



Brig. Gen. Dale R. White:

All right, well good morning. I am Brigadier General Dale White. I am the PEO for Fighters and Advanced Aircraft and welcome this morning. It's a great honor to be here thanks to AFA to allow me to do this and having my industry partners here with me. And so as Secretary Kendall recently stated, he's said China's intent on fielding a force that can conduct aggression in the Western Pacific and prevail in the United States is a real thing. And we're not guaranteed air dominance any longer like we once were. When we're asked to deter and fight inside great power competition, that means there are things we have to do to assure that air dominance. So one of the things I'll start with this morning is simply this, many of you're probably wondering why you have an acquisition, a career acquisition officer, program executive officer up here running the air dominance panel.

And I'll tell you why. General Richardson talked a little bit yesterday about the mechanics of the role AFMC plays and what we bring to that fight. But I will tell you, I stand shoulder to shoulder with my operators and how we design in the future capabilities. We acquired a fight and we acquire to win, and we do that standing shoulder to shoulder. The lines that once existed before are fading significantly. And so I stand next to General Job, General Harris, General Slife and others as we start designing the future force and getting capabilities into the field. And so, one of my key tools in doing that is my industry partnership, the industrial base we rely on, just like in World War II, we won because of the production capacity, our ability to energize our nation and our industrial base. And it's no different. It will be no different in the future.

And so with that, what I'm going to do is introduce some of the panel members. I'll have each one of you just kind of introduce yourself and say a few comments. And as we go into this, it's going to be a very dynamic discussion. Don't want it to be rigid. I want to give the audience what they came to hear and so this will be a bit dynamic. So if you could just introduce yourself maybe about two minutes and then we'll go from there and we'll roll right into the questions. So Jeff, I'll start with you.

Jeffrey Hoberg:

Yeah, sure. Jeff Hoberg from Albert America. I'm the general manager of our joint venture with Collins Vision Systems. That's through which we develop and produce all the fixed wing helmet mounted displays you see in the F-18, F-15, F-16, F-35, and hopefully here in the future on some of these future platforms that are in development today.

As we look at the state of the industrial base and really what we're seeing is a shift in defense towards facing that strategic threat. It's a big state of transition from fourth generation, fifth generation now to sixth generation capability that's requiring, or I should say it's driving new innovation and new ways of thinking things, which means new technologies and really an urgent need to update the industrial base of support. Both those new ways of doing things as well as the capacity needed, I think to face that emerging threat. But hey, I'm happy to be here. I'm looking forward to the discussion today to discuss those solutions and how we're positioning ourselves to be able to counter that.

Brig. Gen. Dale R. White:

Thanks, Jeff. Renee.

Renee Pasman:

So Renee Pasman, Vice President, integrated Systems, Lockheed Martin's Skunk Works, which is one of those useful job titles. That doesn't tell you what I do. That's a feature, not a bug. But one of the things that we've been working through for the last several years at this point is really getting ready or working that transformation. Part of that is technology, looking at different technologies, what's required, all



those types of things, but even more so how do we actually bring them together? How do we execute differently? How do we work differently to shrink the timeline that it takes to get capabilities out to the field and not just say, "Hey look, this is something really good," a quick demo, but really get it out there, have the capability, getting it all the way through test, and how can we best partner with our industry peers, with our government partners, to get the capabilities out there faster and to have more agility so that we don't have to figure out 10 years in advance what the right answer is, but we can respond much, much more quickly inside of the adversary's decision spaces.

Brig. Gen. Dale R. White:

Awesome. Thanks, Renee. Amy.

Amy Gowder:

Thank you, General White. Amy Gowder. I'm the President and CEO of GE Aerospace Defense and Systems business. So we have 26,000 engines in the field across rotary, tankers, trainer, mobility, and of course combat. In fact, GE did the first jet engine 80 years ago and we brought it to field very quickly back during World War II. So I think we need to go back to our roots for this conversation.

