



## A Fireside Chat with Col. Raj Agrawal

March 5, 2024

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Welcome to Air & Space Warfighters in Action. I'm Doug Raaberg, Executive Vice President of your Air & Space Forces Association. Thank you to everyone joining us online today as we talk with a Space Force's expert on space domain awareness. Now, Space Delta 2 is one of the most geographically dispersed deltas in the United States Space Force, operating 14 weapon systems to exploit opportunities and mitigate vulnerabilities in national security space. Now, AFA Warfighters in Action is made possible thanks to the generous support of our sponsors listed on the screen. We're very grateful for their continued support. Space Delta 2 commander Col. Raj Agrawal is with us now in our studio. Raj, thanks for joining us.

**Col. Raj Agrawal:**

Thank you. Thanks for having me, sir.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Glad to have you. We got a lot to talk about.

**Col. Raj Agrawal:**

All right.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So let's get going. This has been a busy space week already. Sunday, we saw the launch of four astronauts, three U.S., one Russian, onto the International Space Station. Good to see that they're safely on board. And then yesterday, at 2:05 Pacific Standard Time, we saw the Transporter-10 launch, a Falcon 9 heavy launch, both Sunday and on Monday. On board, the Transporter-10 was about 53 satellites including space situational awareness capability. So let me just start with, help our audience. What is space situational awareness?

**Col. Raj Agrawal:**

No, that's a good question. And we have dealt with needing to know what's in the space environment for a long time. The extension of national power into the space domain started on the Eisenhower administration. So the idea of using space for national security, using space for military objectives is not new. And it didn't start with the Space Force and it really didn't... It started well before much of the space apparatus in the U.S. Air Force started. And so you and I were talking earlier about some of your own childhood memories involved with space, and space has been fundamental to who we are as Americans, and it's been a fundamental part of how we project national prestige and national power.

So space situational awareness fundamentally is just knowledge of what's in the space domain. And the space domain, it doesn't just necessarily going to infinity, it begins in what orbits the earth. So we have a few different regimes that orbit the earth that we put satellites into. Those are the easy parts.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Kind of the low earth orbit.



**Col. Raj Agrawal:**

Yeah. There's low earth orbit. In fact, some of those orbits you can actually see with the binoculars are telescope. And then some of them go all the way out to geosynchronous orbit. And then we've looked into and what's become really of interest lately as things go into the moon and around the moon and different strategic points in space relative to the moon than the earth. But knowledge of the domain. And that extends, just like you're talking about, safety of astronauts. It's one of our primary missions day-to-day is to protect safety of human spaceflight. And we do that not just for Americans, but for any humans that go into orbit in space and certainly to the moon.

But what's more important is holding all nations accountable to international norms. So awareness of what's in the domains and what's in the orbits rather is what we do every day. And it has strategic consequences. One of General Saltzman's big priorities is competitive endurance for us. And the two things we're focused on from a military perspective, there's three really, but the first two that I'm really focused on is avoiding operational surprise and preventing or avoiding first mover advantage.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Understood.

**Col. Raj Agrawal:**

So when we talk about space situational awareness and the military application of that, I move into this thing called space domain awareness. And that's what you were talking about earlier. And our Delta's focus is turning that knowledge into understanding. And that involves intel professionals. It involves a number of other inputs besides just space situational awareness. But space situational awareness is the first step, knowledge, and then translates into a military application, that is understanding. We'll talk more about that I'm sure, but that's a little bit of what we do.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

No, I think that's terrific. In fact, I want to congratulate the U.S. Space Force for both launches on the East Coast and the West Coast in those two days, as well as NASA and SpaceX. But again, we're putting a lot into space in a contested and congested environment now. So really, how does Space Delta 2, how does the Delta 2 monitor all that and be able to provide the warfighters that situational awareness they need?

**Col. Raj Agrawal:**

So Space Delta 2 does not by ourselves monitor all of it.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Okay.

**Col. Raj Agrawal:**

Truth is, is that we have a number of exquisite sensors that belong to our Delta. And we get feeds from other Deltas. We have other Deltas such as Delta 9 that operates a space-based system. We have incoming capability that we're partnering with Japan soon on a space-based capability. The Australians have sensors. And I think most importantly, commercial provides quite a bit of capability to us. We take all of that input, space situational awareness, and we translate that into a military application of knowledge, again, to avoid operational surprise and to deny first mover advantage.



Those two, fundamentally, were focused on a Delta 2. And that goes into translating all of this into exploiting options. And when I came into command, I didn't come from a traditional space background. I came from a lot of joint experiences. And I treated this as a, hey, this is a military service. And so we have military requirements. We're part of a joint force. And our job is to integrate not just our international partners and commercial and academic and civil. We do all of that to create an understanding of the domain. But also, where are opportunities to exploit from a service perspective, U.S. Space Force, but then also from a joint perspective, because we have joint requirements all around the world that depend on space to optimize what they do.

Everything from precision guided munitions, to long haul SATCOM, to being able to provide critical tactical intelligence. All that depends on space. All of that provides capability to the terrestrial forces. And I think most importantly, I think where some of our competitors live is they understand that if you take that away, you take away fundamentally our capability to project power as a nation, not just in the military, but information, diplomacy, economics, all of it's dependent on space.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

What I get from that too is that you're not only just a force provider, organized training and equipping force capability, but you are literally in the fight each and every day for the combatant commanders, meaning there are requirements.

