space and broken them down, and we've brought together the historical defense and intelligence space and forge them into a new organization.

And that organization is in service of a larger goal that we call 21st Century Security, which is about bringing connectivity and interoperability across all of the platforms that we have at our disposal so that the warfighter can be prepared to deter and defeat a determined adversary at the time of need. So, Colonel, I think one of the important things that you mentioned, Tactically Responsive Space is about a mindset. At Lockheed Martin, we believe, fundamentally, that it drives a different way of thinking. If you're going to be responsive, that implies speed.

It implies speed, not just of Lockheed Martin, probably speed of industry. It entails building partnerships. So we take advantage of the creativity and innovation of the entire defense ecosystem. One of the things that struck me about the CSO's opening remarks yesterday is the size of the Space Force, 14,000 Guardians. How do we, as industry, enable every Guardian to be at their peak, to not be doing the mundane workloads, but to be able to be focused on getting after the fight? Well, that means you've got to be responsive, and you've got to bring creative ideas. You have to automate.

You have to do things differently. You have to break the old paradigms. Tactically Responsive Space helps drive that new way of thinking. Tactically Responsive Space doesn't mean launch and spend the year integrating and calibrating and bringing inhibition. It's got to change our paradigm to plug and play. That means we need to agree on standards. As a collective industry and government, we need to say, "What are those standards that will let me go from launch to data to the warfighter in a tactically relevant timeline?" And VICTUS NOX an amazing mission. Last December, we launched a mission called Tantrum.

Again, pulling something off of a production line, integrating a wideband, electronically steerable array payload, launching it. I think we did it 54 hours. So we're working. We got to still have to ship from Colorado to Vandenberg. Getting it up... Getting it operational in three days. And for those of you who worked with the electromagnetic spectrum collection side of space, calibrating and bringing-mission relevant data on that kind of system in three days is pretty good.

We spent the last month running over a hundred different collects, getting data available to interested parties to demonstrate that it's not just a calm mission that you can do on an accelerated timeline, but it is sensing the environment around you in a tactically relevant way and making that data available for decision-makers. Couldn't have done that if we didn't have partnerships with Firefly, with partners like Terran Orbital and a wide variety of folks who are interested in doing things at speed and relevance. And we're going to see that theme repeated, over and over again, as we have this discussion today. And I look forward to the rest of this discussion.

Jim Reynolds:

Thank you. Yeah, thank you again to the AFA as well. Thank you, Colonel Klempner, for moderating the panel. It's an honor to be here with Jason, Johnathon. Really honored to be here representing SAIC. Just a little bit about my background. First, I am a proud 26-year veteran of the United States Air Force. I did work primarily in development, acquisition, operations, and sustainment of space systems with the National Reconnaissance Office headquarters Air Force, and with Air Force Space Command. I started and finished my career at Space and Missile System Center.

And my last assignment was working in a predecessor organization to what Colonel Klempner and Colonel Guetlein are currently leading and worked a lot of the or initiated a lot of the capabilities and the programs that I think now would be considered tactically responsive capabilities needed to get after this growing threat. And now, I'm at SAIC and get to work every day with an expert set of subject matter

experts across the entire space domain, creating, developing, and implementing mission integration solutions to rapidly integrate types of capabilities.

And VICTUS NOX is a great example of where SAIC contributed mission engineering systems engineering integration support services to the Space Safari office, both from a development of the concept all the way through to getting the approvals, the policy approvals, et cetera, the launch certification, the mission risk assessment analysis through to on-orbit checkout initialization and integration into operations. So really an end-to-end ability to provide that type of mission integration support that's so vital to these types of missions. But really, to everything we're trying to do in the Space Force. You see that in different categories of work, right.

We do a lot of engineering services work, mission services. We also do some system modernization work on some maintenance and sustainment efforts. We just recently started the ground-based radar maintenance and sustainment effort, bringing... I see Colonel West out there pumping his hand, bringing forward, modernizing these legacy systems that are vital to the space domain awareness to the missile warning missile defense missions that our Space Forces is assigned and bringing that forward even into more of a mission delivery capability as well with the space development agencies, BMC3 application factory.

