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Moderator: Good morning, everybody. Welcome to this Defense Writers Group which I know will be a very interesting conversation. We're honored to have Matt Schlueter who's BCG's Global Head of Defense and Security to talk about this really compelling report, and thanks to Claude and his team for helping us get a scoop on the Munich Security Conference by releasing it here.

Ground rules, as always this is on the record. Please feel free to record for accuracy of quotes, but there's no rebroadcast of audio or video.

I'll ask the first question, as always, then we'll go around the table. We have an hour. I'll give Matt the final few minutes for any closing thoughts he wants to share.

But to kind of kick it off, I'm sure everybody's read the report, scanned it. We're not as fluent in it as you are. So Matt, take a couple of minutes, if you would, and give us what you think are the top lines that you'll be presenting at the Munich Security Conference, the major takeaways.

Mr. Schlueter: Wonderful. Thank you, Thom, I'd be happy to.

I also want to introduce my colleague, Lauren Mayer sitting next to me, co-author for this, who'll be helping through this session.

Let me just start by saying it's a pleasure to be with you. I really appreciate the time this morning. Innovation is something that we've been partnering with the Munich Security Conference for about four years now. And maybe I'll just take a moment to set the context for what drove this.

Four years ago if you'd asked the question about innovation defense, what would you hear? You'd hear a lot of people say oh, we're getting better at innovation. They'd say we just hired a new Chief Innovation Officer. Or my favorite, we just

took a visit to Silicon Valley. Or we just invested this much in one capability. So you'd hear all these one-off anecdotes. But when you say, how do you really know you're getting better? People would sit back and say I don't know. So that's where we started.

So BCG for the last 20 years now has actually looked at the most innovative companies on the industry side, and we said wouldn't it be interesting if we take that and apply it to defense ministries. So that's what we did starting four years ago.

When we say defense innovation readiness what we mean are what are all the dimensions that enable the top innovators? So it's not about specific technologies. It's actually about do you have the right portfolios? Do you have the right innovation processes? Do you have the right innovation talent, the right innovation governance? All the things that make innovators really strong.

The first year we did it we were able to get a baseline, actually quantify readiness which was interesting. Every year we've now surveyed over 60 ministries of defense. We've also surveyed NATO directly, the EU, some other entities. We've coupled that with interviews, expert interviews, about 30 each year. And that's given us our results.

What's interesting is we got to this year, many people around the table we could talk to it. What you're going to say is oh, the barriers to innovation. It's all about there's not enough funding. Or the procurement process is broken. Or it's all a talent issue.

That's all fine and those are important, but this year when we got into it it was very interesting because a number of people came to us and said you know what? There's things we wish people were talking about more. Things we call the unspoken barriers. And that's what emerges here with the six unspoken barriers to defense innovation.

I'll maybe quickly tick through them if that's all right, and then we can open up to the floor.

I think it's really interesting, the first one was around missing out on affordability, and we can get into all the details, but when you hear from a lot of people it's oh, we

don't have enough money for affordability. When you actually look at the top innovators, they actually use innovation to save money or to invest in capabilities that actually give them more money that can be reinvested. That was one.

I think a second piece is around over-investing in large complex platforms. So there is a platform issue, and we can talk about that. But when you look at things like affordable mass and the scale that comes with that, there's an alternative option that might be much more beneficial for ministries.

A third one is around under-utilizing AI's potential. So I'm sure we'll talk this morning about AI. There's a lot of discussion about that. You see a lot of AI investments in operational capabilities. Not so many actually into business capabilities and actually ministries run more efficiently and saving money that way. Some of the research we've found to the tune of $34 billion just for the G7 countries alone is what they would save if they could reinvest in further innovation, if they invested in AI in their business processes.

The fourth one, I'm sure we'll get into the industrial base, but overlooking some of the changes in the industrial base is one thing we've seen.

Fifth one, failing to adopt the lessons from recent conflicts. That's going to happen this week at MSC. I can promise you there's going to be a ton of discussion about look at all these things that have happened. Look what we've learned from Ukraine. Look what we're learning from the Middle East. Where you actually say okay, we hear the talk. Have you actually implemented it? What you find is most people aren't actually implementing the lessons learned.

The last barrier that was unspoken this year that people wished we were speaking more about is around misunderstanding the known barriers. So even to those first ones I teed up around talent and funding and so forth, what you'll find is there's other perspectives on that that aren't being talked about as much.

So that was the context, that was the focus for this year's discussion. And then we welcome obviously the opportunity to get into any questions that we want to talk about.

Moderator: Thanks. I'll use the power of the chair to ask the

first one.

On the small and insignificant topic of AI, it's so interesting because, again, reporters around this table, they write with wisdom about it, but so much of the stuff out there is either, it's Terminator, it's going to destroy our existence, or it's the magic bullet that will solve every problem.

In this context, talk about what barriers need to be overcome. You talked about invested properly, saves money. What does that look like exactly?

Mr. Schlueter: I'd offer maybe two considerations on the adoption of AI. The first is there is just a risk aversion that militaries need to get to the right balance. So it shouldn't be risk aversion, it should be risk balance. And there's not a full appreciation. You know, you can see some ministries are talking about responsible AI, what does that look like in the respective ministries, but there's not a full definition or full appreciation for what that should look like. So there's the risk balance that I think is the first piece.

The second piece is what we call around the digital upscaling or digital talent. There's still a lack of appreciation of some leaders about how this capability can be used, how it should be used. So you just offered two ends of the spectrum. There's a lot of space in between, but there's not a full appreciation by many of the leaders about what that should look like.

