"Effective Warfighting in Contested Environments Study Overview"

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AFA Air & Space Conference
National Harbor, Maryland
18 September 2012

Lieutenant General Elder: Thank you, Buck.

I was a War College Commandant, so just standing behind this desk puts me ill at ease. I always tell people that my favorite thing, in fact I may have some old students here, was I never liked to stay at the podium. I liked to go down into the crowd and actually sit down next to them while I was giving it. That way, people wouldn't go to sleep.

I appreciate your being here, particularly since it's early in the morning and actually Randy Walden and I and the entire study group appreciate the opportunity to talk a little bit to this group. Part of the reason for this is we want to expose people to what's going on, and specifically as you'll hear, we're going to actually be looking for your help. That's the reason for being here.

My role in this is just to set up a little bit of the background. Some of you might be familiar with. In the past there was a study that was done out of Air Combat Command called "A Day Without Space." That study turned out to be very useful in terms of highlighting for people how dependent we have been on space and how we needed to start thinking about how we might have to deal with degraded space operations. In fact, one of the things we realized was that calling it "a day without space" was not really appropriate. What you had to realize was that some of those capabilities would have some degradations, but if you thought through it you could deal with it.

As we're looking at this shift now, which some people call the Pacific Pivot, and we start thinking again about not dealing with irregular warfare but dealing with a peer competitor who is more likely to challenge all of the domains, we start thinking about some of these other areas where we could have a problem.

One of the things that we looked at at one point was perhaps we should be doing "a day without spectrum" or "a day without trusted information." Then, people said maybe this should be a cyber study or this should be an EW study.

What we realized was that in the types of environments that we would be operating with against peer competitors, they were going to challenge both those. The spectrum would be challenged and our information would be challenged. But, in the past we had worked with these kinds of things before. What we really needed to do was kind of take a fresh look at this.

What's different about this study compared to other studies that we've done before is that this thing, instead of just looking at tactics or training or taking a look at the techniques we used when we were operating in a degraded environment or particularly as you can see with Mr. Walden, talking about what are the materiel solutions that might allow us to work past this. We're also looking at whether there are ways we should be thinking about changing the way the Air Force basically operates. It's kind of our strategy for how to deal with these situations.

You'll get a little more detail about this as we move on, but this is intended to be not just a comprehensive study that produces a report. Part of this is we're involved in an awful lot of different people who are the really primary thinkers in these different environments, across every major command in the Air Force as well as some of our allies and our sister services with the thought that we will be able to bring together some integrated thoughts about how to really deal with this effective warfighting in contested environments.

The mechanics of the study, and that I'll leave to Mr. Walden, is to expose those of you that are here, that we are dealing with this kind of a study. People say what are you going to do differently now that you're doing this Pacific Pivot? This is part of the answer to that (question).

Specifically from industry, people have come to us and said how can we help? Mr. Walden's about to tell you.

So, thanks for coming. I do hope that you'll write some good questions for us because our purpose here was not to give

you a long talk, but to tee up some questions and to tee up a discussion and we look forward to having that with you. Thanks.

Mr. Walden: It's great to be here today because if I'm with you, interacting and having a great discussion on what we're doing for EWICE, I'm not in the building. So I thank you for that opportunity.

I've got a quick handful of charts to give you an overview, but really we're looking for your participation and questions as Bob has already articulated.

Overall, the EWICE covers a handful of organizations, most notably the U.S. Air Force, the Royal Australian Air Force, the Royal Air Force, the Royal Canadian Air Force, and a handful of senior level studies that were associated in the past. Bob kind of talked about "a day without space" as one of those. There is a handful out there that I know have participated in that talk about how to work in that contested environment.

The primary study purpose is really to try to understand that contested environment. I can't go into a lot of detail here, but recommend the strategies, and I'll break out what each of the panels do, new approaches to operations, tactics that we need to work around, and that's ongoing as we speak, and potentially materiel solutions. The tough part about materiel solutions is one, cost, and timing. In this particular case I'll talk about the timeframe at which we'd like to put in what I would consider those materiel solutions which really will become more adjuncts to legacy platforms as opposed to new platforms.

