



Brig. Gen. Jason Bartolomei:

Okay, good volume's working. All right, well good afternoon everybody. It looks like folks are still getting done with lunch and they're trickling in, but I think we've got a power packed presentation this afternoon on a very important and timely discussion on weapons. And I will tell you as PEO weapons, I really believe we're in a historic time. I think world events with what's happening in Ukraine and sort of in light of what's happening in the Pacific has put a focus on weapons that I don't think we've seen in decades. And so I think that you all picked the right panel and we've got the right guests to talk about this important topic.

And I thought I'd start a little bit just to help everybody understand where we've been in the last year. So for those that don't know, the secretary established a munitions crosscutting operational enabler as one of the three cross-cutting operational enablers with the seven operational imperatives. And one of the motivating factors for that was the fact that weapons were coming up all across the seven OIs. In fact, I think the way I've heard senior leadership talk about is it was a very important of five of the seven operational imperatives. And then the secretary decided really sort of midstream in season one for the OIs to establish the COE. And so last fall we got started and have been fast at work with several mission partners representing all of the match comms, the air staff, industry partners and mission partners. And the first year of the munition COE had three important areas. The first one was focused on the right weapons and understanding where do we need to be with the weapons portfolio to really be where we want to be.

And then the second one was how we might be able to work together as an enterprise with industry with the many government agencies. In fact, I have a chart I like to put up that inside the weapons enterprise, not only do we service many of the match comms, but we have somewhere over 50 different mission partners from across the Air Force and the DOD enterprise that are very important and vital to get weapons on platforms and on target. So it's a big enterprise and one of the demands is how can we go faster and accelerate the delivery of those. And then the last one was really focused on weapons capacity. Not just do we have enough of the right weapons, but are we in a good position to replenish the inventories as a needed basis because I think what we've been learning is that weapons are very important and the ability to replenish them is a vital. And so season two is underway. We are already at work and we have similar type priorities for season two. We're going to continue focused on getting the right weapons and accelerating, but this year we're going to have a special focus on integration and how actually the enterprise has a certain amount of synchronizing with the warhead or the weapon. And it's interesting as I became the PEO of weapons, how important the entirety of the kill chain is if you are the weapon.

And so I'm really looking forward to the discussion today. Hopefully there'll be some good Q&A and if not, we'll be available at the end of the discussion for you. And so I'd like to introduce our distinguished guests starting to my left, James McDonough, he is program director at BAE Systems Precision Strike and Sensing Solutions business. I think he'll offer a really great perspective as a key supplier for a number of the weapons and how he's approaching that. We've got Ashley Brawner, who is a program director for Hypersonics and Advanced Materials in Leidos Dynetics Group, Aerospace Defense and Civil Operation. Isn't it great to have the word hypersonic in your job title? I mean, that's pretty cool. We should all have that in our job title. And then we've got everybody's friend, "Storming" Jon Norman, who's Vice President of Requirements and Capabilities for Air Power at Raytheon, and he is here to offer his perspective as a company that's been in the business for a very, very long time. And I think we've got such a good diversity of experience and expertise here.

So what I thought I'd do, James, is start with you and then we'll give everybody a chance to respond. But as you've seen the demand signal from the Air Force and some of the results of season one of the COE,



can you share with us your perspective on what are the right weapons and perhaps maybe from your perspective, some of the things that we should be thinking about as we think about the future?

James McDonough:

Yeah, thanks sir. As we think of BAE as a real supplier precision guide solutions, and we look at what the next fight's going to look like, we anticipate high volume of targets. They're all going to be moving, they're all going to have a lot of self-protection or other protection provided for them. So as we look at our products and where we're trying to move, we're really looking to have more and more of that kill chain being done on the weapon. So if you think about the weapon has to do the final fix, target track and engage on its own, it needs to do it in volume and it needs to survive as it hits that target. And the other critical thing is it has to scale, right? We have to be able to build a lot of these and they've got to scale across the spectrum of affordable mass all the way through the exquisite. And really we think you need to have those same capabilities scaled all the way down from the affordable mass to the exquisite. So there needs to be some level of capability regardless of the price point. So that's really the key thing we've been thinking about is how do we do that and how do we deliver that scale and not only scale in terms of the capability, but also with the cost scale.