**Col. Raj Agrawal:**

Yeah. I mean that's important distinction that combatant commanders have requirements. The services are the ones that do the war fighting.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Right.

**Col. Raj Agrawal:**

And so our objective is to present combat ready forces that can meet combatant commander requirements. But we train as warfighters, we are the warfighters. On a daily basis, I have very high expectations of my operators, both Guardians and Airmen, that have to integrate into the joint fight, understand what the various combatant commanders require, and are thinking about those outcomes and not simply about what's happening in their op centers wherever they are around the world.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

I'm probably making this a little too simple, but a lot of people think of, you're tracking space junk and debris. That's not what you're doing. What you're really doing is you're sifting through that for that coherent change detection in space.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Imagine something changing that you have to make a commander aware of.

**Col. Raj Agrawal:**



No, that's good. That's a great observation. Right now, we're still on the hook for all of the orbital safety and flight safety coordination and really for the honors of the world. We're trying to go through the transition of flight safety, orbital safety, moving over to Department of Commerce and FAA and others that are taking on more of that civil responsibility where we can focus more on the military application. But certainly, we have to know where every piece of debris is. We have to know where it's going. And you brought up an important concept, and that's deviating from patterns of behavior. You didn't say it that way, but that's how I say it.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

I like it.

**Col. Raj Agrawal:**

And what I've charged my team to do, and I'm certainly asking industry and international partners to do, is to help us with mapping out patterns of behavior for every single object that orbits the earth and that projects national power. So that could be in the cislunar and so on. And then help us flag deviations from those patterns of behavior. Because what we have to do as a global community is provide safe and accessible space. It's an incredible opportunity for all nations and certainly for commerce. But if it becomes a place where unprofessional behavior occurs, where we're seeing that on a pretty routine basis, unfortunately, then we have to call that out immediately. We have to flag it, we have to see it, we have to acknowledge it, and if necessary, de-escalate it. And that's using all of the powers available to our nation and decision makers.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah. I would say, let's face it, to you. The Russians and the Chinese are truly developing their warfighting skillsets in space, especially as a domain. But Delta 2's mission is also space battle management.

**Col. Raj Agrawal:**

Yeah. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So you described battle management from surface to essentially geosynchronous, that 36,000 miles out, but all the way to the Moon and beyond, that cislunar. How do you manage all that? That's a huge battle space to manage.

**Col. Raj Agrawal:**

Yeah. Our service secretary, I mean, the Department of the Air Force is looking at battle management being a fundamental aspect of how we operate in the joint force, right? So battle management simply is taking that understanding and making decisions. So it's an inherently governmental function that our folks operate in. And it is probably not joint doctrine, but the way I break it down is, command and control is simply giving direction to forces. And I can almost write a checklist that does that, or I can contract out transmitting decisions from decision makers to forces, or I can automate some of those functions where decisions gets translated or rather the direction gets translated to forces.

But the decisions have to be teed up in a way that humans make them at the right time. Not that they are the reason things slow down, but those decisions that have ethics involved or have risk involved or



have consequences involved, you need a decision maker that's empowered with the authority and the training, expertise, a shared awareness, probably the most important thing, to be able to give that, to make that decision and then give the direction, however that direction then translates to forces.

So the reason I break that down is, you started our conversation with space situational awareness, and that is knowledge, right? And then you go to space domain awareness, and that is a military application, or understanding. The battle of management takes us really that next evolution forward and that's making decisions. So the translation from understanding and making decisions is where we have to train our military forces, particularly our Guardians, who may have come from other services into the Space Force where they provided a capability for other forces to make decisions with. Now what we're asking these Guardians and Airmen to do is, "No, no, no. You're the ones that have to understand there's an opportunity to exploit. You have to understand the capabilities that exist across the combat space forces and the joint force. And you have to know who you have to talk to and already have practiced that, being able to close on a tactical objective."

And what I want our forces to do... And this is not simply my idea, this is my boss's, General Miller, the new spot commander. He really wants us as a tactical force to operate integrated with each other and not be dependent on an operational C2, similar like an air operation center. Air operation center, you can call a high tactical, you can call operation. But a lot of the way we've done combat air power is we waited often for direction via an air tasking order. And that air tasking order would then come and say, "Here's what you need to do. Here's where you need to go. Here's where you need to drop a bomb. And you need to do it at this time, and then you report back."

Well, that's a very tactical, do a thing and report back. What we want to do is get to where our combat space forces aren't so dependent on that tactical direction, but know what needs to be done, how to do it, who to work with, and the other mission deltas, and how to close in that target. And then be able to operate independent of that move by move, play by play operational C2. And that's going to take some training and that's going to take some shared awareness and that's going to take a lot of practice and investing across at the tactical force. But that's where we're moving.

And as the secretary said, we're out of time. And so we've asked our team to really step up and move at a pace that maybe they're not used to moving, to operate in a joint environment with a joint lexicon that maybe they're not used to operating within. But they're coming out better.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So let's brag on your Guardians. I think that's important because obviously in re-optimizing for great power competition, we like to refer to as conflict, potential, how are your Guardians doing in terms of really getting into that war fighter mindset to re-optimize for a potential competition? And then what I think our audience really like to know is, are you resourced properly for that?