How you can really establish a foundation that enables rapid mission integration from contributions from large companies or small companies or commercial providers where they don't have to bring the burden of the entire infrastructure to be able to deliver those capabilities into mission. So that's really the mission integration solutions that I'm proud to be working on, and we'll talk more about during this panel. Thank you.

Col. Scott Klempner:

Great. Okay, so I have questions for each one of you targeted at your specific situations. Then we're going to do a kind of a toss-up lightning round, and then that should bring us through the rest of the panel. So Jason, Millennium just got done with kind of this grueling acquisition to deliver the VICTUS NOX mission. So what went right, what went wrong? What lessons has Millennium learned from that?

Jason Kim:

Well, VICTUS NOX was all about learning from expected and unexpected and that's why it was a real trailblazer. Expected, you saw the results. But unexpected, what we learned is you need to have backups and contingencies. No matter how many times we rehearsed. And we worked closely with Firefly on launch rehearsals, even activation rehearsals. We still ran into Murphy's Law and things like if you have any consumables that you need for closeouts on the space vehicle, well make sure you carry backups because we had one of our consumables epoxy, it was punctured on route, and that's a setback, but we had plans to have someone restock that, a trail car to restock that. So the things like that happen, launch, fueling, fueling of the space vehicle in particular, I knew that was going to be a sticking point. And so we expected that, and we had a large prime contractor that was on call.

We had an on-base contractor that was on call, and we had a small business that was on call, and we hedged our risk. One of those was going to help us succeed. And what was unexpected was the small business was the one that ended up helping us complete those timelines. So that was unexpected, but we had the contingency in place. And then there's things like natural acts, right. So there was lightning during our launch readiness campaign, and that doesn't mean you get to stop. And so what are things that you do in parallel to the stop work on the launch side with the space vehicle to continue progress even when you have four hours of lightning stand down? So that's something that's kind of unexpected,

but you can plan for by doing simultaneous measures. And then just the 24/7 on-call support and having three shifts, I commend all the air and space, the Airmen and Guardians that have to do that for a living.

It's not easy on your people. That's something that we had to get in place because we got the call-up at any time. And in fact, I would say that we got the call-up during our monthly barbecue, and so that was unexpected. So those are kind of the things that we learned from this VICTUS NOX mission. And because we did it, we know we can do it again as a nation, but I think, at Millennium, we know we can do it faster. The on-orbit checkout of the space vehicle is 37 hours ahead of the 48 hours, that was a goal. We think we could do it much faster than that, you know, cut that timeline in half, and it has to do with the software findability and the flexibility of our spacecraft that enable that. So those are things that we learned.

Col. Scott Klempner:

Just for reference, on-orbit checkout can take anywhere from two to 12 months, so 37 hours is pretty darn good. Okay. So Lockheed is known for its systems engineering, the development discipline, developing large exquisite capabilities that work. Lockheed has a reputation for delivering a certain segment as one of the large primes.

So I'm really interested in hearing, Lockheed... sorry, Johnathon, you had your... Lockheed had its own VICTUS NOX-type mission. It had its own TacRS mission. In fact, Firefly even called it a TacRS-like mission. I'm interested in hearing what Lockheed learned from that and where Lockheed as a corporation sees that mission relative to Lockheed's kind of core businesses.

Johnathon Caldwell:

It's a great question. So even this last week, I had the privilege under one roof of walking a set of satellite production lines that go from the large core missions that are never fail missions down through the mid-class missions where we're getting to explore and try new and different ways of getting after the new ways of seeing space as a combat arena down to our smallsat production line, now, which has a backlog of more than a hundred smallsats across a variety of mission sats for the DOD and for the IC. And it struck me that that probably is a different picture than many of you may have in your minds.

I don't think we would've run the tantrum mission if we didn't have a hot production line of smallsats. In fact, we took the SDA Tranche 0 bus, and we didn't just produce them for SDA. We produced them for ourselves because we've come to understand that to be responsive means that you have to invest in technology ahead of time. You have to show that those foundational building blocks are there and ready. You have to practice. You have to drive yourself. Irregardless of somebody sending you an RFP, you've got to show that you've got the capability.