Brig. Gen. Dale R. White:

No, thank you very much, Amy. So I'm going to go, I think as you can imagine, we prepped for this so I'm going to go a little bit controversial early. And so forewarning you, so brace for impact. So recently Chief Brown at Lifecycle Industry Days, he gave a speech and I think many of you were there. And one of the comments he made during that speech was talking about breaking the mold. He used CCA as an example, but in breaking the mold, he talked about the relationship that our acquirers, our engineers, our designers and our operators and industry, how they partner together and how that is going to be foundational to the future of how we design the future force. So in my mind, and I think in his mind when he even had the speech, I'll be so bold, is to kind of speak for him a little bit in terms of what I believe he meant.

There's a culture piece to this, the culture of the partnership, whether it has eroded over the years as we've gone through the last 30 or 40 years, as opposed as we get ready for a high end future fight, is that culture there, number one. And number two, what do we got to do to get to that space where we are fighting as an integrated force, as an integrated nation because as we all know, militaries don't win wars, nations do. So do we have that culture? If not, what do we got to do to get there or what do we need to do to make it better? Renee, I'll start with you.

Renee Pasman:

Yeah, I think that culture is definitely there, but it's there in pockets. I think when we have a joint emergency to respond to, we always tend to come together very quickly. Or if there is an opportunity or a particularly driven customer leadership team or industry team, they can build that culture. I think an interesting question is how do we make sure that that is just the way we do business rather than an emergency response, and what can we set up to support that culture better? And also how do we change culture, which is a very difficult thing to do, especially when maybe that approach hasn't started there from the beginning. And I think there are things that between governments and industry we can do to make sure we're building that culture.

But there are also things that industry partners can do between each other to help build that culture more because I think once it starts, once you get kind of that collaboration going in a particular area, it can spread in some really interesting and sometimes really fast ways and you can be through the change



before you even half realize it, which becomes a whole problem in and of itself. But I think it exists in pockets. I think a really interesting question is how do we make sure it just becomes the norm rather than a special example that has to be protected, if you will, from the larger system.

Brig. Gen. Dale R. White:

Amy, I'll go to you next.

Amy Gowder:

Sure. So I think it starts with mindset and unfortunately we have some of the wrong mindsets. We have too much of an arm's length. We're going to judge each other based on did we meet this requirement? How is this price and costing data? So I think about Alpha contracting as much more collaborative and has a different mindset when we're trying to get the speed of what's done. So I think it comes down to we're all in the same fight. We're not against each other, but we're all in one team. And to Renee's point, that includes industry in GE, we've been trying to change the mindset because we believe in lean as a mindset and with lean, it is about going to Gemba at the point of impact, iterating doing an 80% solution. Our industry is full of engineers who are great designers, but sometimes we look for perfection out of the gate and really we're going to have to be more agile and rapid and get an 80% solution, then continue to iterate.

We've also changed the mindset with additive. Additive you design so I think technology, we've got to embrace a new way of thinking. An additive for GE has done that. It's how our designers think completely differently in design. So I think leveraging technology, leveraging culture, but really we've got to change our mindset.

Brig. Gen. Dale R. White:

Awesome. Jeff?

Jeffrey Hoberg:

Yeah, so I break down culture into really two pieces. One is staying motivated to the mission at hand, keeping and retaining our workforce and pushing through this transition time as we're talking about. And that's really maintaining that connection to the war fighter having a common cause. We're all in this together. It's the US, it's the nation. It's not just the war fighter in the industrial base. That's one piece.

The second piece on the cultural shift I think is doing things faster, being more agile, being able to support quicker, bringing those new technologies into the platforms at a more rapid pace, better, cheaper, faster. And really as we look at it's making that shift in mentality from being a hardware producer to being a software producer and thinking in those terms. So how do we do that? And we talk about the, coming from a slightly different perspective than my esteemed panelist here. As a supplier, we need to be part of that conversation. So both with the OEMs, with government, you want to enable this mindset for agile development, fast production capacity that includes things like open standards, that's including us in part of those discussions on what those solutions will be. I think we've made great strides in that respect of the last two years as frankly as the government and the military complex is better understanding how to approach this. But we need to continue making those strides.