**Col. Raj Agrawal:**

Okay. No, it's good questions. First of all, in the Space Force, we hire absolutely the best. We don't have a challenge with recruiting. In fact, we interview each applicant and we look for specific character



attributes, educational attributes, experience. And so when they come into the U.S. Space Force, we already are getting the best and we end up having pretty high expectations of them. And so when we have asked our incoming Guardians, and I'm talking... When I transferred over to the U.S. Space Force from the Air Force, I wanted a Guardian to commission me that had never been in any other service. Because I wanted to be brought into their service.

And so a second lieutenant, his name is Aaron Brooks. In fact, I hired him to be my exec. He's my exec now. He commissioned me into the U.S. Space Force. And it's his energy and energy like his across our Guardians that have only known U.S. Space Force that I kind of feed off of, and I know that many of our senior leaders do as well, where they're agile, they're ready to take on the most challenging tasks. They understand why we stood up the U.S. Space Force in the context of great power competition. And they're not only thinking about some future potential or future conflict, but they're thinking about how do I, right now, campaign, we call it campaigning, where how do we achieve competitive objectives now with the resources we have now to stay ahead of competitors as opposed to waiting for some future state that we hope never happens, where we then have some kind of a high end conflict.

But we train for both, right? And we're doing both. So I don't know if I answered your question, but I certainly am... Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah, you did. Let's take it to another step further. Because these young Guardians have got an incredible set of skill sets that come to the fight. So from a resourcing perspective, again, artificial intelligence, machine learning, do you feel like you have the right equipment now or do you feel that these young Guardians want more and they have that insatiable appetite to up the game to be prepared to flight, basically to fight in, through and from space?

**Col. Raj Agrawal:**

It's a challenging question, right? Because I think when you have people that are as bright and curious as our Guardians, they're going to always want what is commercially available.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yes.

**Col. Raj Agrawal:**

And so they are opening often our eyes at more senior levels to what exists out there and how to connect what's happening out in industry to what we're doing in the service. And in the flip side, we're training the logic of military application. We're training the discipline and the professionalism that is necessary to being able to execute. So I think there's a good tension there between, I wouldn't say it's younger people only. I would say there's a tension within the U.S. Space Force that is very technology minded to continually pursue and demand the best that America can provide and certainly our international partners can provide, while at the same time, taking sometimes very old equipment and repurposing it to achieve pretty amazing things.

And we've seen that throughout American history and American warfare that Americans just... There's just something unique about American ingenuity and the fact that we value independence and we value individual freedom that makes us innovative, and we can take any situation and turn it into our advantage. And so I am always inspired by my team. And certainly, they demand the best from me in the same way I demand the best from them.



**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Well, I guess the old action really does apply as the Delta 2 commander. Put the capability in their hands, they're going to amaze you with what they're really going to do with it.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Are you able to keep up with them?

**Col. Raj Agrawal:**

No, I can't keep up. It's very humbling to be called a commander. I know that I'm charged with certain legal responsibilities and a certain expectations. But it's humbling because I have units all around the world, parts of a coalition, parts of it absolutely integrated, dependent on industry and commercial, and others that are full of simply military and civilian, Guardians and Airmen. But all of them, regardless of age, regardless of experience, regardless of education, are always bringing new things to the table.

There's one squadron in my Delta, the 20th Space Surveillance Squadron. It was called the 20th Space Control Squadron, and I was the commander of it a few years ago. And some of the civilians that are there, that are part of the maintenance team that maintain that radar, they're still bringing new ideas. And some of these folks are older than I am. And they're still, every day, innovating, bringing new ideas, excited about serving their nation, excited about being a part of the U.S. Space Force when they were before a part of the U.S. Air Force. And so no, I don't think I can keep up with the way they see the world. But I think they would say the same about me, that sometimes I'm moving at a pace that causes discomfort because I do ask the most of them because I believe they are our very best. And I believe that America deserves their very best.

And so we do balance all the various forms of health that we need to, to be able to be ready for combat. But my focus is on combat readiness.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Let's help your Guardians jump into your shoes for a second.

**Col. Raj Agrawal:**

Yeah, yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So you have quite a few folks you deal with, what I almost call customers or clients, interagency, specifically your industry partners. They're inextricably linked to your operational capability. But then you also mentioned your international. Pick one of the three or pick all three. But what's the challenge as the commander in terms of working with them? What comes to mind?

**Col. Raj Agrawal:**

Okay, good. I mean, the first thing that comes to mind is, there's a really good tension between unity of effort and unity of command. And so you've mentioned the international community... I mean, sorry, the intelligence community. They're such a big part of space demand awareness. Because what they're





doing is they're adding context to what we know where things are. The intel community adds what its intent is and what purpose it has, what characteristics, what signal characteristics they have. And they're working to really focus on how does each adversarial object and space behave. And we couldn't do anything without them.

But truth is I don't have command of their capabilities, I don't have command of their forces. Same for a lot of our international partners. They bring capabilities and data into our picture that I don't have command of and I certainly can't task. But in many ways, the neat thing about the international community is we train with them. The Global Sentinel was a big exercise that we just finished up not too long ago, and we do that on an annual basis. But it brings all like-minded nations to the table and space powers and aspiring space powers and those who are looking to take advantage of what does space give them from a military and national perspective. And we fight together. We train together, we fight together.