And so our personal investment as a corporation, together with our partners, like Terran Orbital and others, to challenge ourselves to replicate Tactically Responsive Space timelines for our own insight and understanding was great. It allowed us to bring innovative startup culture, and it led us bring people steeped in deep mission knowledge. If you think about the type of payload I described, there is a legacy and a wealth of knowledge of how to use those payloads. But you mash those two teams together, and you say, "Hey, there's no boundaries here. Get after it." And so we also had the opportunity to fly in very low-Earth orbit, as some of you may have seen.

And that required a tempo and adaptability of flexibility to get mission-relevant data on a timeline because there was a very firm timeline of how long we would have with Tantrum. Now you say, "Are those lessons learned?" I would argue they're not lessons learned until you turn around and put them into action. And so this, today, in fact, we announced our next self-funded demo mission in the Tactically Responsive Space arena called Pony Express 2, where we will launch and fly two CubeSats that will form

a tactical mesh network that will demonstrate a handful of interesting new technologies that we've been investing in through our ventures fund. It'll demonstrate things like open standard mesh networking.

It will combine bid and auction, which I think most of you come to know, we rely on bid and auction in our every day. But it's amazing to me that many of our warfighting systems still rely on manual connections. "I need a mission done. When are you going to do it? What satellite are you going to use? Where's the data going to go? When can I see it?" Let's simplify all that and use a system like HiveStar to say, "Here's what I need." Let the system figure out how to go get the data you need and let the data find its own way back to you in a time that you establish as being relevant to you. That's what the warfighter needs. It'll also demonstrate things like SmartSat, where anybody can plug and play their software into that satellite.

That's that open standards piece I'm talking about. What if we need to flex the mission? Okay, there are Guardians who write code now. Let them write that code. Let them load it to the vehicle in a couple of hours, and let's change the mission and get after something new. And so we're going to take the learning from Tantrum, and we're going to plow it back into a mission like Pony Express 2. And then, because we funded it on our own nickel, we're going to make it available to all of you to see is there something creative you can do. How can we connect? How can we do something better? And so I'm excited about putting lessons back in and making them applied lessons.

Col. Scott Klempner:

Great. So leaning in, would you say?

Johnathon Caldwell:

A little bit.

Col. Scott Klempner:

Okay. All right. So great. Jim, SCIC perspective is more closely aligned to the governments, but still not the government. There's still a degree of independence. Can you comment on what you would advise the government or what are blind spots that we need to be aware of when we are pursuing this mission even further?

Jim Reynolds:

Sure. Thanks Colonel Klempner. So I think there's really three things that have to go into assessing where you put your priorities from a tactically responsive solution. First, there's a collaboration that has to occur between government and industry in the right protected digital environment to assess the problem. Really the kill chain or the kill web analysis. Right now, we do that in pockets.

How do we stitch that together so that you can create that collaborative environment that allows not only the system acquirers but then the operators, the folks that are going to need to test and train and identify and quantify what those gaps are that you need to provide tactically responsive solutions for? The second priority is establishing an interconnected battle space. And I think that's largely the DAF battle network, the C3BM, a lot of those activities to kind of interconnect not only the space capabilities but your all domain capabilities to the joint warfighter. You have to establish that foundation so that your tactically responsive capabilities are just delivering into that.

And that brings me to the last priority, and that's having that kind of software or mission factory environment so that you don't have to create that every time you need to augment a capability or

create a new capability or take on a threat that's emerging or to protect and defend our capabilities or even deny our enemies their capabilities. So I really think those are the three elements to successful Tactical Responsive Space mission integration on relevant timelines.

Col. Scott Klempner:

Okay. All right. So I'm looking at the time. I think we have time for probably three more questions, realistically. So we went through the good. Let's talk about the bad. So this is a toss-up lightning round question before we get to the ugly. The obstacles that exist today in industry that will prevent us from being successful for future responsive missions really kind of weigh heavily in our minds. And I just wanted to hear your perspectives on what those obstacles might be and what we can do about them. Really open floor here.