We have to do that in a highly contested, electromagnetic spectrum environment as well as information dominance type of environment.

The overall scope is to look at what capabilities we believe have been degraded and how we can actually adjust either tactics and/or materiel solutions that allow us to buy back some of that contested environment.

The specific areas we're looking for is the information affected in that contested environment, not only in the cockpit,

but potentially in Air Operation Centers and the overall command and control.

The makeup and participants on the left is from the U.S. Air Force. I'm not going to go through and detail all of the major commands, Air Staff functions and laboratories. But suffice it to say it's pretty broad in overall organizations within the Air Force.

On the OSD joint service and coalition side, there's the breakout. From the Navy, from the Air Sea Battle positions, if you will, OSD in this case would be the ASDR&E. And then we've got the JSF Program Office supporting it. And membership associated with each of the coalition partners.

On the overall study organization, Lieutenant General Rew, the Vice Commander of Air Combat Command is the overall study chair. Dr. Janet Fender is our study director. The three panels that will be doing what I would consider as the heavy lifting and putting that information and data together are at the bottom there.

The overall strategy and operations is Lieutenant General Kresge; the tactics or T3 panel is Major General Lofgren; Jeff (Lofgren) and I have talked at great length on how we get the materiel panel and the tactics panels married up on that I'll say very collaborative arrangement. Then I'm chairing the overall materiel solutions panel.

The makeup of the materiel panel is listed here. Again, I'm not going to go through each name, but in general it's made up of not only Air Staff folks, MAJCOM folks, most of which are represented by the Chief Scientist of each MAJCOM, a handful of folks from laboratories to include other services. And, of course, the FFRDCs. Most notably, MIT, Lincoln Laboratory, and MITRE.

The overall panel missions and roles, broken down in this layered presentation. One is the overall strategy and operations. Again, to be able to at the strategic level be able to communicate what we believe that contested environment looks like, what types of prioritized operational challenges we need to actually come up with, and then present that as an overall

strategy not only to the panels but I think in general for each of the services and coalition.

For the tactics, techniques and training, or T3 panel headed up by Jeff Lofgren, their primary role is in this contested environment what tactics do they need to come up with, what training do they need to come up with, that allows them to operate in that environment? Again, there's been a lot of discussion on what that contested environment looks like, specifically jamming, electronic warfare type things, and what would be the things they would need to do to come up with those tactics?

Having said that, there's also a possibility out there for having a materiel solution, again, in the timeframe we're looking, in the next three to five years. We're looking at potential adjuncts that buy back some of that capability in those contested environments. And even if we come up with a materiel solution which I'm going to need industry's help on, it will most likely require some tactics or training changes. So again, we're working very close with Jeff Lofgren's panel to make sure that we get that collaborative approach worked out.

The overall approach, again, you could have made this very broad and we would probably not have gotten anything done in the six months we were trying, so we had to narrow it down to a handful of what I'll call mission areas or core functions.

The two top ones are air superiority and global precision attack.

Clearly there are a number of other core functions that are enablers to achieve those overall mission areas. We need to understand the effects of electromagnetic spectrum interference, if you will, or jamming associated with information potentially on the cyber side that may be affected and how that would affect each of those major mission areas. Then overall battle space awareness and command and control associated with those two mission areas would be critical or key mission enablers. Then finally, overall need to be able to roll it up in the multi-domain solutions associated with both air, space and cyber, and in this particular case, coalition in the areas where we may be operating in the Pacific as well as joint assets within the U.S.

The overall recommendations will focus primarily on the FYDP, so we're talking three to five years, certainly within materiel solutions as well as tactics. The idea here is to try to I'll say gain some golden nuggets from a materiel solution point of view. See if we can bring those to bear to enable legacy platforms to buy back some of those areas that potentially are affected from the overall capabilities point of view.