I'll give one anecdote which I thought was really powerful. When you look at what the UK did, typically when AI comes up a lot of people say oh, let's get our tech folks in here. Let's get the techies to talk about AI. What the UK did is they put their whole senior leadership team, all the operators, the senior military leadership, through a digital upscaling to say hey, you understand what happens on the battlefield. You have perspective around how things are evolving. Now we're going to give you some additional training especially around AI to understand how the two can come together. It's really powerful, versus pushing it down to the lower levels, to actually start it at the top of the leadership and went from there.

Moderator: As far as a narrative, the public doesn't know that AI is already on the battlefield. I mean like the Patriots that we sent to Ukraine and use elsewhere. They're sensing and

targeting automatically has some AI because no human can do it fast enough. That's just something that I've always found interesting. Governments don't even explain it right.

Mr. Schlueter: I think that's fair. But if I can offer one stat that I think is interesting when you talk about AI, maybe we'll talk about GenAI for the moment. Stats that came from the survey again, 60 ministries of defense. Forty percent of experts agree that GenAI is a valuable tool, but only 7 percent report implementing it, which is much less than you see in the private sector.

Moderator: Questions from the floor?

DWG: Good morning. I'm Josh Rogin with the Washington Post. Thanks so much.

I guess most of this was prepared before the new administration came in, but I'm wondering if you can sort of flag what you've learned here, what you see now with the new administration, and from what you can tell from the personnel, what their approach is to a lot of these issues, how it might be different than the last administration saw it? What are the good things that you see already, what we see from the new team, and what are the concerns.

Mr. Schlueter: Thanks, Josh, for the question.

It's interesting, having done this four years now we haven't seen a couple of different administrations, but we've seen different governments, we've seen policy change and so forth. And we've seen how the different ministries have reacted to that.

What I would offer here is every administration is going to have their policies and so forth. What the innovation readiness really focuses on, on how the enterprise responds.

So what's interesting is, and this is a big finding last year, actually, if you look at the data last year, it was something upwards of 90 percent administrations were talking about innovation, and 90 percent would say we have some policies in place or we have processes and procedures in place to support innovation. But only 10 percent, one out of every ten, were actually implementing them. So you have 90 percent of people

talking about it, but when you actually step back and say are the incentives in place? Is the context in place? Behaviors in place for the people on the ground to actually execute this? Only one in ten were actually doing it.

So regardless of the intent, it's not about the strategic intent, the ambition, the guidance from senior leadership. The issue is a lot of times people on the ground aren't hearing it and not implementing it.

So it remains to be seen if that will happen in this administration or not. At least historically that's been the trend.

DWG: Let me put it this way then. What are the thing the new administration could do to remove some of these barriers and help industry? Is there a wish list of four or five things that you would want to see out of the new administration?

Mr. Schlueter: I'll offer, first off, and it's interesting because there's going to be another announcement this week about rapid prototyping in acquisition and so forth. There are a lot of those things already in place. What you need is the contracting officers and the people on the ground to actually use them. There's a gross lack of awareness of people in terms of what actually authorities exist and what they can already do. That's one. I think even the administration driving and saying you have the authorities to do this, this is what we expect. Setting expectations around speed, cost and so forth.

On the cost one, that's the second one I'll offer, there is a cost escalation mindset that many people in the government have right now. They expect every time I buy something new it's going to cost more. That is opposite of what you see from the top innovators in industry. And it's a mindset I think this administration has already started to signal those things, obviously. I think they can really push that with a lot of people on the ground saying I'm not going to accept that we're going to have higher and higher costs every time we buy something. We need to start getting more affordability.

The third one I'll offer, there is a different relationship with industry that can be developed which would be much more beneficial.

DWG: How so?

Mr. Schlueter: And in particular I started [inaudible] earlier around affordable mass. So what you have is you have a whole segment of the defense industry right now, that right now private sector is investing $8 billion a year. Estimates are they'll be investing $20 billion a year in the next ten years into affordable mass. So it's smaller, scalable, interconnected systems that are more affordable and can be deployed much more quickly. Typically they're between about $100,000 up to $10 million, but they are not the big, exquisite systems that take ten years to develop. Affordable mass is a place that if the U.S. can really push forward in that and really invest there, I think it will be a really significant development on the innovation side.

Moderator: Is that like the Replicator program? Or is that --

Mr. Schlueter: That's a good example. Replicator is an example. A lot of the investments in drones and so forth.

Moderator: I guess the question there is whether Kath Hicks' dream will be continued by the new administration, and I guess we'll have to just watch that space.

Mr. Schlueter: I think we'll have to watch and see.

Lauren, anything to add on that?

Ms. Mayer: I think the only thing I would add with this idea of a cost escalation mindset is also looking at innovation not just as a way to get new capabilities for a more and more affordable cost, but also using innovation to drive down costs.

So one thing you see with those exquisite platforms that Matt was talking about is 60 to 90 percent of the total cost of that system is actually going to come in sustainment and maintenance and can we use innovation for something like predicted maintenance to help drive down the cost in the long term. Not when you're just buying something, but also when you look at those costs in the long time. These platforms last for 25, 30, 40 years and where can you drive affordability using innovation?

DWG: Lauren Williams with Defense One.

I want to kind of follow up on the cost part because I thought something interesting in your report was there was the lack of consideration for sustainment costs. Can you say more about that? You're talking about buying thousands of drones, talking about Replicator. You know, there is a sustainment portion to that even if it might look different than sustaining like an F-35.

Mr. Schlueter: I think, Lauren, you teed it up well in terms of, and Lauren -- Lauren and Lauren -- I appreciate the question.

To Lauren Mayer's point, a significant portion of cost is in sustainment. An interesting fact on this one, though, that I think starts to get to the issue, we asked the question around when you're on the front end of an innovation, do you consider sustainment costs? And what we found was only 43 percent of respondents accurately account for TCO, the tocal cost of ownership, and the idea of validation.