Brig. Gen. Jason Bartolomei:

So James, I think it's interesting because in some respects, one way we've been thinking about weapons is as more of a Christmas tree with ornaments and we've been emphasizing weapon open system architecture and government reference architecture for the weapons enterprise that I think has really pivoted the conversation with industry to think smartly about how we're designing the system so that they can be more innovation friendly and for opportunities for companies like BAE to hang their different ornaments on their trees. So Ashley, from your vantage point, Leidos has been very aggressive in designing modular systems. I've had the opportunity to see a lot of the bright ideas in your company and where they can go. From where you sit, what are your thoughts about right weapons and those features?

Ashley Brawner:

Yeah, so in addition to the right weapons, I think it also comes down to what are the types of capabilities that each of those weapons also deliver so that we understand the different suites that we need to put together. And as we provide backbones for modularity, which is abundantly important so that we can take the various widgets that our partners are putting out there, but it provides us the opportunity to get into economies of scale where maybe even materials-wise, we can change the outer mold line or the TPS structure that might be on that munition. But it's a very difficult question, it's a very broad question as well because I think it's the, as you stated, the pyramid, you're going to have a lot of maybe lower speed, higher volume systems where you need smarter capabilities because our adversary is very aggressive and we've got to be smarter because we're not going to go at scale, maybe not go at scale or power competition from that perspective. And so as we go up the pyramid as much of that backbone to include the entire system so that we can really scale up and provide the capacity that's required all the way up to the exquisite, the JASOMs, the PACOMs, whatever's coming next.

Brig. Gen. Jason Bartolomei:

Well, you're a good straight man, Ashley, because that's exactly where I was going to go with Storming is we talk about this idea of a weapons pyramid and Ashley hinted at it and at the very top of the pyramid are some venerable and powerful weapons that are expensive but highly capable. And as you look sort



of down the pyramid, you see the need and demand signal for affordable mass, like Ashley said. And I thought it was interesting that Ashley worked her way up the pyramid, which I actually really like how she phrased that. But John, from where you sit in terms of right weapons, can you talk to us a little bit about what Raytheon sees or what you see in terms of the exquisite and the affordable and how does this all play together from where you sit at Raytheon?

Jon Norman:

Sure. Well, thank you. Great question. I'd start with you're in the right business having General Bartolomei as our PEO, probably one of the most rewarding and most important jobs I think that you'll have in the Air Force. If you're a student of history, modern history, you realize that weapons are always the bill payer. Always the bill payer across everything we do in DOD. And so we've got to get it right and we've got to get it right the first time. There is that spectrum. So we have a bunch of franchise weapons. It could be something as simple as an unguided rocket that you add a laser capability to the front, provides an incredible capability with low CD. It could be a JDAM that we put a laser on that we modify that now we're able to sink a ship with by exploiting it below the hole and lifting that up to taking any other franchise weapon and improving it. We're doing that with AMRAAM. We're doing it in concert with the Air Force and with the war fighter to provide more capability.

The advantage and I'd say probably the most critical thing that we have from weapons is that weapon that's in the munition stockpile. We can experiment and we can boil chemicals forever, but if we're not delivering capability out to the war fighter in mass, then we're kind of failing. So it's a balance between what can we modify from the existing franchise programs to provide additional capability to address those evolutions in the threat capability. And then to your point, what do we invest in the future? What are those key strategic bets that we have to make that have those new attributes? So it could be speed, hypersonic. It could be a level of survivability, whether it's on onboard or in the outer mold line design, or it could be the volume that we're going to need for some of our deep penetrating platforms. And so I'd say that our best bet across the industry is to be very, very closely partnered with the Air Force, with your team, sir, and working to assess that threat, working to show what we can modify and we can advance through PQDI, but most importantly what we need to invest in for those future game changers.