Brig. Gen. Dale R. White:



No, I appreciate that. I'm going to do a little bit of a hard left turn and this is a question we didn't really rehearse, but I think it's an important one. So it makes... It's sporting because you guys get surprised by the question and fun for me and even the audience for that matter.

But as you think about, I fear we get into this rut where we're up here, we're saying the same things we've always said for every year as we get back together, we need to do things faster, we need to be more agile, we need to do all this stuff that's not new. We've needed to do these things forever, but there are attributes that feed into our ability to do that. And bear with me here for a second. Since Secretary Kendall has come in, I mean, it's very clear what his vision is.

He started yesterday saying the three words, China, China, China. So we have urgency here. We have a sense of urgency. And in his mind, I believe and in the chief's mind and Secretary Hunter's mind, in Joe Richard's mind, everybody who puts on the uniform or who comes to work either as a contractor, civilian or industry is a war fighter. They're in this fight. So when you think about air dominance, that is very much a... It's a heavy lift, it's a heavy term. So do we have right now, in your opinion, in dealing with your government counterparts, do we have the war fighter mindset? Do we have that war fighter mindset that's going to drive those things we talk so much about every single year? We need to go faster, we need to be more agile. So do we have the urgency and do we have that war fighter mindset? Have you seen a change just over the last several years? Renee, I'm going to start with you because I know we talk about this often and then we'll go from there.

Renee Pasman:

I get to go first. So I think the interesting thing is we definitely have that urgency mindset. It's come up. It'd be hard not to have the urgency mindset given the focus that it has had. To me, the interesting thing is to your point, it's really easy to be like, "Yes, we have a great urgency mindset and agility is important and flexibility is important and we should do all those things better." It's like, okay, what are we actually going to do that is different because try harder has rarely worked. There's a lot of teams, we've seen them all that have tried really, really hard, but they were always there. So what are we actually going to do differently? And I think some of the interesting things that we've seen there change across our portfolio in the last few years. One of them is when it comes to a level of risk acceptance, an informed risk acceptance, not saying, all right, we're just going to accept this risk.

We don't know any better. But bringing in all the people that might have to live with that risk acceptance so that their perspective is understood early on.

To Jeff's point, bringing in a larger cross-functional team both across industry and across the government so that when we say, "Hey, we're going to do tests differently," what does that actually mean? How does that work? And so, one of the things I often tell my teams is try harder rarely works. We have to try different. And one of the first indications that you're actually trying different is that you're talking to people you don't normally talk to. And so whether that is all of a sudden there's a different part of your customer that is showing up to your meeting because the PEO is bringing the test people in early or something like that, or whether it is because, well, I've never talked to that supplier at this point in my conversation before, but now they're in your meetings all of a sudden that's usually one of the first indications that you're actually trying to do something different, which gives you the opportunity than a hope for a different outcome to actually get more agile, to actually get faster.

And I think we've seen a lot of progress there over the last few years, whether that is in the collaborations within industry, some of the consortium activities or whether it is within the government as well. But to me that's always one of the key things of that's how it's really easy to sit up here and say, "Hey, we should be more agile, we should go faster, whatever." It's a lot harder to actually start doing,



and that's been one of the key things is all right, are we actually talking about different things with different people so that we can make different decisions that lead to a different outcome?

Brig. Gen. Dale R. White:

What can the government do to facilitate that you think?

Renee Pasman:

So I think there's a lot of things certainly continuing to set that expectation is key. I also think that there's ways to drive those collaborations. There's a lot of, I think and general Richardson's comments yesterday were a great example of how the centers are all working together in a cross-functional team. And so making sure that that is the expectation from a government perspective that it's put on the industry partners, I think that's key. And then there's always the types of things from contracting and things like that that make that a little bit easier. But I think a lot of it starts with expectation setting. Just like Secretary Kendall has set that expectation around urgency and the focus, making sure that we're all on the same page of it isn't just, "Hey, we're going to try harder," but we're actually going to try different, we're actually going to change. I think it's also really powerful.