The overall foundation certainly on the materiel panel is we really want it based on the systems engineering process. In this particular case I think most everybody out there has had the opportunity to see what those effects are. You've seen the analysis. Again, without going into a lot of detail, there are solutions out there that not only within the services, we've thought about, but at the same time I think you have some overall solutions that you may be able to tee up for us.

The idea is to really try to work both the tactics and whatever materiel solution we can come up with that will allow us to buy back some of that capability.

The overall study plan and timelines, it's really within about six to eight months, we want to be able to out-brief this. I'll go through a little bit more of a time line on the next chart. But the bottom line is there's been a pre-kickoff. The kickoff was in July, essentially General Rew and General Hyten co-chaired a much larger panel, kind of giving the terms of reference, here's what we'd like to go do. We met that same week, our first materiel panel meeting. The tactics panel met in August. They have a schedule that they're lining up to be able to complete their task.

Right now between Jeff Lofgen and myself, we're planning on meeting in October to have I'll say a cross-check associated with both panels to make sure we're on the same page, if you will.

I've got at least four multi-level security type of gatherings. One we met in the July timeframe. We have reps that go out and meet with the tactics panels. We're meeting this week for three days. The overall I'll say goal of this is to pull together what I would say are some very good nuggets of materiel solutions, potential solutions that give you a huge

return on investment from a capability point of view. So large capability or buy-back of capability at very minimal cost.

Then finally the goal between General Lofgren and myself is to bring the two panels together as an integrated solution so when we out-brief this at WEPTAC in January it comes across as fairly clear-cut tactics. Here's what we're working on and here's what we think the solutions that we can present to buy back some of that capability.

The overall timeline, I'm not going to go into detail on this. I'll just highlight a handful of things on here. On the top, we're meeting this week, that's our second major materiel panel meeting. There was a lot of good feedback from not only the MAJCOMs but also the labs and the FFRDCs. (There was) great interaction within the overall panel.

On the bottom (of the chart), I mentioned that between General Lofgren and myself, I'm planning on having a cross-check between the two panels. We plan on out-briefing WEPTAC in the January timeframe when everybody gathers out at Nellis. Finally, there will be an out-brief with COMACC and AFSPC Commanders in the February timeframe.

What do we need from industry? Most of this you're familiar with, but this is just to highlight some areas that may get at least some creative juices flowing.

We've talked about this in the past, even on the panels. I think General Rew was pushing this hard. Are we training properly in those contested environments? And how does that training play out? Is it realistic?

In areas that we might be able to leverage some of your great ideas, what kind of enhanced training tools and capabilities can you bring? Live, virtual, and constructive-type of training? Again, trying to replicate that contested environment and provide some realistic training for the crews to come up with tactics that make sense.

Also,looking at potential advanced electronic warfare concepts, both air-to-air and air-to-ground. And then clearly, we depend greatly on GPS. What does that look like when we're denied GPS and what would be the effects associated with that

and how do we train in that and how do we buy that back? Then clearly between I'll say data links between either early warning fighters, even missiles and I'll even say beyond line of sight satcom communications, we need to make sure that if that's contested we need to be able to ensure that we can communicate and provide command and control in that denied environment, and then look at potential ways to buy that back as well.

Then in turn, maybe look at ways to basically and effectively gauge the adversaries using similar techniques of electronic warfare.

I'll talk a little bit about when we need to do the solutions. Mostly we're looking at in the next three to five years, and of course everybody goes well, we can't get things done in three to five years. I will tell you there have been a handful of opportunities, certainly in my job today, of putting things out when it goes in the current fight, ISR-related things, you can do things in a relatively short period. But again, it has to be fairly simple and it has to be a good return on investment, meaning there's a great capability for low investment because you're talking about not really going through a full POM process. In this particular case, we might be able to get something in the '15 POM, but the most likelihood of starting something now is you've got to basically reprogram things to make it a reality. The focus will be in a short period of time, which really tells us it's more of an adjunct.

We need to be able to integrate that into a legacy fleet. At the same time, folks are looking at, I'll say modifying tactics or training differently, so it doesn't interrupt that. Again, I can't mention this enough. It's really got to be cost-effective. Basically if it breaks the bank it's not going to help us very much. So we're looking at great ideas, adjunct capability to buy back the areas that we may have lost some capability.