Brig. Gen. Jason Bartolomei:

Yeah, thanks Norman. So Ashley, I'm going to go a little deeper now and talk a little bit not about what the right weapons are, but getting industry's perspective on how we bring these weapons to market. And I was thinking about the advances that we're seeing in what Digital Open and Agile is bringing to the fight. And when I think about Agile, Ashley, I'm not talking just about software, but how the business practices in some respects are sort of being modernized. So I guess I'm curious from your perspective, Ashley, what are your thoughts about what you see going forward and how Digital Agile and Open can be applied to weapons and maybe take us to places we haven't been before.

Ashley Brawner:

To kind of build on what Jon was saying with the evolutionary approach. We probably need to do this in a phased approach when it comes to rolling out Digital Open and Agile systems. It's not that we can't do it, we can do it, but we can't forget about our legacy systems and the need to update those, they're not going away. And so we've really got to lean into this with that evolution in mind while also the strategic big bets for revolutionary leap ahead type of technologies. And so what Digital Open and Agile provides us is the opportunity space to go across the board from program management, financials all the way through modeling and sim and making sure that our models are anchored and validated. Which is one of



the things that we find as we're coming out of Afghanistan and Iraq and in the 20 years that we've been doing that is now we've got an aging workforce and folks that aren't necessarily as interested in coming into maybe the DOD.

But if you have digital open system approach, you have the opportunity space to do things much more quickly, which is something that our younger, early professionals are really going to be excited about. And We can't do things like the old way. It's time for us to really step into the new and it provides... I mean I could talk all day about this because the opportunity space is limitless, but it's got to be methodical and it's got to be done right because we still have to meet our DOT&E requirements to get these systems ready for the war fighter. It's not just going to be plug and play tomorrow.

Brig. Gen. Jason Bartolomei:

So I grew up with the Sears catalog and I don't know if anybody is old enough to remember that in the room, but judging by some of the tops of people's heads out there, I think you saw one too. And what's interesting is that my kids don't even know what a Sears catalog is. And so Storming, as we think about Digital Agile Open, one of the things that is becoming clear to me is the barriers to get into the game are getting lower and lower. The CapEx, the investments, the types of things that traditionally kept people out, those things are actually not as big of a challenge anymore. So I guess my question for one of our leading companies for decades in delivering weapons, how does a big company look at Digital Agile Open and see the opportunity space but also guard against not letting the innovator's dilemma sink the S-curve for big companies? So what do you think about that, Jon?

Jon Norman:

I think it's powerful. It's a speed to market. So from a design development to a fielding through that test, we're able to do this very, very quickly. We can iterate very, very quickly in partnership with the Air Force. We can make significant design changes, run those through very high fidelity models, see what the output, how does that change it? Does the Air Force buy into that? Does it meet the capability requirements they're looking for and then press forward with it? We can do these design changes instead of bending metal or machining metal. We can do them very, very rapidly on a computer. We can run them through that model and now we can get this in the test.

I think the next big step that we have to do both with industry and with the Air Force, and this is where I think the WOSA MOSA design will help, it's that integration piece because that costs a lot of money and it takes a lot of time. And we have to get to that point where there's enough trust in those models that we use that will accept a modeling solution for that integration, that test instead of actually flying it all the way through SEEK EAGLE to employment as we go through all the different iterations and regression testing. If we can do that digitally, we can feel capability in months instead of years, which is where we have to be.

Brig. Gen. Jason Bartolomei:

Well, so James, as a kind of a merchant supplier that has ornaments, I could imagine that other ornament makers like the idea of being able to find a greater opportunity for ornaments to hang on different weapons. And one of the things that has surprised me as the PEO is that when you really dive into the ecosystem, the genome of the weapons portfolio has a lot of commonality of things, they just come in different sizes. And so from a Digital Agile Open perspective, as a merchant supplier, can you share with us your thoughts about things that we could be doing to make business easier, better, and also I think that translates to more capable weapons. Any thoughts on that from where you sit?



James McDonough:

Yeah, we've embraced the Digital Open Agile here at BAE with our products and as you said, as an ornament supplier of electronics and that's a couple dimensions. One, we're taking a more product-based approach to have something that's more portable across different weapons systems. And key to that is each weapon system is different size. So you actually have to be able to modify your form factor pretty regularly. And then ultimately moving to software to find architectures are pretty critical for us. So we've embraced that. We've gone down to the [inaudible 00:18:39], we've gotten the WOSA OSA criticality, but that worked going forward.