So a lot of people are saying hey, let me put the new unique thing out there, and they're not even considering when they're doing that what will it cost in the long term and how do we start to make decisions more early on that might impact the affordability of this program over the long term? So a lot of it's pulling it forward into the initial design to have a better understanding of what's a sustainment cost and what it could be.

DWG: And that causes them to miscalculate how affordable it is in the long term? Or --

Mr. Schlueter: Unfortunately, they aren't even calculating what is the long term. They're just realizing, very reactive to the cost in the long term, which is problematic.

The other piece I'd just offer about the affordability here is, that's again back to affordable mass, open system architecture and so forth. It's so important, because the more open systems are you can compete and you can bring in more affordable solutions. When you have IP, vendor lock and so forth on the front end, it's very difficult to control the costs in the out years.

DWG: Jeff Seldin from VOA.

I'm curious, maybe about 10 or 15 years ago we heard a lot from government agencies about [inaudible] because you could not fail. Any project that you started, any innovation you wanted to pursue, it has to succeed. And if you had, if you were testing a rocket and it blew up on the pad and didn't go up, that was seen as a failure.

How would you look at failure? How is that being built in? Especially with the innovation coming out of AI? Is failure acceptable? You hear a lot of [inaudible] now, grow fast, break things. But is there an acceptance or an understanding of how to do that well?

DWG: Thank you, Jeff, for the question.

I would just offer very directly, not nearly where it needs to be. And this actually goes back to the question about what can the administration do differently going forward? We asked the question of a lot of the experts and said hey, have you ever been promoted for failing at something? Across board, of course not. No one wants to put that on their OPR in the military. No one wants to put that and say yes, we tried really hard at this, we failed fast, we learned fast, and then we went on. That's still not in the mindset of people on the ground.

So again, the talk is going to be there. Everyone's going to say let's do it this way. Let's do it like you see with the top innovators. But on the ground people are not being rewarded for two things. One is for failing, recognizing it, learning and moving on. The other thing that you're not getting recognized for is for canceling programs. Again, we'll see if that changes in this next administration. You see a lot of new start programs, you don't see a lot of programs that are stopped, so it's related.

DWG: Are there any examples where failure has been built in so that it works well?

Ms. Mayer: I think one example I would give is in the private sector, what you see is it's often taken as a portfolio approach. Where within different innovation sectors, within a private sector company they'll look at, and they really evaluate across and say well, I had 70 percent of my funding went towards sure bets, things that went well; but I have 20 percent that maybe failed, and 10 percent that went to moon shots that were

successful. And they really make sure year over year at the head, usually a vice president of innovation will look at it and make sure that the company as a whole, across the portfolio, is making sure that they have some failure. It needs to be built into the system.

Mr. Schlueter: That's a great point, but we aren't seeing that in the ministries.

Ms. Mayer: No.

Mr. Schlueter: I love the point. It's exactly right. But have we seen it in the ministries? I don't think we have in the research, right?

Ms. Mayer: No. We have to look to the private sector for that example.

DWG: Steve Trimble with Aviation Week.

It was towards the end of the report, the point about portfolios, unwieldy portfolios, and then the recommendation of sort of to consolidate some of these platform programs that are redundant or there's multiple different programs trying to all do the same thing across the NATO enterprise. That sort of thing.

I guess the other flip side of that is if you consolidate, you lose competition, and competition is also innovation. Plus the more you, looking at the fighter jet programs, GCAP and FCAS, say if Europe were to consolidate that, they might eventually at some point -- just think of the unwieldiness of a governmental structure involved in that, with France and Germany joining UK and Japan, maybe Saudi Arabia. It gets even [inaudible].

How do you balance that innovation from just not investing in several different programs while trying to [inaudible], but also trying innovation and keep the governance under control?

Mr. Schlueter: Thank you for the question. Maybe a couple of thoughts. Lauren, I know we have some data on it as well.

When we put that in there in terms of the unwieldy portfolios, the platforms, the complexity that's involved with that. When you look in Europe and you see 26 infantry fighting vehicles,

that's a lot of full programs that you need to manage. And it's unwieldy.

Now if we were to say hey, there's a couple of programs, fighting vehicles, each one has common parts that can drive competition, or if it's in an open system that allows for more competition into sustainment and so forth, that's fine. But that's not what they're doing. Every one is a bespoke system that everyone has differently. There's actually very minimal commonality across those different systems, and that's what you want, to actually drive the competition within the components. It's not necessarily the overall structure. That's one.

I don't think I addressed the question.

DWG: How do you drive, how do you create [inaudible]? Is there a standards body that is available to do that?

Mr. Schlueter: That's what you're seeing, programs in the military are starting to adopt it. I'll use Army Aviation as an example. They do have a standards body which has said hey, this is what it looks like, this is what the interfaces look like. You can all compete as you want, but these are the interfaces you have to build around.

I love your reaction. You have thoughts on that one.

DWG: -- about what those standards actually, how they get interpreted within the ministry and --

Mr. Schlueter: And it's on two levels. So one is on the technical level which is when you say standards, that's how people typically think is on the technical standards.

But the other piece I think is maybe as if not more interesting from our perspectives on the business lens of it, because what you have is, you have all the major primes saying we don't want to have open systems architecture. We don't want to have more competition. We want to win our program and we want to be the single prime for the next 50 years.

What's been done, again I'll use Army Aviation as a great example. They've actually gone to each of these primes and said that's not the way the business model is going to work. You're actually going to be competing much more frequently, and if you

win, if you compete harder, you're actually going to make more money than you would previously. But you're going to have to compete and you're going to have to win the work. You don't get to win the program once and have the program for the next 50 years.