This is just to, again, get the creative juices flowing and some questions that will come our way. But most of you know this. We understand what we believe that contested environment looks like. We're looking to be able to operate in there not just from a U.S. Air Force point of view but our other sister services, our coalition partners. They're a part of these panels and this overall study.

We know through the training and the tactics officers that for the most part they've been working in really a benign environment or a permissive environment. We need to be able to one, train effectively in that contested environment, but more importantly, try to buy back some of that capability based on potential materiel solutions.

Through Jeff Lofgren's tactics panel, I'm looking for them to identify some of the gaps, whether it's through the overall threat that creates that gap or potentially try to understand the overall tactics in the gaps that are created from where they may not be able to buy that back and a materiel solution might be able to bring something forward.

Without any further ado, I appreciate your time, and Bob, I appreciate the opportunity to be a part of this panel, and I look forward to any questions. Thanks.

Moderator: You certainly have an aggressive charge and a timeline there. As the questions are coming up I'd like to ask one. You said the solution can't break the bank. What sort of a bank do we have to break right now? Is there a realistic, is there money there and available, I guess is what I would ask?

Mr. Walden: Clearly the '13 PB is on the Hill. We started this study I think after that was submitted, so by definition it's not in the '13 PB. My understanding is the earliest opportunity we have to "put something in" would be about the '15 POM. Like most things that fit into what I would consider urgent and compelling, there is opportunity out there to be able to leverage, and again, for a small amount of dollars, to try to buy back capability.

So, the challenge is not coming in with a great idea that costs a lot of money. The challenge is coming in with a great idea that buys back capability. That one could be made operational. That means it's got to have tactics associated with it and potentially a low cost that allows the buy-back of that lost capability.

Moderator: General Elder, we've been operating in essentially uncontested environments for quite a while now. Is

there a danger that we've lost our edge? Or, how do we keep that edge?

Lt. Gen. Elder: One thing I can tell you that will make people feel a little better is that there's been a lot of interest in this for a number of years and in fact one of the reasons I think that General Bill Rew, the study director, he's been the champion of this for a long time and has really been pushing particularly out at Nellis, both in Red Flag and the things that we do with the weapons school, to really try to force people to think about what could happen in this contested environment.

What's been happening for a period of time now out at Nellis in particular is, they've been doing things like basically denying GPS capabilities to the crews, degrading their communications, exposing them to some of the high end electronic warfare threats, basically simulating some of the things that would happen if you were losing some of your space capabilities, and then looking for the crews to be able to deal with that. In fact, some of the things they've been doing at the weapons school is actually working, when they do their research papers, if you will, it's actually to look at how they might deal with this.

One of the challenges that comes with this, which is one of the reasons why it actually is worth pointing out, the looking at some live and constructive ways to simulate these things, to help not only with the training but in the tactics development, is that we don't have really good ways to simulate these problems today because if you do something to jam a GPS signal or a line of sight communication, then you end up having an effect on the civilian air travel and people's TV sets.

Our ability to train in these environments and to develop tactics is somewhat limited from that standpoint. So while a lot of the solutions we're looking for from a materiel standpoint actually go to how you would actually deal with the problem itself, there is an aspect of this that goes to the training.

There's been a lot of attention to this. But, one of the foot stompers is I guess we've gotten used to the fact that we can fly remotely piloted vehicles over Afghanistan and for a

long time over Iraq and it's worked really well for us. However, we didn't really have to deal with either our line of sight communications or our satellite communications being threatened, and we didn't have people trying to get in and actually put some kind of what you might call cyber threat on those systems.

We know that if you deal with a peer adversary those things are going to happen, and rather than wait until it occurs, part of what we're trying to do with the study is think about what a potential adversary would do and try to stay at least one step ahead of them.

Moderator: We have some great questions from the audience. I guess the first and simplest one is could you explain the difference between EWICE and Air Sea Battle. Or, an interaction.