So there is a unity of effort aspect that I have to be cognizant of and I have to cooperate with other leaders, and I have to hopefully inspire followership or collaboration in ways that I don't have to do when they're under my command, where I can move faster, I can move with more direction and purpose, and I can prioritize. Human space flight safety is, I would say, our number one objective day to day. But I have to be able to transition quickly to supporting military engagements with those same resources and often have to make trades. And I have to be able to communicate very effectively to any stakeholders that, "Hey, I'm making a trade here to be able to close on a thing here, but then I can come back."

Because I don't have enough unity of command to be able to direct all of the inputs. So I have to make trades within my ability to make those trades, unity command, and then hope on the unity of effort aspect that they bridge gaps that I otherwise might not have.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Well, we know that space is just a huge growing enterprise, especially from an industry perspective, from startups, to literally fully capable large prime space.

**Col. Raj Agrawal:**

Yeah. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

If you have a chance now, what would you want from them? What would you tell them you need from industry specifically, from those that are just starting out, to those that are so mature they can develop whatever you need?

**Col. Raj Agrawal:**

Yeah. I'm probably not as skilled at answering that question as I think General Miller or General Saltzman would be. I've heard that they've answered some of their questions. But I will tell you, just from my perspective as a tactical leader is, we have requirements on the knowledge level, space situational awareness, and each regime, LEO, MEO, GEO, HEO. Actually, I'm using acronyms that mean everything from satellites that orbit close to the earth, all the way out far from the earth, and then those things that transit to the Moon and beyond. I have requirements from knowledge, I have requirements for understanding that domain awareness for each of those categories, and then I have requirements for battle management where I have to close, understand that there's an opportunity to do something.





And sometimes, that something is simply a defensive maneuver. Sometimes, it is looking for options to de-escalate an aggressive behavior. But I need quality-level information that is exploitable for each of those regimes and beyond. And commercial can get us there. What we have to do, I think, as government leaders is be very clear about where those opportunities are, how to incentivize with very specific data requirements and not just say in general, "Hey, I need space situational awareness, I need space domain awareness." And then be very clear on how we measure valid attainment of our needs and communicate clearly. I think we can be better there.

And so we're working with our tech director internal to Delta 2 and certainly within SpOC headquarters and Space Systems Command. We're working to partner together, to communicate to industry and to international partners, "Here's our exact needs, here's how you can measure independent of us, and then here's our scorecard and here's how we'll measure you." So without getting overly specific on where our gaps are, that's probably the best I can answer you.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Well, from the Secretary of the Air Force, SQ, Mr. Frank Calvelli, and I see Derek Tournear developing from the Space Development Agency.

**Col. Raj Agrawal:**

Yeah. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Obviously, their demand signal is delivering something that I can make operational now. So I'm kind of curious, how do you incorporate the commercial Space Development Agency capabilities? Obviously Tranche 0, and now we're getting ready for Tranche 1. How do you incorporate that in your way?

**Col. Raj Agrawal:**

Yeah. Dr. Tournear, I've known him really since the beginning of leading Space Development Agency. And he's brilliant.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yes, he is.

**Col. Raj Agrawal:**

He driving. And he's all about delivering for the war fighter and bridging the gap between the capability and the ability to field it, sustain it, operate it. That's the thing that we need to work through as we get emerging capability, whether that's direct from industry or from Space Development Agency or from a DARPA or any of our incredible innovative organizations within the Department of the Air Force. How do we take a capability, get it into the formation, and then sustain it, train to it, operate it, evaluate it? Listen, if we have to go into conflict immediately, I believe we can surge all that capability, operate it and be just fine. We have incredible talent and I think we'll be just fine.

It's just a matter of for how long and when does that, the ability to utilize a new capability, when does that begin to degrade due to lack of the backend is what I call it. So I want all of it. And I want it all fielded now. I think my challenge is, Secretary and General Saltzman have given us charges to develop people and capability. And my focus is more on the generate readiness part and the project power part. And I end up having to develop people with capabilities sometimes internally. But ideally, other parts of



the service, we'll do those aspects. And then give me people ready capability, and all I have to focus on is developing readiness and projecting power, and then hopefully that. But that's a thing that's a long term process that General Saltzman and General Miller are working in.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Well, let's go international for a second.

**Col. Raj Agrawal:**

Yeah. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Because when I think of the CSOs partnering to win line of effort. They are so integral, have been from day one for the Space Force, now four years old. So just recently, we just came out of our AFA Warfare Symposium. I really had a privilege of having General Mastalir, the Space Component Commander for the Pacific.

**Col. Raj Agrawal:**

He's phenomenal. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

INDOPACOM. And sitting right next to him was the Japanese space group commander.

**Col. Raj Agrawal:**

Kimi. Yeah, he's a good friend.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah. Kimi Sugiyama. So how do you integrate with them, beyond just Japan and Korea and the other nations? Can you give us some insights how Delta 2 commander and the team...