Change is always great to encourage someone else to do. Change is very hard to say, "I am going to change like this." And so as oddly enough as the government makes it more clear how they are changing internally, I think it puts the onus back on industry to make sure we're not just saying, "Hey government, here's how you should change," but for us to actually explain how we are changing as well. And that's I think how you pull things together, whether it's on brand new programs or existing programs.

Brig. Gen. Dale R. White:

Yeah, Amy.

Amy Gowder:

So I'm going to be controversial.

Brig. Gen. Dale R. White:

All right, I like it.

Amy Gowder:

So, no we don't have the war fighter mindset. We're arguing over data rights. So I think that's a really good example of how we as an industry and we, the government need to come together and understand if we had a war fighter mindset, we would understand what do we need to be organically capable? What do we need to have a second source if there needs to be a surge come in all about readiness? And I think we go to these extremes. The government wants all the data they possibly can have and they won't even use it, and industry wants to protect all of it and don't want to give up any. And I think if we had a war fighter mindset, we would learn to collaborate better. And this is what Renee is talking about in testing and collaboration and requirements. So I would say no, we still have a ways to go.

Brig. Gen. Dale R. White:

The data rights issue is always fun to talk about, literally always fun to talk about. But one of the things, it's one those discussions to your point Renee, where you have to sit down and say, "This is what I'm



trying to do," and then we talk about, well, this is what we think you need based on what you're trying to do versus the swinging pendulum back and forth. And I think we're getting there. I've seen that in pockets and I think it will spread. Jeff, anything to add from your perspective?

Jeffrey Hoberg:

Yeah, I mean just, again, from a supplier perspective, some of the ship that we saw early on was really a requirement for higher TRL hardware that we can insert quickly into the various platforms. And initially that came across is, well, we just want what's off the shelf. Well, instead of starting with that, how about a couple of years before, year before give us the requirements so we can build to that capability. The funding piece will sort itself out, but let us be part of that conversation before you get to that point as opposed to waving there. Now again, I think we're in this kind of period of transition. I think some of the discussions about how do we make this happen? I think digital modeling is one of the phrases of choice today, but enabling open standards, communicating what those open standards are, I look at things like cybersecurity that frankly take years to [inaudible 00:18:13].

Brig. Gen. Dale R. White:

I'm going to shift to that here for a minute because I think this is critically important. I'm a huge fan of bringing industry in with their operational analysis because I want to know if I have something wrong. And so operational analysis is that data that's going to tell us whether or not we're on the right path. And we don't always have to agree on what that analysis tells us, but we have to use it as a guide for at least the conversation of what we need to go do. So that as a backdrop, going back to the air dominance, tactically speaking, what do you think those technologies are, as much as you can say in this environment, understandable, what do you think those technologies, strategies or approaches are that's going to help us capture that air dominance and that future force design and that future fight? And so Jeff, I'll start with you on this one.

Jeffrey Hoberg:

Yeah, so again, I looked at fifth gen, fourth gen, fifth gen capability is really building on speed and stealth. And as you look at six gen, I view that as information management. And it's funny thinking about a war fighter as really being a data manager, but they've got so much or they will have so much information available to them that the workload is unbelievable. They need to be able to absorb that information and act on that and to bring that information. I think you need critical new technologies and off port sensor capability linking that information, new sensor suites AI to be able to help manage that load. And fundamentally at the end of all of it's the displays themselves and the avionics within the aircraft. Of course the platforms are important too, don't get me wrong, but that display and that pilot vehicle interface is going to be critical for managing that information. And it's not just a TV in the cockpit or dials and displays anymore. It's integrated concepts that include the displays, the helmet mounted displays, and using new and informative symbology sets that allows the aircrew again to be able to absorb that information and make quick decisions.

But I think it's really a combination of all those factors. Again, not withstanding some of the other critical platform capabilities that need to come along with it.