Can I offer one other point that's important? You mentioned the aviation programs, FCAS, GCAP, NGAD and so forth. The point that came in a lot of the research, and we actually heard from several people and then we looked at all the numbers. There's one point around innovation. There's a second point around will the market materialize. And the truth of the matter is, everyone can invest in their own programs. Say sovereign capability and so forth. But the market will not materialize. You will not have a need globally for so many 6th generation fighters, that a couple of these programs just aren't going to make it.

Again, if you look at the F-35 as an example, that's fifth generation. Basically the F-35 around the table on global fifth gen, so the market materialized, was seen as a very costly program. But in the end they're starting to get to the scale where it's becoming more affordable over time because they have enough market share.

When you look at all the sixth generation fighters, the multiple programs, it's not going to have the same market share that the F-35s had. So you're going to have all these programs with all this investment and oftentimes redundant capability for big programs, and only one probably out of three are going to make it.

So the question is, should they go about it? Will you get enough creative innovation coming out of three people doing things separately versus starting to partner now and say hey, how do we look at it more component by component and where we look at it [inaudible].

Again, I'd welcome your thoughts. I love the smile. I know there's lots of thoughts in there.

Moderator: He has lots of thoughts.

DWG: Frank Wolfe at Defense Daily.

I just wondered what you're hearing so far on the memo that's supposed to be coming out this week on [graphic gross] [inaudible] and aggregates from reform. And I don't know what the possible role for DIU would be going forward, and how that would change. But what have you heard so far on it? Have you heard anything on what [inaudible] focused on?

Mr. Schlueter: Probably nothing more than you've heard. But again, I would just go back to the point that all the way back to, if you look at what Ellen Lord did when she was in the role, she started to look at different acquisition pathways. The last couple of years we've seen, especially with DIU and others, we've seen a lot of focus on how do we do acquisition better.

But again, the question I go back to, if you look at innovation readiness and you look at the top innovators, it's not just about having the strategic intent out there, it's do you have the right, you know, is the governance changing? Are the policies really changing? Are the way people are reacting, is that changing? Are the incentives changing? The people that need to actually implement this, that's the question to ask.

I think it will be exciting. We'll see what comes from it. Whether it's successful or not I don't know. But I don't know if the actual infrastructure is going to change to enable that.

DWG: And maybe just to follow up on Steve's question, just in terms of, you try to get some appreciation as he was sort of saying, consolidation of [cash] et cetera. I mean to me it's sort of the same sort of thing. You can in fact, for example, let's just take F-35, a separate example. But a long time ago they had talked about competing the O&M side of things, right? So Lockheed Martin would not have a lock on that as well. That's where they're making most of their money, right? It's not --

Mr. Schlueter: Correct.

DWG: -- building the fighters.

So the question is, that presents a whole different set of questions, right? Because if you have competition on that O&M side, there can be -- as any acquisition program might, there can be people who don't do well there, right? So if they don't, now that we're sort of removing, it appears removing some

oversight apparatus and we want to get these new detect [bros], et cetera into the game, right? Who's to say that that's going to really work any better? You see what I'm saying? Who's to say that that's going to work any better?

And to just sort of pose a question overall, why innovation? What's the point? Because you look at Ukraine. The press is that we have this tremendous on-the-fly, adaptation on the fly by this country that really doesn't have a whole heck of a lot of budget, right? It really doesn't. So they've been doing stuff on-the-fly, very cheaply because they had to. Their backs were against the wall, right?

At the same time you have basically young men dying. So innovation doesn't necessarily remove what's been true for ages and ages which is young men, mostly young men, out there dying, right?

So why innovation? Other than to enrich somebody, right? Enrich companies, right? What's the real question here in terms of that? I don't know, maybe that's just a wave of 100,000 foot question there, but --

Mr. Schlueter: How many hours do we have? [Laughter]. I love the question.

Moderator: I told them before that the Defense Writers Group is very respectful and calm, but the questions are smart and tough. So we are proving that today.

Mr. Schlueter: Let me offer a perspective. There's a lot in what you mentioned. Let me, both the why innovation as well as the F-35 competition and so forth. Let me start with the why innovation piece.

And maybe if I can, I lead our global practice on putting U.S. bias on this and I think any country can have a bias. There are adversaries here threatening the U.S.-led order, that's for sure. And I think U.S. and allies are losing their technical dominance, but innovation is the way to restore that or match. That's what it comes down to. I think if you look at any country specifically, how are they going to overcome that, or how are they going to restore overmatch? It's through innovation.

You alluded to historically it could be done with people. That's not the ideal situation, right? So I think innovation offers an opportunity to hopefully lessen some of that.

DWG: Back on what Thom was saying, it's Elon Musk -- you probably saw the address early, well it just got published or shown, right? West Point released it. But it was last August when he talked. Again, what Thom had mentioned on the Terminator side, right? And his whole take -- Musk's whole take with the West Point Superintendent was you're not going to have soldiers at the front anymore because they're going to get killed. The autonomous UAFs are just going to, they won't survive.

I don't know if I believe that, because again, it's the state of affairs, right? You talk to people who have been in the game a long time and they think it's really a sales pitch. It's just sales. It's just okay, well, hey, we've got all this autonomy out there and we're going to just make it so there's no manned fighters anymore, there's no -- and the capability's really not there.

So people can talk about innovation all they want, but where does the rubber meet the road? Where is it?

Mr. Schlueter: I'll try to ground this back on the research.

One interesting point related to what you're saying is, there is a lot of value and we can go into the value on some things like autonomy and other things, what it can enable. But what's important is that it's not the silver bullet. Those are [inaudible] earlier. There's still a mix that has to go into it.