**Col. Raj Agrawal:**

Yeah. So let me back up a little bit. So there's an argument, and it's a valid argument that space situation awareness, space domain awareness are primarily intel functions. And I think you could make an argument that the surveillance aspect of what we do in SSA ought to be part of the intel apparatus. And I want to argue that. But I will tell you that SSA and SDA gives us a unique opportunity to engage with international partners in a policy permissive environment. Meaning, a lot of nations won't engage with a military force when it comes to space because it appears to be overly offensive or overly militarized.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Excuse me. Until it affects their wallet-

**Col. Raj Agrawal:**

Yeah, yeah, yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**



... and their ATM machines.

**Col. Raj Agrawal:**

Yeah, I got you. Yeah. That's true. And they won't engage with an intel organization.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Of course.

**Col. Raj Agrawal:**

Even more sensitive, right? But they will engage with a friendly SSA or SDA organization Space Delta 2. And that gives us such unique and open opportunity to engage with civil, to engage with policy types and military that are not ready to have the military space conversation, but are ready to meet with people that help keep space safe and accessible, which is what we do. And so certainly Japan, Korea, Australia, the UK, some of our partners that I've had the opportunity to engage with recently, they're very forward leaning, very much understand the need for application of military space for the purposes of joint and coalition objectives.

And Kimi, yeah, he's a commander of the Space Operations Group in Japan. And he and I developed a very good friendship because he reached out early on, wanted to improve his capability. One of the big things we're working on in Japan is merging data from their missile warning and missile defense apparatus and their space data to get a combined picture, much in the way that we're doing here in the U.S. And he just wanted to understand, "Hey, how can we be more postured?" And I said, "Hey, one of the things that you're doing, you're leaning forward on technology development in a way that is, in many ways, outpacing the U.S. And so how can we share? How can I share awareness of what you're seeing so you have context of what it means? And how can you share some of your technology outputs that we can benefit from what Japan's doing?"

And we came to some incredible agreements, made us both have more war fighting capacity as a result. One of the things that I ask our team to do when it comes to international engagement is, my focus is on containing adversarial influence, because some of our adversaries are extending into other nations around the world to increase their space surveillance footprint. And so how do we contain that influence? How do we add complexity to adversarial targeting solutions? So if I can have dual flagged capabilities like Japan's QZSS where we're putting a payload on a Japanese satellite for shared war fighting capacity, but that also adds complexity to anyone that would target us because now they have to target multiple nations if they target our capability.

So if I can have dual or multi-flagged capability, then that adds increased advantage to the U.S. and to our allies. And then finally, adding war fighting capacity. So those three C's when it comes to security cooperation is something we focus on, we take advantage of, and we get a lot of support across the Department of the Air Force for Delta 2's involvement and being proponent for space domain awareness.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah. I like how you're really alluding to is that having our international partners, our industry partners, we create an asymmetry that actually turns into first mover advantage, especially if you have the right asset.

**Col. Raj Agrawal:**



Or at least significant deterrents, right?

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yes.

**Col. Raj Agrawal:**

So if we can very clearly show that we're in this together, and targeting any of us targets all of us, it creates such an incredible deterrent effect that maintains a peace. Our objective across the U.S. Space Force and certainly across the joint force, none of us want to go to war. We want to prepare such that we don't have to. And if we must, we will win, but we don't want to go to war.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So let's go off on that right away. And that's important because, you mentioned it before. You're talking about doctrine. Let me pull on your weapon school graduate strings here. Because this is important. Everybody has thought of space in the past as being a supporting element to the fight. But going into the future, there's a supported function. You may be supporting or supported. Can you talk to that?

**Col. Raj Agrawal:**

Yeah. I mean, I can appreciate that Air Force base command, part of the U.S. Air Force before the U.S. Space Force existed, was very focused on providing capability to the joint war fighter. And I think, in many ways, that apparatus might've thought of itself as a capability provider, not as a war fighter themselves. I don't know if that's true or not. I didn't serve much in that organization. The closest I got was to, Air Force base command was in two geographically separated units. But I would say that the U.S. Air Force or the Army Air Corps could have been thought as a supporting capability to the ground forces.

And I would imagine that, depending on if you're in the Navy or the Army, you thought of one or the other as a supporting force. Right? I think all of us want to feel like we're the most important thing and everybody else is lesser or supporting. But truth is, anytime there's a center of gravity that shifts into a particular part of the national power, whether that's on the land or in the ocean or in the air, and now in space, you end up to where if you put your vulnerabilities into place, your adversaries are going to look to exploit the vulnerability and to take it out. And in space, we've built our entire military economic information apparatus on space. We have reached into parts of the world that we'd never otherwise would reach because of space.

We can put a bomb on a target with minimal collateral damage. And the American people expect zero innocence to die when we put a bomb on a target. I mean, we have shifted the narrative among the American people that there's very little tolerance for, if America goes to war or if we project power, that we have a very high bar. That collateral damage is unacceptable or very little. It's accepted very little. You take space out of that picture and our adversaries know that. You take space out of that. Now you have to change the conversation with the American people and you're can say, "Hey, we no longer can meet that bar. We're going to project power in a very messy way. If you commit us to war, commit us to conflict, we have to have a very different conversation about your acceptance of risk, acceptance of death."

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah.