Brig. Gen. Dale R. White:

Amy, thoughts from your perspective?

Amy Gowder:



Sure. So I think we in GE see three things that are really important. First is obviously it's time for the next generation of propulsion. We're here, it's ready, that architecture's ready to go and it can provide the speed, the range, the thrust that's going to be needed in a contested environment.

Second, materials are making a lot of advancements and so we see hypersonics leveraging those new materials and technologies for higher temperature applications as well as of course the new materials going into what's needed for ramjets, scramjets and rotating deck.

And then the next is power management. So all of these avionics and advanced mission systems have a lot of heat and so we need more cooling and we need better power management and there's been advances. GE's worked on silicon carbide that can allow that high voltage, lower weight, lower cost technology. So I think material science is really advancing us and we've got to take advantage of it.

Brig. Gen. Dale R. White:

Renee.

Renee Pasman:

So I think the interesting perspective from Lockheed Martin's portfolio with how broad and how deep it is, we see all of those things. We see a lot of the [inaudible 00:22:12] software and avionics and capabilities. We see a lot of the technologies from just a pure platform and kind of the physical elements of it. When we look at key technologies, and especially when you think about the fifth gen capability that for example F35 represents already a significant capacity and capability in terms of all of those data elements, stealth speed, all those, what's next? How can you do better? One of the interesting things is starting to your point with the war fighter in mind. So I put myself or our ops analysis people put themselves in that cockpit, in that highly contested environment. What do we need to be able to do that? A lot of that is how do we make the data, how do we get the right data, how do we get the data that need to have decisions made and how does that data get trusted? So there's a lot of elements there.

Then to Amy's point, there are key capabilities in terms of actually getting the platforms there because with all due respect to mission systems and avionics boxes without an airplane is boxes sitting on a runway, that doesn't help anyone from a tactical air dominance perspective, but getting all of the how do we make sure that we have growth there? And the interesting thing there is we've been able to show upgrade paths, but how do we do that quickly and rapidly without necessarily knowing what the initial capability is perhaps? So how do we build in extra margin without having it be consumed right from the get-go? So there's I think a lot of capabilities there just in compute and software and all the various other elements.

And then I think the other really interesting thing, and to me what truly defines next generation capability is recognizing that you're not out there alone and unafraid, that you truly are part of an integrated war fighting force, whether that includes US forces or our allies. And so making sure that both the technologies are there as well as the ability to use those technologies to really integrate at the tip of the spear at the edge, maybe in a configuration that we weren't expecting, but that is the right thing for the war fighter at that point of time and what are the key technologies there. And I think that's where you get into, yes, a lot of technology development but also things like policy that can really unlock capabilities in the future.

Brig. Gen. Dale R. White:

No, that's awesome.





So pulling the thread on the strategy piece just for a little bit longer, I think everyone, General Hawkins and General [inaudible 00:24:41] and General Miller would be upset if I didn't talk about from a strategy perspective. I think one of the biggest challenges we're going to have is the readiness piece, the logistics piece a little bit. So pulling on that strategy a little bit, what do you think... We're constantly trying to figure this piece out. What are we doing? What is industry doing thinking about this readiness piece because I think it is a different challenge when you think about the path that we're on and what that future fight looks like from a technology perspective, what things do you think we're doing to prepare for greater readiness and even for the ability to iterate a little bit more? And when you think about this, I know we've had discussion with a few of you on this point is how much technology is too much where it becomes a readiness challenge? When you think about, I've said this numerous times, as complexity increases speed to ramp goes down. And so as you balance that from a readiness perspective, what is industry doing from a technology piece that's going to allow us to be able to address the readiness aspects of what we think is going to happen in a future fight? So Amy, I'll start with you.

Amy Gowder:

So I think of two things. I think of data and I think of capacity. And so on the data side, because of the advances in analytic tool sets, I think we really can be smarter about how we position supply and do repairs and understand that we can optimize the readiness and I think that's... An example, we've made some strides in that with advanced analytics and condition-based maintenance. But I think we can do more I think, and we're going to have to do more in order to take the precious resources we have and make sure they're occupied, but we also have to increase capacity.