What you'll see in the report is that this is one of the things around the lessons learned from Ukraine, that we say a lot of innovators are not learning from the actual lessons. There's still a place for what we call dumb munitions. You talk about some of the autonomy, you talk about some of the digitization of some of this, all it takes is some EW, electronic warfare capability or certain capabilities that can wipe all that out. So there still is a place for things like dumb munitions that actually aren't party to the digital capabilities and so forth, that still has a place.

So what the balance is, obviously we don't have a perspective on that. We can talk about that for a long time. But there is a role for all these different aspects. It's not just that innovation is this silver bullet that's going to resolve it all.

I do want to respond on the piece, I think it was really interesting when you said yes, Lockneed Martin expected to make all their money in sustainment on the F-35. I would offer to you this, that in some of the initial research that we did, and this was a year or so ago. When you look at the business case that was set up, not just by the government but by Lockheed at the beginning, they had counted on, to your point, having this program for the next 40 years, and that's how they were going to make their money. If you look at the profit pools of what they were going to make, it wasn't in the near term, it was in the out years that they were going to make that.

If the government had said to them we want to have something that we can actually compete -- because it wasn't a requirement on the front end. It came in afterwards. If they had set the dimensions early on to say we want to be able to compete this. We've even heard from some discussions that maybe for future big programs they say one firm can only have ten percent of the profit out of this, which is interesting. If you set that from the beginning, industry will respond and create their business cases differently. I'm not going to defend one or the other, but it's maybe not fair to say hey, you know, you can expect to have this for the next 40 years and then change the rules a couple of years into it. That was part of the problem --

DWG: -- on the O&M side or is this on the aircraft and the actual --

Mr. Schlueter: It actually happened on both. O&M is where they expected to make the money, and they had a business case that said we're going to own this program for a long time and make the money. So again, it's just very difficult when a couple of years in the government says we're going to do something different.

DWG: -- actually Boeing was on the O&M side because of their experience in commercial aircraft. They were the ones that DoD, at least some of the higher-ups in DoD were looking at to sort of okay, Lockheed Martin gets the aircraft, Boeing --

Mr. Schlueter: The sustainment, yep.

Moderator: I'd like to follow that. That was the strategic level. Mine's tactical and it comes right out of your report, page 23 or so, where you talk about are we learning the right lessons about the current conflicts. We've done a lot of work on lessons from Ukraine in this group and we've talked about drones. So not judging Replicator per se, but whatever numbers of drones the U.S. fields, everybody will pat themselves on the back, but the burn rate in Ukraine has proven that the numbers being talked about by DoD are just insufficient. I know that Ukraine's burning through thousands of small cheap ones. The Replicator drone is much bigger. But are we missing the point about drones in Ukraine? And what other lessons of Ukraine, if you were sitting with all the mods at Munich, would you say this is the lesson. You're getting it right or getting it wrong?

Mr. Schlueter: I agree, the largescale prolonged attritional warfare is still a reality and I don't think people appreciate that. And they think they'll come in and it will be over quickly. That is not the case. And I think that is one lesson from Ukraine that people are finally starting to step back and say hey, there's something else here. So that's the first one I'd offer.

I think there's a second one that's been learned, is the value of decentralized leadership. Some MODs, you've seen then try to centralize even more. But what we're seeing in Ukraine in particular, that decentralized leadership is really important.

The third one I would offer is, things like unmanned systems, munitions, artillery, they are really necessary without air superiority. Air superiority can change the game. It's not been in place in Ukraine a lot, and so it takes a different type of mix to actually support that.

That's a couple that we've heard, that are coming out that aren't fully appreciated.

Moderator: Thank you.

Ms. Mayer: I think I would add, too, in Ukraine you're also seeing true necessity out there, having to lean on their civilian industry and really lean heavily into dual use, you're seeing things like companies that male electric motors more on

the industrial side are now helping to make motors even for drones. And that isn't being taken into account and really adopted by other ministries of defense around the world.

I mean when we looked at it and we asked people are you using dual-use technology? More than half, 55 percent said no, we're not. And then 51 percent said we don't even have the processes in place to leverage that dual-use technology.

So some things like Replicator are helpful to help reverse engineer and build these programs, but a lot of it is just learning and leveraging the entire industrial base, not just a small selection of even startups that are just unspecific.

DWG: Chad Williams, I'm in Thom's class at Rand for the Master of National Security Policy.

I think Frank brings up a good point, just like why innovation. But do we do ourselves a disservice not to label innovation as healthy or unhealthy innovation? Because when you get back to the aspect of failure, there's an idea in the disability community called the dignity of risk. It's like there's a determination factor that's usually impeded by the caregiver itself, and you talk about implementation.

I'm curious, if it is healthy innovation and innovation's not a bad word because it seems like the framing of innovation was bad. But change is change, and change will happen, so we're going to have to embrace innovation at some level. But how do we define healthy innovation? And then also the barrier of implementation. Like how do you see it through the lens of innovators' DNA? Experimental, right? As opposed to careless or constricting. Like experimental being like one of those DNA factors from the innovators' DNA. I don't know how you put all those together, but like I just think we do ourselves a disservice just to stop at the word innovation as opposed to healthy or unhealthy. Not positive or negative, but healthy and unhealthy.

Mr. Schlueter: I love the question. Maybe start by this, healthy versus unhealthy. We'd love to move the conversation to learning and learning faster. That's the first piece. A lot of folks we spoke with and who research, I don't know if we heard unhealthy innovation ever come up. It was always, hey there were some things we didn't work out very well, but at least we

learned. So that's a first piece. It's more how quickly you learn.

The other piece that I would offer to the implementation that I think was really helpful with this work that was done, and people are finally really starting to take it on, which is they didn't even know how to dimensionalize innovation and how to actually implement that.