**Col. Raj Agrawal:**

So protecting that center of gravity has now... Just in the same way that we used to have to protect the bomber with escort aircraft, and it used to be the bomber was the center of gravity that we had to protect. And I'm using the term probably loosely. Now we're having to do the same thing in space. And so without the ability to protect those critical capabilities, we lose. Right? And so you're making offenders. You have to make fighters in space. You have to make... I want to be careful. You have to create the ability to defend those assets. And the only way to do that is with a military service.

America has stood that up. Now, America has to give it the capability to do its job. You can't create a military service and understanding the threat and then not equip it to do military things. And so we're making progress. But yeah, there's going to be times when the space element has to be the supported element from other domains because we're moving to an any sensor, any shooter construct to where we have to create effects in any domain from any domain.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Well, that flows right into what the Secretary of the Air Force, Frank Kendall, is really working on is the next generation of capabilities. And when I talk about next generation air dominance, we talk about collaborative combat aircraft, the F-35 of tomorrow, the B-21. You and I were talking offline about space actually being in the cockpit to begin with and inextricably linking at all times. And at other times, space is find, fix, finish.

**Col. Raj Agrawal:**

That's right.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So talk about that in terms of the future, because you alluded to this. The Air Corps Tactical School of 1937 was thinking theory. Theory became reality and reality faced war. And we had to change strategy or tactics and stuff. How do you see the Space Force and how do you see Space Delta 2 in that theory of the future and the ability to literally be the supported sometimes, the supporting, and in some cases, in microseconds, they flip both ways?

**Col. Raj Agrawal:**

Yeah. I think we've really danced around the answer to that question through our talk today is, we're dealing with thinking adversaries that are on a peer or near peer level. It's very new to our generation of military members or very new to certainly the American people. And we have to get past assumptions that the way we plan is the way war will be executed or combat will be executed. We have to plan in such a way that we have to empower our tactical war fighters to be able to make decisions and move and execute without direct oversight.

We've trained a leadership that built a model off of maybe predator feeds where senior leaders could see through a camera onto the battlefield and have the perception of knowledge and complete knowledge to then make decisions sometimes from very far away. And technology gives that allure of leaders wanting to make decisions from far away with the belief that they have perfect knowledge and situational awareness to then make decisions for the tactical force.

We have to change that. We have to optimize use of technology, but we also have to empower the tactical force, knowing... And that's scary, right? That's a scary thing for a leader to say, "I think I know what the right answer is, but I have to trust my tactical force to be able to move within my intent as



opposed to under my thumb." And I would say that is where I'd like to see our U.S. Space Force and our joint force go now, not wait, because we just don't have time against just thinking adversary to do business the way we did it before.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

We got a couple more minutes before we turn it to our audience and let them start asking questions of you specifically, Raj.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

It was interesting. I had asked Malcolm Gladwell, the author of Bomber Mafia.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

I said, "When do you think the Space Corps Tactical School is going to stand up?" I'm not going to ask you that question.

**Col. Raj Agrawal:**

That's right.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

But rather what I'm going to ask you is the 75th Intelligence, Surveillance and Reconnaissance Squadron within the Space Delta 7.

**Col. Raj Agrawal:**

Yeah. Yeah. Brett Swigert is a good friend of mine.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Talk to that linkage for Space Delta 2 with Space Delta 7.

**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

How do you bring that together now?

**Col. Raj Agrawal:**

No, that's a good question. Colonel Brett Swigert, good friend of mine, he's commander of Delta 7. We talk often about how do we bridge the gap between intelligence, surveillance, reconnaissance and space domain awareness because there's a lot of linkages there. So each of our mission deltas actually has a



component of Delta 7 inside our headquarters. And so I have... My S2, my Intel Directorate is actually a component of Delta 7 that's attached forces, not assigned forces to me. And so they bring all of the capability that Delta 7 can provide, and they have connectivity to every like organization in the other mission deltas, so their intel peers in the other deltas, and they're able to pull together information very quickly on what our needs are.

In particular, the 75th is just doing what a service does. We call them baseball cards. We build baseball cards for each of our critical concerns, and we build descriptions of them. And what's so important that they're giving us is that we're able to maintain custody, we call it maintaining custody, of critical concerns, not just using my assets or space situational awareness assets, but intel assets as well. So they've become fundamental to empowering a tactical force to know where their opportunities are to be able to close on engagement.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

So you actually have an OPCON of those.

**Col. Raj Agrawal:**

I don't know if I like the words OPCON or TACON. But I certainly have command authority over them and I give them direction with permission from Colonel Swigert. Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Okay. Would it be unfair to ask which is the Mickey Mantle baseball card that you have the highest focus on?

**Col. Raj Agrawal:**

It would be okay to ask. I just won't answer.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Very good. Okay. I think it's time for our audience to ask you the question. I think now, we'll open up to the audience questions. A reminder to each of you, please unmute yourself before you ask a question. You may also type your questions in the chat box, and I will do my best to get them to you, to Raj. Now, we'll start with Greg Hadley from the Air & Space Forces Magazine. Greg, if you're up, first question is yours.

**Greg Hadley:**

Hi. Can you hear me?

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

We can. Go ahead, please.

**Greg Hadley:**

Hi, Colonel. Thanks for doing this. I wanted to go back to something you mentioned at the beginning of the conversation about object tracking and the move towards the Department of Commerce and the FAA taking some of that on. What would doing that allow for your Delta to focus on and how beneficial would that be for you to focus more on the more military aspect of things?