So I see, and certainly COVID has hurt capacity clearly in the supply base. And so as we think about capacity, we at GE think of it in two ways. We think of it with lean, first of all, just really truly optimizing your flow and optimizing the use of the capacity you have. But then secondly, it is about a step function change using technology, whether that's advanced machining capabilities or more automation to increase the capacity. But those are the two things I think that we as a collective industry and government have to collaborate on, the use of the data to be smart about our supply and then secondly, really optimize the right number of capacity to surge when we need to surge and maintain readiness.

Brig. Gen. Dale R. White:

Renee taking, pulling the thread on that, future platforms, current platforms, obviously Lockheed Martin has a bigger role in all of those. What do we do as we again think about that logistics under fire kind of concept and making sure we have organic capability and making sure we have Multi-Capable Airmen that can actually do some of these things? What are we doing to be able to address that?

Renee Pasman:

Yeah, I think so there's the readiness from a war fighter perspective and really that support in the field and whether it's support for things like agile combat operations, really thinking through what is needed to do that and ensuring those are incorporated from the beginning and recognizing that agile combat operations probably also means that there isn't a single set of requirements because they may change that whole point of agile again.

Also, I think recognizing that to your point about multirole Airmen and making sure that we make it easier, that we're not always looking for that artisan, that person who can do one part of the job, which is also something that translates to our own workforces as we think about everything from work instructions to the floor to how do we leverage that information to make it easier to be more ready or





increase readiness even early for our new system so that we're not waiting for tech orders or things like that to get developed.

And then there's also, I think an interesting point, we talk a lot about technology and how we can use data analytics and have that just in time mindset, but I think here's a really interesting example of how the military use case or the DOD use case is slightly different than commercial because as you get more and more into that just in time mindset and everything is perfectly managed if you will, what happens when something goes wrong because it's one thing for a car factory or a car company to take their factory down for a day because of some maintenance upgrades to their IT system. It is quite a different thing for either an industry partner to have to take its capacity down, especially in a war fighting scenario, or worse yet for the war fighter in the field to not be able to deliver capabilities. So I think there's a lot of lessons learned and things that Lockheed and its partners are working through as we look at how that was done for fifth gen, that really I think inform us on how to not just have an agile capability but also a robust capability in the field.

Everything from what are the key technologies that I need to just, how do I condition the data and how do I make sure that data is useful so that we can respond and be ready and have that be a robust capability as well.

Brig. Gen. Dale R. White:

Yeah, so the multirole Airmen approach, I've already seen some of this in industry, right Renee, and we've had this conversation, we're already watching it happen and I know there's a lot of Airmen in the audience and they deal every day with the challenges of being locked, whether you call it vendor lock or not having. So as you think about what technology has done to allow the multirole Airmen concept inside industry, which we've seen. Is that exportable into the government to increase readiness and allow us to control our own destiny.

Renee Pasman:

So I think one of the really interesting things that we've seen, and we talk a lot about digital, and again, it's easy to sit up here and talk about digital, but what does this actually mean to our workforce, be it our industry workforce or the Airmen out in the field? And to me, one of the fascinating things is yes, it's a lot of software development and those are key skills, but in the end things have to come down to a physical element. And I think in some cases we have over just a development of fifth gen and time gotten into this very specialized job codes. And one of the things that we've seen across a couple of our Skunk Works programs at this point is the ability for some of the digital technologies to actually make it easier to turn that into back into more of a generalist.

And I think we've seen some great benefit there to where we can take people who maybe they were trained to do wiring installs, but now they can do wiring installs, structural installs, subsystem repair, all those types of things. And so I think as we understand that better, we understand how you empower and enable people to do that. I definitely think that that is also exportable to the Airmen because if you think about the work instructions and how those can get translated to tech orders to where... I always think it's really interesting, we've all gotten so used to in our personal lives, you get a smart speaker from Google or Alexa and your entire training is one little card that says download the app to your phone and now you can use the smartest AI you've ever interacted with. And yet in order to repair a piece of hardware, you have to go through six years of training and then three years of this and four years.