Lt. Gen. Elder: Air Sea Battle, that office is working together, this is the Air Force and the Navy in particular, but all the services are actually looking to develop these multi-service tactics to look at this. There's a lot of work that's going on. In fact, (there are) several conferences in this regard. But, this is a focused study that's specifically looking across these domains and specifically looking at the spectrum and information threat and trying to look at how you bring these different elements together from a study standpoint. So, this thing will actually be supporting what will happen, the work that's being done in Air Sea Battle and all the things you hear about with the A2AD type environment, but it's certainly not intended to be a replacement. It's going to support that entire effort.

Mr. Walden: Really, it's, I'd say EWICE is very complementary of Air Sea Battle. If you notice in Air Sea Battle, there's no timeframe. There aren't big major panels. It's a very good concept. It's a must-do, if you will, but I think EWICE does, at least attempts to do a great job at trying to complement the overall Air Sea Battle. If you look at the timing, we're trying to do that in its near term. It's more adjuncts but it's also mindful of potential investments that would be in the future, that would support other opportunities for Air Sea Battle.

Moderator: We have another sort of relationship question. (It is about a) relationship between EWICE and the Joint Area Layer Network studies and proposals. Is this a strategy or a TTP that executes at EWICE?

Lt. Gen. Elder: Again, EWICE is very complementary to the overall Joint Area Layer Network concept today. I don't think we have anything out there that fits into what would be a robust networking capability from the air, even though there's lots of concepts of potentially using Global Hawks or other even medium altitude type platforms to provide that gateway.

I think where EWICE is going to focus will depend greatly on our data links, fighter data links, our overall early warning to the fighters, and even potentially fighter to missile data links. We also depend greatly on our satcom ability to move data as well as communicate. In the areas where I think EWICE will contribute, the goal would be to identify clearly what things can we buy back in a very short period of time.

There are ideas out there to be able to link up say, for example, fighter to fighter, F-22s talking to F-15s, and maybe potentially having the Link 16 contact. So there's a lot of good work that is ongoing. There's been a lot of I'll say areas where it's been identified as potential gaps in just the overall networking capability. So I think EWICE will at least contribute and certainly complement what becomes, if it becomes a Joint Area Layer Network concept.

Moderator: You're involved with coalition partners in this effort, at least the four-eyes coalition partners. How do you ensure interoperability with other potential partners and different platforms?

Lt. Gen. Elder: One, trying to do interoperability even within your own service sometimes can be challenging. So it is difficult. The one thing you have to start with is certainly the dialogue between the coalition partners. And I think EWICE and certainly through the leadership of General Rew and General Hyten, was to make sure that we afforded that opportunity for dialogue.

The last materiel panel meeting we had we spent I'll say some very good discussions with the coalition partners on the

potential of having their systems out there in the fight. We know it will be there. And the potential for how we even buy back what may be lost capabilities due to that contested environment on their side. But I think again, the key is the dialogue, the understanding of their systems, how they actually work their tactics and their systems, and then the potential understanding of lost capability and how we might be able to buy that back, both on the U.S. side as well as the potential for buying it back on the coalition side.

Moderator: With the focus on materiel solutions to the things and certainly U.S. industry is showing the capability to produce "disruptive innovations." How do you incentivize the industry to pursue those types of solutions that you're looking for?

Lt. Gen. Elder: I think today, because I've worked with a number of industry partners out there, I think for the most part they're fairly incentivized based on at least the feedback I've gotten. I think the key here is to be able to take what has already been generated both in discussions and I think in at least demonstrations that I've seen from most of the industrial partners out there, is to be able to maybe focus on getting some of those materiel solutions from a demonstration phase or a prototype phase and into something operational which is going to require a different level of integration within the operational forces. And again, in my mind in a three to five year timeframe you're looking at adjuncts as opposed to a brand new weapon system that takes a long time to build.