**Col. Raj Agrawal:**

Yeah, it's a good question, and it comes up fairly often. I'll tell you, we have some incredible minds that are working through the complexities of responsibilities, what transfer over to Department of Commerce, what their capabilities in the near term are, and where they'd like to go. I think there's a misperception that I'll have less mission or less responsibility once civil or commercial space flight safety moves away. I still have to know where everything is, and I still have to know to the degree that I must, the safety of our assets on orbit.

I don't know what the relationship will be with NASA and us. Right now, we're their gold standard for protecting humans in space. But our mission is growing so fast because of what we call mega constellations. It used to be, you'd have one rocket go up and it'd be one satellite that would pop off. Now, it can be hundreds. And keeping that transit safe, keeping the placement of each of these satellites safe, keeping other satellites safe from those new satellites, all of that adds tremendous amount of complexity. And we have big brains in our battle management centers that are focused on providing for that safety.

So I will say that once Department of Commerce is able to take on responsibility for civil and commercial, some of the contacts that we make... We make contacts with operators on a routine basis for potential collision avoidance, messaging and engaging on options of how do you avoid or how do you provide for safety? We would be out of those kinds of conversations. Department of Commerce would be in that. And so that would free up maybe that part of our brain to focus more on the military application, but we still will be very much involved in knowing where everything is and knowing what its intent is.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah. I have a question online from Sarah Iskander, and I think it's a good one because it flows with what you're discussing. She says, "Should the U.S. government commit to the defense of Starlink or other dual-use satellites?"

**Col. Raj Agrawal:**

That's an interesting question the way it's asked. A part of the way we do business as a nation is that any satellites that are launched from a particular nation, that nation is essentially liable for the behaviors of those satellites and the dangers those satellites might cause. So we're not necessarily providing for the defense of commercial capability. We certainly are aware of potential dangers to those satellites. But I'm not a policy guy, and so I want to be careful that I don't speak on behalf of policy or assume that I know what I'm talking about when it comes to policy.

And what you're asking about is more of a policy level question on, "Hey, if the military relies on a commercial capability, are we on the hook then to defend that capability from harm?" I don't believe that we are, and I don't believe that we're going in that direction. But we do take it very seriously today that everybody that operates a satellite gets an opportunity to know if their satellite is going to cause harm or if something is going to cause harm to it. And we do everything we can.

We have a great relationship in this case with SpaceX to have those kinds of conversations about responsibility, about accountability. Every launch that goes up, we have conversations about what the intent is and how many satellites and how do we make sure that they get there safely and they don't cause harm. And they've been very open to that, not doing it in a reckless way whatsoever.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**



Well, I would think that the combatant commanders would promulgate any priorities of effort in space, especially if it means the defense or the offense from that perspective.

**Col. Raj Agrawal:**

Yeah, that's a general writing in a certainly U.S. Space Command question. But in Delta 2, I present forces to U.S. Space Command, and I do all the organized training equipped for those forces to include how they do their job, how they task everything. And so when it comes to the responsibility that we feel at the tactical level for orbital safety, we feel that every day, and we believe ourselves to be at least tactically responsible to meet the command commander's objectives in that area.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

I have another question from online. It's John Slattery. He says, "Curious how the IMD," I'm assuming integrated missile defense "concept will work for Delta 2."

**Col. Raj Agrawal:**

I think he means integrated mission delta.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Thank you. Thank you.

**Col. Raj Agrawal:**

The IMD construct. And what the integrated mission delta concept is, is... And I'm not going to do great with describing it. I'm not an expert in this area. But it's taking operations, which I do, and taking sustainment, sustainment right now lives in Space Systems Command, and taking that and merging it with operations so that I'm not dependent on another commander for risk imposed on my mission due to sustainment prioritization. So if I have a radar that breaks... And I have some old systems, telescopes and radars and such. And if they break, someone else right now makes a decision whether or not they fix it, or if they're going to resource spare parts and other things and have a plan to sustain it.

Right now, I will say that all of the mission deltas have been directed to go to integrated mission deltas. So we are, at some point in the near future, going to absorb some form of sustainment into... Or will be absorbed by them. It just depends on where General Saltzman and where General Miller and General Grant go and which missions become primarily an operations IMD and which ones become systems deltas which primarily focus on the acquisition and they own it from an acquisition lens as opposed to an operation design.

So I'm not equipped or empowered to speak on that other than to say I'm looking forward to it because the closer I can get to unity of command as opposed to unity of effort, the faster and the more agile I can be when it comes to a space domain awareness and battle management perspective.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

I promise I'll throw my dollar in the jar for IMD next time.

**Col. Raj Agrawal:**

Yeah, I know. No, you got it right.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**



So we have an anonymous question, which I think is important. So what is the biggest challenge you face and what do you need industry to actually solve?

**Col. Raj Agrawal:**

Yeah. My biggest challenge, I think, and it's probably not something industry can help me with, is getting our Guardians and Airmen to understand the why at pace, right? So when the secretary and General Saltzman and General Miller say, "Hey, we're out of time. We've got to do this right now." There isn't a whole lot of time to get buy-in if the buy-in isn't already there. Within Delta 2, we've been preparing, I think, probably since I took command, but certainly before then. Our Guardians and Airmen, we were already talking about the why with them, already investing in those kinds of talks and that buy-in and that understanding, that deliberate leadership.