But we've also showed on efforts QuickSync that we can actually plug our seekers into the front of a JDAM and use the same interface that is being used for the seekers that are in the field right now. We didn't require any changes. So doing that's pretty important and every weapon system's going to have a different form fit function based on the form factor available. So we've embraced our approach that allows us to do that and change how we fit it because that's what's going to let us move faster, we're going to have hardware that's qualified from other systems that's already ready to go. And really it becomes a decision on what software you want to fit the mission conops and the flight profile of that system. So that's really how we're changing how we do business and we want to be a provider to whoever's out there.

Brig. Gen. Jason Bartolomei:

So I think to just stay with Digital Agile Open for a second, I kind of open it up before we go to the next block of questions and a couple thoughts that go through my mind that I'd like y'all's reaction to. One is that I think that digital fabrication is kind of the next big thing. I mean, from where I sit as PEO, I think we've been talking a lot about the power of digital on the front end to help set designs, help with testing, help with others, but what I see is that the digital fabrication is catching up and it's opening doors that could be really interesting.

I guess my question is that as the government works with industry to cooperate on setting standards and thinking about these sorts of things, what are some thoughts you see that could actually help facilitate and help us to go faster that might be blockers? Like the role of government reference architecture and standards definition. Who knows maybe in the future we have integrating bodies on how we actually integrate and fabricate the weapons so that once we design a weapon, we talk about how we actually will form it so that we could actually distribute how that's done if we are under duress. I mean, there's a lot of interesting ideas on the table. I'm interested in your thoughts on anything that I'm saying. And maybe Storming, I'll start with you if anything comes to mind, but maybe Ashley and James.

Jon Norman:

I think across all industry, we've kind of went through a period previously in the Air Force where we did a lot of experimentation. It was very [inaudible 00:21:12], and we failed to deliver capability. I think we're all rapidly approaching that point where we have to pick what are those critical technologies that we need to deliver quickly, and I think having that open system architecture and that WOSA design from the start is critical. There's more to it than just that.

Brig. Gen. Jason Bartolomei:

Sure.

Jon Norman:



There's this design for exportability. It is given lip service often, but we've got to have that in there because it does us no good as an Air Force or as another DOD component using these weapons that we're working on if our partners don't have a light capability. Look to what the Air Force is doing with agile combat employment. And so as we rotate forces in and out of operating locations and we fall down on a partner location, we need to be able to load up similar weapons and they have to be integrated with our platforms and we have to be able to employ them. When we're fighting coalition operations, they have to have light tactics, techniques and procedures, which means they have to have similar capabilities. So that has to be built in there and it has to be part of our consideration.

Brig. Gen. Jason Bartolomei:

That's great. Ashley, James, any thoughts come to mind on the government reference architecture, digital fab, kind of what you all are seeing and kind of looking at your crystal balls on those things?

Ashley Brawner:

Yeah, I think as much as the Air Force can share those government reference architectures that are being developed because-

Brig. Gen. Jason Bartolomei:

They're better.

Ashley Brawner:

... I know that they're being developed in different stove pipes just like we do in industry. As much as can be shared, I think that that's always helpful because sometimes in industry we think we have the best and brightest idea that will solve every services problems, right? And so being able to really put that up against your architecture ahead of that versus going down those paths as we're making IRAD and CapEx decisions, I think that that's something that could be very useful in addition to what John said with really publishing the WOSA MOSA requirements because then I feel like that opens up the solution space and the opportunity space to industry a bit large, which includes academia, small businesses, and our allies as much as possible.

Brig. Gen. Jason Bartolomei:

Oh, thanks Ashley. And so James, I'm going to even get more specific on the software dimension of the WOSA. What we see is that the way we architect certain weapons, we often don't treat the hardware and software in a very elegant fashion, it ends up kind of finding itself all over the designs. And I think for the types of subsystems that you think about that are software heavy, any thoughts about how we could be thinking about how software and the hardware in those government reference architectures could be enhanced or better and how we could work together to make that happen?