So again, when you say to people, and I started comments with this, which is what is innovation? How well are you innovating? Think of anecdotes about how they're doing. But now we can actually say okay show me the different technical domains that you're looking at. Show me your portfolio. Show me your funnel. Show me the talent they're dedicating to innovation. Show me the governance around this. When people start to dimensionalize it like that, it actually takes it out of kind of some of the high level anecdotal are we doing well or not, and actually makes it much more concrete that people can action.

Again, another one I think we could take a couple of hours on, but at least that's the first.

Moderator: Lauren?

DWG: I was just curious about any examples of like positive innovation or like where innovation is going well. Specifically I'm thinking of tech exchanges. You have like the AUKUS Agreement, you have several agreements or partnerships with the U.S. and India making [inaudible]. You talk about the DIU, because you're pushing forward, is sort of using commercial technology, using the dual-use. I'm just curious who's doing it well, where it needs improvement, that sort of thing.

Ms. Mayer: I think there are a lot of examples, as Matt said, anecdotally people will talk about positive examples of innovation. But if you start to look at examples where they're both innovative in the approach, too, is we talked earlier about, made the point about affordable math. And I think satellites is a great example of where there's a lot of players in the satellite market right now, and you've gone from investing $2 plus billion into three large satellites and to starting having companies like Starlink that are investing in smaller versions of satellite for much cheaper versions that are allowing you to really drive innovation there. And that's an

example of innovation, both in the technology but also in the approach to how to field that capability. That's my positive view.

Mr. Schlueter: One comment on partnerships, because it came with a lot and I think it's important. There's a real push from a lot of people we speak with, we need more partnerships, we need more partnerships. We would contend if you look at the data, you almost have partnership overload.

So look at the partnerships you have, and are you actually really getting out of them what you need to get out of them?

What we found is that, and you use AUKUS as an example. At least AUKUS had, it's still being worked out, but some directional guidance around what was expected. They set up a team specifically to go after that and to do that, which is great.

A lot of the other partnerships we see, you'll have some bilateral arrangements, they'll set up a partnership, and then you say is that actually being used? Who on the ground is incentivized to actually go use that partnership and then it's like crickets.

So it's not necessarily just about having more partnerships. It's actually getting out of them what you need to and optimizing them.

So there was a lot of this, actually one of the unspoken barriers for one of the known barriers.

It's known that partnerships is an issue, but what's unspoken is that you just aren't getting enough out of the ones you already have. So many people are so excited to go find a new next partnership that they can put out -- no offense -- in media and writers and so forth, and let's highlight it. But it's like what has actually come out of some of these partnerships. And that's when the conversation gets more difficult.

DWG: Are you watching efforts like NATO, [Diana], [inaudible]. What are your thoughts on how that's going?

Mr. Schlueter: It's the right time. We're going to meet, actually we have a session with them later this week. It's the

right spirit of intent. There's been money collected, donated by many different countries and so forth. That's all positive. Have you seen some of the fast capabilities that we expect to see. Or have you seen [inaudible]? I think that's where the question is, and that's what's going to be discussed this week. Has it really had the impact that they expect and the timeframes that you expect?

Moderator: That's in Germany you're going to have that meeting?

Mr. Schlueter: Correct.

Moderator: Jeff?

DWG: It seems like that the U.S., EU or NATO, are struggling overcoming some of these barriers to innovation. How does that compare with U.S., [inaudible], nation, NATO, their adversaries? Russia, China. Or even smaller investments when you talk investment of transnational criminal groups, now tour groups. How are they -- it seems like it's probably a little outside the scope of the report, but rules of competition in many ways. So how does this compare to what the [gamed] and threat vectors are doing when it comes to innovation and how agile perhaps they're being?

Mr. Schlueter: I love the question. Maybe a couple of thoughts on it.

First, to talk to kind of who are the adversaries? I think there's a couple of big ones. Again, this is a U.S.-biased comment that I'm going to make, but China, Russia, North Korea, and some elements in the Middle East I think is where we've focused.

And in terms of the areas that you're asking about where maybe the U.S. now is, are losing their technical dominance. I'd highlight a couple, and I jotted actually a couple down thinking about it.

One is kind of the erosion of domain superiority. So you look at like the Chinese and the advances they've made. Missile, space, cyber, nuclear. Russia really in EW, also nuclear, hypersonics. The ready access to commercial tech is really enabling some of their military, so that's one.

I think there's a set, one around the evolution of strategic attack. I just mentioned nuclear, but you look at nuclear, you look at hypersonic and so forth, that's changing the strategic calculus of a lot of countries. Even things, pretty much across all those countries we see advances in cyber that they're doing well in, and also potential militarization of space.

I think there's an evolving speed and asymmetry that is maybe benefiting some of them. Things like the spread of AI, Edge Computing, vulnerable supply chains, COTS and so forth changes the game a bit.

Then the other one is I'd just say kind of a system of systems. So when you look at the collaborations, the Russia and Chinese collaborations, you look at the Iranians and what they're doing to proliferate some of the drone technology they have, I think even the more benign things, the Belt and Road Initiative I think you see is quite effective.

So to your question, that's what we kind of see some of the others doing. I do think it's important to talk about maybe what the U.S. is doing. Again, back to restoring overmatch capabilities. We've talked about affordable mass quite considerably, that's important. But the interconnectedness of systems. The U.S. and allies are making a lot of advance in terms of that interconnectedness and how you talk.