Jason Kim:

I can start and then hand off. I think, in terms of some of the challenges, I'll use that word instead, that were very difficult on VICTUS NOX was you don't get a pass. You still need the system to work on orbit because if we're in a wartime scenario, you have to ensure success, mission success. So things like mission assurance, this was a Class C smallsat. We took the vehicle off the hot production line. We still had to go through the same systems engineering rigor and programmatic rigor and mission assurance rigor to ensure that this thing would do its mission in the end, so you don't get a pass there. That's very challenging.

The second thing is just security and cybersecurity, you do not get a pass there. In fact, it's even more important for these high-stakes critical missions that you get that right. And so that's a really long poll in this whole schedule. And the way you mitigate that is you just start early, and you work it often. And it's not just an industry thing. It's both industry and government. I saw the Space Safari help, in so many ways, break the traditional processes and timelines on the government side. And you can imagine anybody that has to deal with cybersecurity on a daily basis like we do, you can kind of feel that challenge in your veins.

But we were able to get it all done in the timelines, and those are two areas that I think are very challenging. And then the third area that was really, really tough was on orbit. We have very autonomous ground systems, lights out ground systems. But what we showed on VICTUS NOX was a little bit of our commitment at Millennium towards on-orbit autonomy. So the spacecraft does a lot of routine autonomous things on its own so that the Guardians can spend more of their time on decision-making and rapid courses of action planning.

And so the tough challenge was, this is the first time that I saw the Guardians, both enlisted and officers, use critical thought and use this warfighting mindset of, "Hey, if we're in a war, we're going to act differently. We're not going to do every single checklist item on this checklist. We're going to rely on our decision-making and be co-located with industry and get all the data to make really sound decisions quicker." And that requires a lot of change in mindset like we talked about earlier.

Johnathon Caldwell:

Yeah, I think I've seen more opportunities than challenges I think. We're pivoting away from, I'll say, that traditional mindset of take a long time to calibrate, take a long time to think about how you integrate. So this idea of radical commitment to standards and everyone coming to the table, both large and small, as we start to form some of these enduring standards bodies so that we can create an ecosystem where everybody's, whether it's software or a satellite, that that system can come and plug and play entails a

mindset of moving away from dictating the how to dictating the what you need. What outcome do you need? And that takes a change.

It requires building trust in the underlying technology. I think we need to continue a really healthy dialogue about understanding things like artificial intelligence. So when we field AI on a platform like Pony Express 2, to your point, do the Guardians have confidence in the fact that the system will take care of itself appropriately? Do they know what their role in operator on the loop really means? Do we know that we can get true warfighting effect out of the payload, and have we had a chance to practice that?

One of the things the CSO has pounded is we need to really focus on test and training and we need the entire spectrum of test and training from the digital simulators and those digital twin environments that we're all helping to create. But we all need to get really practical about providing you the tools to practice even in orbit on what it will look like because it's not good enough on the worst day to say, "I ran it in the sim." You want to know that you've rehearsed and trained as a team, that you understand how the system is expected to react and you know and have confidence as an integrated team that you can get after the fight. And so I think those are some thoughts I'd offer.

Jim Reynolds:

Okay. One challenge I just wanted to call out, in addition to the ones that Jason and Johnathon have mentioned, it's kind of a longstanding challenge to establish the right requirements budget and then contractual relationships to actually deliver integrated mission capabilities. Especially now as we migrate to more resilient, proliferated architectures that involve multiple components or multiple systems. How do you set up the relationship between government and industry?

And this is not just for the system delivery but all the way through to the operational support, sustainment, testing, training aspects that go into mission operations and integrating capabilities into mission operations. The current contractual relationships tend to be more service-based with systems engineering integration services or development and delivery of specific components. There's not a lot of contractual relationships or requirements or budget associated with the integration of end-to-end mission capability. And I think that would be one challenge that needs to be continually addressed.