So when the secretary recently came and said, I think, it was at the last Warfighter Symposium, said, "Hey, we're out of time. We're doing this right now." General Saltzman had already been preparing this. So that wasn't new to the U.S. Space Force.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

That's good.

**Col. Raj Agrawal:**

But I still believe our greatest challenge is developing our people in a way that they believe that all of this that's happening right now depends on them at the individual level. And maybe industry can help us there when it comes to organizational design and helping us remain flat as a Space Force and not become bureaucratic over time. But I think that's my number one challenge. My number two, I've already mentioned a couple of times, is unity of command. It's scary to give a commander all of the risk awareness and mitigation ownership. That's scary.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

It is.

**Col. Raj Agrawal:**

But we've got to get to a point where we trust. We empower commanders, train them, give them the education, give them awareness, and then trust them. And that way, we can work on an integrated level to do the thing we're tasked to do, to integrate with each other and support the joint fight. The more we're on unity of effort, the slower we're going to go and we're going to be on a hope, we call it hope COA, right? A hope course of action, as opposed to something where you can trust anticipated and expected outcomes.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

We got about five minutes. I got a great question here from Rachel Vijayapandian.

**Col. Raj Agrawal:**

All right.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

First of all, she says, "Thanks, Colonel."



**Col. Raj Agrawal:**

Yeah.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

You evoke the joint actions, i.e. Japan through payloads. Under what type of agreement the roles and responsibilities are set with the international allies and partners?

**Col. Raj Agrawal:**

I'm probably not connecting to this question as well as probably as it's written, but we do have an apparatus through our International Affairs Office, SAF/IA, that works with each of the field commands. Space Systems Command is the one that they worked with to enter into this agreement with Japan's Air Defense Force. I probably said that wrong.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

It's okay.

**Col. Raj Agrawal:**

And then work toward an outcome where we identified... And I say we, meaning the big we, identified a particular satellite that we felt met the requirements for a payload, we put together, got them paired together through some type of legal agreement and arrived at a conclusion where we could do this together. But I am not skilled at the particular types of agreements, but I did work in... I did stay at a Holiday Inn Express. I did work in SAF/IA for about a year and helped Ms. Kelli Seybolt re-stand up, stand up again in the space division to really focus efforts on space equities, space security cooperation. I got to experience what that's like to partner with other nations and look for opportunities to work together to bridge gaps, and to really most importantly build their industrial bases, because what we want is a competitive environment to where we drive down costs, encourage innovation around the world, and then take advantage of each other's capabilities so we're all better together.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Yeah. This has been awesome. I want to give you some time, at least the last couple minutes remaining. Just some thoughts. What do you want us to take home about both your delta, but just in general, the major direction of the U.S. Space Force, especially as you mentioned general Miller and where we're going in the warfighting construct of the future?

**Col. Raj Agrawal:**

I certainly can't speak from a perspective of General Miller, General Saltzman's end. I can speak from the perspective of a tactical commander.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Perfect.

**Col. Raj Agrawal:**

I think, right now, technology's giving us an opportunity where we can choose to centralize all of our command and control and put all of our best minds in that command and control center and automate everything else. And I think there's logic there because we have the technology to do that. We can,



again, put all the brains and all the capability in one or two centers, automate direction of forces and get speed, get agility, get capability all in one place. Or we can use that same technology and say, "Hey, let's put all the brain power and awareness at the tactical force and give all the capability of decision-making down to the tactical forces. Only the major decisions happen at the operational level, but empower the tactical warfighter."

Truth is, I think if you centralize everything, you'll be able to manage a handful of engagements and you'll do them very, very well. And you're going to believe that you have perfect awareness and you're going to believe that you understand what's happening at the tactical forces and what they're going through and their capacity and what cyber things are going on, what space things are going on and all that. Or you can optimize and scale, empower the tactical force. It's a lot scarier because you're not quite sure if the tactical force would do what you want them to do, but they're going to have far better awareness of their tactical environment than you will. And how do we use technology to get the best out of our U.S. Military and our U.S. Space Forces.

I am in the camp of empower the tactical force. And that's going to require a whole lot more leadership, a whole lot more awareness, a whole lot more education, and most importantly, a whole lot more trust. And I think we'll grow better leaders as a result. I think we'll have better war fighting outcomes. And in the long run, you're going to get buy-in, which is really what you want in a professional military force, is you want people to come into the service, experience that service and say, "I want to stay in the service." And I think empowering the tactical force is how you do that.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Raj, literally on behalf of our sponsors for the Warfighters in Action series, myself and all of the Air & Space Force Association, I have had an absolutely wonderful time talking to you today.

**Col. Raj Agrawal:**

Thank you.

**Maj. Gen. Doug Raaberg, USAF (Ret.):**

Thank you. So we're out of time. And thank you so much for joining us. Now, don't forget to tune in tomorrow, or join us in-person here at AFA headquarters for our next Warfighters in Action with Dr. Ravi Chaudhary, Assistant Secretary of the Air Force for Energy, Installations and Logistics. It's not too late to register. Scan the QR code on the screen or go to [AFA.org](http://AFA.org) and search under events. Thank you.