As we started this a couple of years ago, that was one of the big issues, was that so many systems were not interconnected and they were having issues talking to each other. The pieces are finally in place to start doing that more effectively. And I also think on the U.S. and kind of Western allied side, you see the industrial manufacturing advances which are just starting to take place. So whether it's manufacturing tech, resilient supply chains, at least on the industry side, GenAI, AR, VR and so forth. I think one of the issues that's finally been realized is the other countries -- I shouldn't call them adversaries, but the other countries, their throughput, their production throughput became so much greater than the U.S. and some of the allies, and that's an issue in terms of ramping up quickly, but I think the U.S. and allies are finally starting to increase that throughput and production which is restoring the overmatch.

DWG: Another question about, there was a chart in there about

the total shareholder return comparison between the [inaudible] and the innovators that I've never seen it quantified in that way. It looks like there's a 3 to 6X differential with the innovators they have with the OEM.

I was thinking about that. I can understand why it's a good thing for the investment community and the shareholders themselves, but if I'm the MOD or DoD, is that a much higher shareholder return rate for the innovators a good thing? Or does it mean that I'm overpaying and I'm leaving money on the table when I'm negotiating a contract?

Ms. Mayer: I think one thing I would offer, and kind of a point on that, is this idea of TSR doesn't necessarily equate to better outcomes, but I think it equates to the company being incentivized to further invest in innovation.

So one thing you see often with the traditional primes is you'll see financial charts come out. They're posting massive losses on some of the programs they have. And over time that's leading to why would I go and invest in these programs again? Or I need a bigger up-front investment from the government to do this. Versus if you look at those innovators who are posting these better returns, a lot of them like Anduril itself investing in R&D themselves. They're not asking the government always to invest that, but they're finding the returns there so they're going and driving bigger innovation.

So it's not always a one-for-one, but there are some real incentives there to industry if they're performing well.

DWG: The more they make the more they're encouraged to self-invest.

Mr. Schlueter: Self-investment is a big deal. If you look at those companies, and maybe there's a few back on here we should have highlighted more. Most of those companies are self-investing which is money that the government doesn't have to put up front, and you have industry in the market saying hey, we're going to place a bet on that because we actually see that as valuable, which is also a sign that they're going to get further support.

DWG: Since this is for the Munich Security Conference, most of the examples if not all of them of those innovators in your

report are U.S., not European. And I think about the European projects whether it's EuroDrone or FCAS. Even for the attritable [inaudible].

Do you see that ever changing? Do you see them figuring out how to do that?

Mr. Schlueter: To amplify your point, we have U.S. examples, because they were easier to find for SOF and to quantify. I think, and this is just a perspective, there's a whole day on Sunday dedicated to European Defense MSC and I think that's part of the reason why. I think there's still work they need to do to really understand what is their industry going to look like going forward in particular. And I think they're wrestling with that. I don't know what the answer is, but there's recognition that more needs to be done, for sure.

Moderator: Josh?

DWG: I wanted to sort of step back a little bit more [inaudible] during the shifting trends in the industry caused by shifting emphasis of the new administration. Not political questions, just sort of -- [Laughter].

Moderator: How refreshing.

DWG: One is supply chain reorientation. Moving things away from dependence on China related to the tariffs but it's not completely the same thing as the tariffs. And then the retaliation that's going to come in terms of whatever happens from the Chinese side, how that's going to affect industry.

And second is, broad searches for cost-cutting. Whether it's DOGE or whatever it is. You're going to see a huge push for audits and then a huge push for just cutting things, even in the defense industry, the defense budget.

I'm wondering if you could just take each of those and apply that to this, and how do you see that playing out.

Mr. Schlueter: On the issue of supply chain --

DWG: One more.

Mr. Schlueter: Yes, please.

DWG: And then semiconductors. You know, it seems like the new administration may totally change our semiconductor policy, in ways that we can't predict. All of a sudden the Chips and Science Bill might not be implemented. So that's three actually.

Mr. Schlueter: Okay.

I'll take the last one, I don't know the answer to the last one. I don't think we have a perspective. Exactly to your point, I mean it's going to change and I think it's going to up-end what a lot of people are playing around, but kind of who knows?

On the first point around kind of both supply chains and tariffs, I would offer what we found is there's still ambiguity, a lack of clarity in terms of where some of these supply chains are. Full stop.

So even though we focus on that, I know the U.S. government's been focusing the last couple of years. There's still a lot of questions when you get down to the tier two and three vendors, around where they're sourcing their materials. There's still not clarity with some programs around what it is. So is it where it's coming from? Obviously it's not supposed to come from certain places, but I think there's still some ambiguity there.

Then in terms of the way the tariffs will impact it, I think we'll have to see how that plays out. I think there's going to be, you know, we've asked that it will be on two dimensions, you know, for specific defense materials and programs and so forth. Technically a lot of programs aren't supposed to be buying from China, and so forth, so we'll see. But the overall economic conditions may impact how much people invest in this segment as well. So we'll see there.

There's one other --

DWG: Cost cutting inside the defense budget.

Mr. Schlueter: That's the other one I would just say it's a bit of a wait and see. We've obviously heard from a lot of people that, a lot of it did come out after we obviously built this, but I think it's more a question of a scalpel versus -- it's

just about how you go about doing it. But we'll see. I think the story is yet to be told on that one. I wish I had more for you.

DWG: Maybe this sort of takes a little bit from what Steve was asking about, but in terms of, let's take maybe the launch market, for example. SpaceX has performed well. They've innovated, they've sort of taken the whole pretty much launch space away from ULA. They're the guy, right?

Is the world's richest man, $400 billion more [than] that. So presumably, the concern is that he could basically start selling Falcon at zero. Right? He could sell it at zero and drive everybody out of business. Right? Blue Origin, ULA. He could do that if he wanted to, right?

So what are the concerns there? You have sort of an "innovative company" that has revelation on the launch market. Drastically lower costs, but what are the concerns there? So innovation. But the flip side is no competition, right? Sort of what he was talking about in terms of consolidation. So is that a concern?