James McDonough:

Yeah, I mean, definitely the WOSA MOSA interfaces, the government reference architectures are all very good tools for us, I think to inform decisions. But what I'd like to see them expand a little bit more too is maybe earlier in the AOA, is also thinking about what's the rate we're going to need? How much do we need to build? Because all those are the real limiting factors I think that affect us in moving fast, right? Our process is typically set to start a new and do a new system idea from start to finish as opposed to looking at what we have, how do we harvest and how do we move faster? There's a real sense of urgency right now I think across industry and the services in terms of how do we move fast, but we don't



have really good tools for us to mutually collaborate on how to do that and look at, "I really need 4,000 weapons." If I just take what I have now, the highest rate I can move is at a thousand per year. But what are the alternatives I have to get some capability at a faster pace?

Brig. Gen. Jason Bartolomei:

No, that's really, really good. So that actually gets us to the cooperation between industry and the government and one of the core values of the armament director is winning together. And that is important not only inside of EB but with our other government partners, but especially with industry. So I guess maybe James, if you could talk a little bit about what you see as things we could practically do to have better cooperation and what that might produce in terms of outcomes.

James McDonough:

Yeah, I mean we all have the same goal. We all want to outfit the war fighter with the best kit possible in the time available. And I think the barriers these days is, like I said, we feel that sense of urgency right now and our practices require both sides to kind of work independently a bit. I think if we could find ways to talk more openly about what we need by when, and then collectively how do we get there faster, it might not be the perfect solution. We may want really something that's got all the ornaments in the world on it, but it's imperative that we get something out there sooner that maybe has three ornaments instead of four, I think. So I think that's the dialogue I'd like to see us start to have more collectively between industry and the services.

Brig. Gen. Jason Bartolomei:

So from a Leidos perspective, Ashley, I mean if I were just to look at weapons over the last several decades, it looks like a very vendor locked pool. And it probably is frustrating for companies that think they have great ideas to breakthrough. And so I guess I really think, James, you're hitting on it, is we need to expand the ecosystem because we don't have a corner market on good ideas and the way the threat is advancing. We need to be able to bring different ornaments in and really cooperate as an industrial base, but do it in a way that still makes money because after all, this is a country where we are capitalists, we have profits, and we have oftentimes shareholders and interests. So Ashley, any thoughts about that cooperation and from where you sit, what are some of your thoughts?

Ashley Brawner:

I thought maybe I'd get the profit question.

Brig. Gen. Jason Bartolomei:

Ashley, do you want to talk about profits?

Ashley Brawner:

No, I mean, we're all here because we're dedicated and committed to the war fighters. So opening up these dialogues in a way where in the vendor lock those trying to enter understand the mission engineering here.

Brig. Gen. Jason Bartolomei:

Yeah.



Ashley Brawner:

What Are the distances that we're talking about? What are the speeds that we're talking about? How smart do these systems have to be so that we can lean into what's next here? And then also looking at the lessons learned that the country has. I mean, there's a lot of things that can be applied from the Cold War to what we're doing now. There were a lot of lessons learned and a lot of things that didn't go well and we were more risk tolerant then. And so as the government, as the Air Force looks at upgrading and modernizing, looking at ways that we can take on more risk so that we can roll out these smarter widgets, ornaments onto legacy platforms as we dive into the bigger risk, the higher strategic systems, and when I say strategic, that means more the bigger bet types of capabilities. I think that that would be really something that would be useful to the middle tier and the innovators out there, because this is America, we've got an abundance of opportunity and the brightest individuals. And so really tapping into that from with the government leading us and teaching us as the new workforce comes on, I think would be very beneficial because we don't want to make those mistakes again. We don't have the time for it. We've got to get these systems out tomorrow.

Brig. Gen. Jason Bartolomei:

So Ashley, just to takeaway from that is that the more we're communicating and the better the demand signal and the clearer the demand signal the better. And that is really a great feedback and I think something for a lot of us to think about. So Storming maybe I'll ask you the sort of profit question, right? And you all could jump in James and Ashley. When we talk about moving down the pyramid, I think if I was a CFO and I thought about delivering low cost affordable mass, I would be struggling to try to figure out, "Well, what is the business case for something like that?" Yet it may be the very thing that could be decisive in a victorious fight. So any thoughts on that dimension, Storming, because you've been thinking about this for as long as anybody. How do we fill out that pyramid and what do we need to do in terms of working together between industry and the government?