Col. Scott Klempner:

That's a big one. Okay. I really wanted to ask my ugly question. It was about mission assurance for blue-on-red engagements when you only paid for a Class C mission. But I'm going to skip it in the interest of time. What I'd like to finish off the panel with is just kind of your thoughts about what aren't we doing in terms of mindset. What advice would you give to the government? What should we be... What's the most consequential thing that we could do next to advance our ability to develop a operational responsive mission in terms of a TacRS capability that we can do repeatably, reliably, and into the future to respond to threats? Let's start with Jason again.

Jason Kim:

So I think there's a lot to take credit for from Space Safari. So my hat's off to your team, Colonel. I think the area that we're seeing in the market is there's a lot of launch providers out there, and they're standing up production lines. So that seems to be growing and becoming more stable and predictable. And as Johnathon shared and I shared, we have active production lines of smallsats as well. So that's becoming stable and predictable and reliable as well.

But the area that I see that is not being attacked right now and should be for Tactically Responsive Space to become more enduring for prompt capabilities on orbit is a very robust payload production program.

And I would say if we could get more businesses and industry and government looking at that problem and funding that like Johnathon did on Tantrum and what they'll do on Pony Express 2 and what Millennium did on VICTUS NOX and continues to do on other programs, we can now have other options to put plug and play mix and max payloads that are technically responsive space on our production lines onto the launch vehicle and get those new capabilities on or to stay ahead of the threats.

Johnathon Caldwell:

So I agree with everything Jason said, and I think I'd add the more that government can invite us into the tabletop exercises, the space flag exercises as industries so that we're level set on what are those core capabilities that the Tactically Responsive Space mission sat will really entail. So we're not trying to boil the ocean on TacRS, but we have a very focused understanding of what the commanders will need, what tools in their toolkit.

And then we can talk about how do we set up those payload production lines because it isn't just about the buses and if we have a production line set up to get after comm, but really we're going to need ISR collection. Well, ISR payloads don't materialize overnight. So we do need to talk about what is kind of a threshold ISR capability that would be tactically responsive. I do think we need to work harder with some of the organizations like DISA to talk about how is that data really going to make it to the warfighter.

Do we have the network connectivity? Do we understand the permissions that people will need to see the data? And then, more and more, from a national security space standpoint, I realize that we're going to have to have a lot of blending of Title 10 and Title 50. So the question is how will we bring the totality of national security space into this tactically responsive arena and establish the agreements and the relationships, and how does industry understand those so we can best present options to the entirety of the national security space organizations?

Jim Reynolds:

Quickly adding to that, I know we're getting short on time here, but continuing to focus on taking of available commercial mission IT solutions, not having to develop that ourselves, bringing that to bear is going to really enable the unity of effort that I think really is needed to drive this culture change.

Just to circle back to the beginning, when Colonel Klempner was talking about this is really a culture change. And when I hear General Saltzman and General Guetlein talk about culture change, unity of effort, and that extends to the entire community that's working to... at this challenge. How do we create that collaborative environment that allows for protection of information at the right access levels from a classification perspective, but also from a proprietary perspective so that industry partners can feel free to operate in that collaborative environment without losing any of their intellectual property or competitive advantage? So that's something I think should be continued to work on.

Col. Scott Klempner:

Okay, great. So last word message to our panelists up here and our industry partners in the audience. Very proud of you, industry Guardians contributing to our national security. We really cannot do any of what we do without the products, services, capabilities that you provide to the joint force. I would say if you are in the audience and you're a member of industry, and you have a contract with my organization, SZ, tell your program manager that in addition to bringing operators into the program office and into the factory, that you are invited by me to ask your weight onto the ops floor and into exercises.

And I have space for space up on the front row, and I'm getting vertical head nods that this is a relatively new idea from my perspective. I don't think it's brand new, but we are definitely open to that, and I

think there's value there. Gentlemen, thank you very much for your time today. Thank you, audience, for attending. I hope you got a lot out of it. I know I did. Thank you for insights, and thank you to AFA. Take care.

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