I'm just interested in your perspective on that, because theoretically he could. If he wanted to he could sell Falcon at zero and still, it wouldn't matter to him.

Mr. Schlueter: Drive out the competition and then jack up the price.

If I can make a broader point about the defense market, you know, it's no secret here. A consolidation of the defense industry down to the "last supper" that happened, I mean today you look at what is it, 31 percent of all U.S. defense contracts go to five companies. That in and of itself is problematic. It's representative of what you just described is happening in the space launch sector. And I think the expectation over the next couple of years is, I think there's going to be a desire to increase competition. We started to see increased competition and what that looks like. It can take a number of different things. Weather will play out on SpaceX specifically. I don't know, but there is a need to have more competition in the defense industry.

DWG: Do you have any insights on how the best way forward on that might be? For example, Rocket Lab would be, like you were

mentioning, sort of 10 percent, 10 percent, sort of that kind of arrangement where there would be at least some guarantee even if, for example, one company's bid price was higher. We need to increase the industrial base. Then you've got Palantir's CTO talking about okay, rebuilding the arsenal of democracy. You need to get commercial guys in there. It won't look the same as World War II, because we're not going to be [inaudible]. So one company making, you know, fighter jets or whatever. But you're still going to have, presumably want to have new entrants for General Motors or whoever coming in and really having some capacity to supply, rather than waiting for a Chinese attack or whomever.

Mr. Schlueter: We heard, I'm a little sensitive because the validity of these different initiatives I don't know. But like I mentioned the ten percent. We heard that one. There is perspective, and again I don't want to give this credence because I don't know if it's true or not. But things like antitrust. Or how would you actually go about looking at industry and trying to break it up again? There's different things. If you take a certain hardline approach on how things are interpreted, you might be able to do that.

So we heard several things like that. I think the important point is there's a lot of agreement with what you're saying, that there's concerns about this could happen. What the actual levers are that the government can use and whether they will use those levers or not, I don't think we have a perspective on, unfortunately --

DWG: -- break a Lockheed Martin up or anything.

Mr. Schlueter: I do not. [Laughter].

Moderator: This might have been far outside the purview of the report. I'm curious whether you applied this really interesting thinking on innovation to the what I think is a huge national security risk which is the workforce. When you get to bending steel. I mean we are behind on our nuclear submarines. There are cost overruns. Because there aren't enough electricians who can do that really powerful work.

Is there an application from your report for innovations in the workforce as a national security risk?

Mr. Schlueter: Two things.

One is, it's not exactly about the workforce but it's [related] to manufacturing capability. What we found and this happened in a number of different areas we looked at, there is a lot more spending going into things. When you look at things like the organic depots and so forth, there's a lot of spending going into modernize the depots.

When you actually look at the details, a lot of that spending is around buying new equipment and so forth which on the surface is that's great, of course we need investment. But then you ask the question well, is the current equipment actually at capacity? Are you actually leaning out the lines? IS the flow where it needs to be? It's actually some of the business processes that would have as much if not more of an impact in some of those manufacturing capabilities than just buying more equipment or hiring more people. So I think it's very fair to say there are specific disciplines. You mentioned electricians and so forth that we need more of, but that's only part of the answer. And I think a lot of people are using that, quite frankly, saying it's a talent issue or it's a funding issue when when you actually get under the covers it's much more about how they're running their operations and are they using stuff at scale and capacity and so forth.

Moderator: Good answer.

We're at the five minute mark. I always reserve that for our guest speakers. So Lauren and Matt, any final thoughts before we thank you for your time?

Ms. Mayer: I think one thing we've talked a lot about today in reaching at this very high level, we've also talked about a portfolio approach, making sure you have the right approach across, to have a certain amount of risk. But the only thing we really find, and we found a lot over the years is when you look at a specific project level, it's are the metrics and the KTIs in place to make sure you know what the outcome is?

So this idea of innovation for innovation's sake, a lot of that can be combated by understanding when I'm investing in a new innovation or a new capability, what am I driving towards? What's the outcome? What's the goal that we're looking towards?

You can also see there's a lot within the U.S., you hear a lot of complaints of just investing to meet requirements, but what is the actual outcome of that requirement? So I'd also say we talk a lot with MODs about making sure that they really understand what they're investing in, both in terms of what's the outcome, is the end user incorporated, all these different factors.

Mr. Schlueter: I'll just add two things.

One, thank you. It's really a pleasure to get to speak with all of you, and I appreciate the comments. Again, we could go into some of those comments for the next ten hours. But let me just say thank you.

And the other thing, I'll just leave you with a couple of findings that we found interesting that I think represent the gap. One, for example, 18 percent of defense organizations believe they are innovating at the right pace. So only one in five. And that's actually a 25 percent decline over last year. So it's not that it's getting better. It's actually concerning. Forty-nine percent of respondents said their organizations create impactful innovation. That was also a drop of 16 percent over the prior year. And then 62 percent report that their ability to create impactful innovation is improving, which was a 12 percent decline.

So again, the reason I highlight these, this is a major issue. I think it's a call to action. Again, funding has gone up every year but the actual ability to innovate and the outputs that creates is still a question.

So thank you again. It's a pleasure to be with all of you.

Moderator: Thank you both. Nothing makes me happier than using the Defense Writers Group to get a scoop out there first. Remember, the story's embargoed to noon today, which is still a couple of days ahead of Munich.

I feel smarter because of the past hour, so I thank you both. And because you're off to Munich, I'll say Schoene Reise, Viel Glück, and Danke Schön.

Mr. Schlueter: Thank you.

Moderator: And a special thanks to Claude and his team for making this happen.