Jon Norman:

Well, I think it's how we look at it. So you talk about vendor lock, there are a few components that we organically make on any weapon that we're integrating. I think that's true across all defense industry. So it's a very diverse supply base, and I think you're going down the right path with what you have Colonel Athren doing. And I think that's the beauty of the WOSA MOSA, our digital design, we have to get to the point where we're developing these composable weapons. And I say that because I look at the threats, what makes them iterate and go really, really fast. Our pacing threat makes a lot of money worldwide. We're a fairly rich nation as well.

What they do very, very well is that basic design, because quantity has its own quality, that basic design addresses a target set and then they're able to iterate improvements, PQDI improvements, whether it's for propulsion stack change, secret change, warhead change, the way they do the data link or the way it's integrated onto a platform. It's an incremental change there, but they filled it as a totally different weapon. And that's the way we're going to be able to go fast. I think as industry, as we look at that that's where that close coordination with the services and having a good understanding of that pacing threat and where the gaps are being created, that helps us with our bets on where we put our IRAD at so that we're not trying to solve everything. We're solving your biggest problems and we're working with you. But I think for every business before you invest a dime, you have to have some path towards a return on investment.

Brig. Gen. Jason Bartolomei:





Of course.

Jon Norman:

And so it's a little bit of a change in the discussion of we want everybody give away all the IP and all the source code that you've created and then we'll compete that out to a mom and pop. It's nice in theory, but not realistic in principle because we must develop weapons that work the first time every time. And I know you have that and the team has that.

Brig. Gen. Jason Bartolomei:

So Storming, one thing that I correct is that the way that this has evolved and we need to make sure it's clear, is that what we want to do is preserve the IP where you've earned it.

Jon Norman:

Right, that's correct.

Brig. Gen. Jason Bartolomei:

So those ornaments are not intended to be produced by others because we want to protect that, but there's certain things that we think if we make open, what it does is it opens the ecosystem to what Ashley was describing. So I just wanted to make sure that we don't walk away with the idea that we want to upset that.

Jon Norman:

I'm not saying we're there today.

Brig. Gen. Jason Bartolomei:

But I'm going to come right back to you though, is that you brought up the importance of exportability. I kind of have a new phrase that I heard recently called itarability which is the first time I guess we could ability everything, right, Storming? But itarability, exportability. Can you talk a little bit about why that's important? And I think one of the things that you all have shown me is why we need to be thinking that from the get go, even in the open system architecture, in our government reference architecture, we need to have that in mind. Do you want to say anything more about that Storming and then the rest of the company?

Jon Norman:

I mean, ultimately it's the total sales volume from a company perspective that's going to give you a level of earnings. It's not going to be a high profit margin. And I think for all of our companies, we have to appreciate that we're not Apple, we're not SpaceX, you're not going to make 30 40% on the US taxpayer because we all pay taxes and we don't want to give away that kind of money. So it's going to be a much lower margin, but it's going to be the sales volume, which is at a finite level with the US government customer. So we're going to have foreign partners that if we make quality weapons, they're going to want to buy, they'll sell themselves. The profit margin typically is when those are past sunset and they're available on DCS. So that's far, far in the future and it's far beyond I think where any company CFO is going to focus. So I think for the near term, when you talk about and itarable weapon, if we design that in early on so that technology can be shared and that takes a close partnership with the Air Force or with whoever's contracting this weapon so that we design that in and with our SAF/IAs, we're able to



field that not just to our US forces, but in concert with our partners and our allies. I know they'll appreciate that and I know it helps our business.

Brig. Gen. Jason Bartolomei:

And so not only in the business case but the operational case. I mean, I think one of the things that you hit is equally as important is the ability for our partners to be able to use the same weapons because that has a great quality on battlefield. I think I see such a big audience of Airmen that come from the field and they're probably like, "This is not what I thought I was going to hear." They're like, "What? I thought we were going to talk something about something cool like weapons and we're talking about all these other things." So one of the things that I think for the Airmen in the field that are in this room, it's a kind of an interesting future and I want you all's reaction to it, is that when we talk about a more innovation friendly weapons inventory, I think it has big effects on how we sustain the weapons, how we deploy the weapons.