It's like how do we take some of the things that we've all gotten used to in our personal lives and now start to apply that to the workplace? We've seen some really good improvements there or some really



good change there in some of the things that we're doing and I think that it definitely sets the path also for how we can do that from a talent management perspective for the Airmen, which also includes, by the way, things like apprenticeships because again, there is certainly we want to make it easy, but there also is an element of making sure that people have the skills that they need and that isn't just, "Hey, go get a software degree." There is also a lot of the tangible, how do I actually make this real hardware, metal and composites that can go deliver capability in an actual fight?

Brig. Gen. Dale R. White:

No, great points. I think we convinced ourselves our problems are bigger than the everyday problems that we have already overcome in our lives, but we have to make that transition.

So Jeff, I'm going to go to you here for a second. So going along those same lines, I don't think there's anyone that's sitting on this stage, including myself, who's standing by the way, that hasn't seen the challenges associated with the workforce and what it takes to maintain and sustain the workforce required to do this, this productionization of both technology and capability to our operators. So what would you say, I'll start with you, what would you say you are doing to attract and retain talent? And frankly, what are you doing differently if you think to Renee's point about the more generalist in terms of capability, because I think you are constrained with who you can choose from now and the competition just amongst the three of you is significant. And then you throw me in the mix as well trying to get our fair share. So what are you doing each one of you, what are you doing to attract and retain?

Jeffrey Hoberg:

Yeah, and I throw in the competition between us for that same talent. It's not just here on the stage, but it's within the commercial sector as well. And that frankly, that's where the majority of the competition is from. It goes back to one of our first points, which is maintaining that connection with the war fighter and having a common cause, building a culture that supports that. I think the generalist versus the subject matter expert. I think that's an important conversation, identifying who wants to be a generalist, who wants to be a subject matter expert, but understanding within that context what you need those specialists for and what you need your generalists for. So where can we replace that very bleeding edge technology with lower cost, easier to produce technology? I think that's an important consideration within the context of all this us, but really in my mind, the retainment and the building of a workforce that competes against the commercial sector is keeping them engaged is again, we're all fighting for the same cause and maintaining that cultural balance that keeps us focused on not really what industry is providing to government, but we're saving lives and providing lethal solutions for the end war fighter.

Brig. Gen. Dale R. White:

Yeah. Amy, what about with you GE? I know you're right there near Dayton.

Amy Gowder:

Yeah, so GE, our mission is we invent the future flight, lift people up and bring them home safely. And that does resonate with the mission and we have a lot of GE employees who feel like they're on the war fighter side developing the technology they need. So that's the first hook you get them in, but that's not everything you need to retain them. And so we found once you get them in, they still expect a level of investment in them in terms of training, and that may take the form of an apprenticeship or we actually have a military leadership officers program where we hire former military officers and then bring them through a training and a rotation program so they learn industry so that they feel invested in. And then it's that continuous improvement, continuous learning culture frankly is really what retains them. But I



think we all have to do our part, General White to go further into the education system to ensure we have that pipeline, those STEM education, otherwise we're all going to have a continued shortage. So I think we need to do more in these technical programs, making the technical fields attractive all the way back into elementary school.

Brig. Gen. Dale R. White:

And I got this question the other day, and it's been proliferating I think for a while inside the industry base. Do you think from your perspective, especially where you're at? You have so many colleges to draw from, right there, we were just talking about this two minutes ago. Is it always going to be an engineering degree or is it going to be some of those technical schools where you can build the generalist that Renee talks about? And maybe the requirement isn't a five year, six year tenure engineering program wherever we end up with, I mean...

Amy Gowder:

Yeah, I feel pretty strongly about this one. I think we have over-indexed on college in general in this country, and I think people can do technical apprenticeship programs and especially with advanced technologies like additive and advanced machining, we can get them in. And what we've seen when I was with Lockheed Martin and we engaged in a community college program, many of them came into the workforce and then we went on to get them college degrees. And it doesn't always have to be technical. I think we're looking for learning aptitude. They do have to have some STEM background to be effective, but I really think we've got to balance college degrees with a technical...

Brig. Gen. Dale R. White:

It becomes a capacity discussion, right?

Amy Gowder:

Yep.

Brig. Gen. Dale R. White:

Renee.

Renee Pasman:

Yeah, absolutely. And I think, so to Amy's point, I think it's not an either or, it's a balance. We need some people with college degrees and backgrounds, but we need, and arguably in some cases, a lot more people who are there to get their hands dirty. And also the two categories are not necessarily exclusive. It can be both. I think some of the best engineers and other career professionals that we have, to Amy's point maybe didn't start that way, but have a sincere and distinct appreciation for what it actually means to try and maintain a thing in non-optimum conditions because they had that experience, they were there and they value that experience and they want to bring it in. I also think that there is a broader categorization even. It's not just a STEM degree, but certainly, yeah, if someone wants to go do a bunch of AI research, that's probably very helpful.

But maybe for some language learning type of models, maybe the STEM degree isn't what you're looking for. Maybe what it's more is a good understanding of English and how it is supposed to be working. So I think there's really that very broad base. Where it comes back to, I think is that connection to the mission, and I think sometimes, and even more importantly, everyone wants to understand that



their work matters, that they're not just a cog in the machine. And so I think the more that we can make that clear, that is what helps to retain people. I also, and this will be my slightly controversial statement, I think particularly in industry, we have to be a little bit more prepared for people to want to change jobs. Whether that is within a discipline or whether that is within industry partners or geographical locations or even completely outside of industry.

That is a thing that this idea that everyone is just going to be there for 30, 40 years because it's very stable and nothing ever changes. That's not the world we live in anymore. And so from an industry perspective, we have to update our talent management and retention policies with that in mind. Is the point pure retention or is the point ensuring that we don't lose any speed or we don't lose any knowledge as the workforce changes, because if we change everything but that it still won't work because in order for one thing to change, as you've said, sir, everything has to change.

Brig. Gen. Dale R. White:

Needs to change. Yeah. No, absolutely.

So we got just a few seconds left, and what I'm going to do, I'm going to put you on the clock, the speed round, 30 seconds each. So when you think about what does the single greatest challenge industry faces in the next three to five years, and when I say industry, I say industry as its role as my operational partner to go out and win the fight for the nation. What keeps you up at night? I know you wear an industry badge, but I also know you're great Americans, and I believe in my heart of hearts, you all are in the fight with us. So Jeff, 30 seconds, what do you got?

Jeffrey Hoberg:

No, I think I'm confident in our war fighter base. I'm confident in our industrial base to be able to meet those challenges. I think the greatest challenge we face today is the global supply chain, keeping the parts coming, ensuring that we can leverage that global supply chain and frankly, including our global partners as well.

Brig. Gen. Dale R. White:

Renee.

Renee Pasman:

The new normal. We all sit here and think, well, when things go back to normal. This is the new normal, and the faster we accept that and can figure out how to deal with it, the better off we'll be. And then recognize, as soon as we accept that new normal, something else will change. So it is that environment of continuous change.

Brig. Gen. Dale R. White:

Amy.

Amy Gowder:

Mine's similar. We're in a great time of transformation, technology transformation, social transformation, led by the pandemic. So can we change our mindset and adapt to it?

Brig. Gen. Dale R. White:



Okay. Well first of all, for those in the audience, I think it goes without saying, everyone in this room, everyone listening online has a responsibility in this fight. It's going to be an all-in situation in terms of just deterrent or just building the future force we need to deter. And I think that's critically important. And so from that perspective, I appreciate all the partners I have here from industry and all the partners I have in the room. So just a round of applause for our guests.