And I think for the Airmen in the field, we're going to have a much more interesting place because the weapons we're loading on our aircraft are going to be doing new and different things that Airmen at all levels of command have to be thinking about. And so one of the things that we're really trying to do is get the voice of the customer in early and having them help with us thinking about what does collaborative look like? What does AI and autonomy look like? What does having a mixed fleet of weapons look like and how do we actually figure out how to deployment? It's the Airmen in the room that are going to be at the front end of how we actually fix and do that. So starting with James and working our way across, from your perspective, talk to us a little bit about what you see for those future Airmen that are going to be fighting these weapons and kinds of things that come to your mind.

James McDonough:

Yeah, I mean the key thing, it gets the logistics right at the end as former war fighter when you have to go actually do things, you're going to have all this kit. So we got to make it easy on them. Our real key here and also hitting on the coalition point, that's why the software defined aspect is so critical because really you want the end product that's at the edge to be programmable for the mission you need and you can set it up if... Obviously, there's always going to be some IP and things that need to be protected, but we always fight as a coalition and we always have to be ready to do various missions. You never know exactly what the war is going to be. So you need that adaptability in the weapon system to both make it viable for our coalition partners, but also for the Airmen to then program it and get it ready to go in the field for the mission you need.

Brig. Gen. Jason Bartolomei:

Yeah, so I mean if I'm an Airman, I'm thinking about what I do with the weapons today. It's a little daunting, but boy, how interesting is it to be at the bleeding edge of updating a reprogrammable type of weapon that's going to do something when you launch it the next time that may or may not be the same as the first time. And how do we figure out the TTPs and how we're going to train for that and do that. It's the Airmen in the room here today listening to this one and choosing this speech above them all with this panel. Good job Airmen. But we need you guys to come in and help us think about that. Any thoughts, Ashley, and then Storming.

Ashley Brawner:

Just to pile on what James said, I mean I don't want to put words into Airman's mouth, but as we talk about working with our allies and across the different platforms, time to target is very important. And so



not only interoperability, but that interchangeability, which I think is very important and so that we can make sure that our war fighters able to do those switches to the fight that is at hand at this moment and it's very dynamic. So being ready there is very important.

Brig. Gen. Jason Bartolomei:

Great. And Storming last word.

Jon Norman:

Yeah, I look at the lifecycle cost and that design for our Airmen, and it's not just the aircrew that are employing these things. It goes all the way back to the Airmen that's working in the munition storage area. How well do we design the storage case for that so it can be moved and stacked and stored and inventoried? How difficult do we make it to reprogram that weapon? How difficult do we make it to replace a battery and to inspect the rocket motor to do any type of service on that seeker? Are we creating the right carriages that will support an Airman that's six foot five the same way that an Airman that's five foot two? Can we rotate that so that they can work on it? Are we making the tools required to service that weapon simple enough so that there's only two or three so that as you're going through your CTK, you don't have a tool chest full of tools just to service a single weapon? And it's that care that industry does that helps that lifecycle costs, it helps our Airmen and I think it helps our battlefield Airmen as we're trying to generate aircraft and generate sorties, do that faster so that we can respond to that advanced threat.

Brig. Gen. Jason Bartolomei:

All right, well, so before we break, I wanted to highlight a couple of key leaders that are in the audience like Sigrid. If you could raise your hand stand up. So Sigrid is representing the Chief Technology Office for the Weapons Enterprise. If you have cool ideas, you should find Sigrid because she might be standing near here at the end. Colonel Furman is SML. Stand up, Tim, if you got some ideas in Stand-in attack, you got some cool ideas of the next generation of stand-in attack. He's right there. Tracy Woodard, if you've got direct attack bombs, anything that you think you want to talk about with direct attack, he's your main man right there. I'll be sticking around, but also these panelists. So if we give these guys a round of applause, thank you for your time today and thank you AFA for hosting this important subjects.