When you're thinking adjuncts, again, I'll put it in terms of a podded system on a legacy platform. We're talking about that with potential data linking between F-15s and F-22s. That is a whole different way of getting around what is a more near-term threat and a potential solution. It doesn't have to be the long-term solution, but certainly in the timeframe we're looking to buy back some of the areas where we've lost capability, I think it's the right way to address it.

It may be that we take something from a demo or a prototype phase, get it operational, if it will buy back some capability and maybe some time, and then we move on to a much greater modernization or solution.

Moderator: A couple of related questions here. Are you getting the support you need from the AFMC folks, and particularly the product planning or the developmental planning offices at all the product centers? Not just one or two.

Lt. Gen. Elder: I think the answer is yes. Clearly we're getting great support from AFRL, so from the lab point of view. In fact when the notice went out there was a handful of folks from AFRL that said we think we've got some good ideas and we'd like to participate.

Overall, I think that the program offices out there that may be affected, again, if it's an adjunct and it affects their weapon system, we have to have that dialogue with them. I think that that's forthcoming. Where we've already recognized some potentials of which could be buying back early warning capability, we've already started a dialogue with them as well. The good news is that for most of the program offices out there, this is not new. They already kind of know how their weapon systems work in those contested environments and have looked at potential solutions. The real question is, how do we focus the effort to be able to gain that back in the timeframe we're looking at?

I think overall it's been great participation from AFMC and the program offices and certainly the lab.

Moderator: For either of you, what do you see as the impact of the contested environments as we shift more and more to RPAs? How does that complicate your problem?

Lt. Gen. Elder: Actually, particularly people in PACOM, for example, are very interested in looking at this. This is one of the drivers. When you set stuff up to where you're using an RPA and today we require quite a bit of connectivity with that RPA to be useful not only to be able to command and control it, but also to actually get the information off the platform. The RPAs have a lot of benefits for the warfighter, but right now it does require an uncontested environment. We're not going to have an uncontested environment if we deal with a peer competitor. We still want to use RPAs. So that is a big piece of what we're trying to look at. And, it suggests that that's why you need to take this broader look which is not just can I solve the specific problem of say a particular link that we

have. That's one way to look at it. The broader look now is is there a different way to operate these RPAs that would allow us to be able to use them effectively even though the environment is degraded?

So, rather than necessarily try to fight through the degrade itself, try to figure out how you can still use the RPAs, recognizing that the way we currently use it today may not be possible.

That's one of the reasons why the strategy and ops panel, for example, is looking at this larger level which is to say we know we're going to have to deal with this contested environment, we know we still want to use RPAs. Is there a way that we can do that, recognizing that we're going to have problems with our GPS and other PNT capabilities? We know that the coms are going to be degraded.

I might follow up on this a little bit. There was a question earlier about what would incentivize industry. Industry is always working on different ways to do things better, but it typically is being done in a given context. There may be things that are on the books right now that in the current context really don't fit.

What we're doing with this study in a sense is we're shaking up the way we look at things from an operational level.

For example, at PACAF there's not only interest in the tactical part of this, and a lot of interest in how you do your command and control, how you operate your operation center, how you bring in all your intel data and how you get that information out to the platforms, things like how can you change the way that you deal with it?

In the past, as an example, when we'd send a crew out if something happened and you couldn't make contact say with someone on the ground for a target, then you had another target that you would use so that you didn't just fly back and carry your bombs back. Kind of a lost comm procedure.

We're looking for the equivalent of that, only in this case we're saying we may be able to get you some kind of basic information that will allow you to prosecute your target, but we

may not be able to give you the nice high bandwidth solution or information that you've had in the past. So we want to rethink this. What we're hoping will come out of this is that there will be some ideas that industry or the labs have had that said if you were doing this differently this would have been an interesting way for you to approach this, and that certainly will approach in terms of how we do the RPAs, but in just about everything that we do.

Mr. Walden: Currently, we're operating RPAs in three COCOMs today. And even though it's kind of a phase zero portion of the conflict we do operate certainly Global Hawks in three of those areas. From the medium altitude side, MQ-9 specifically, it's really a multi-mission kind of a platform. So in areas where we have platforms that have to stand off, you might be able to use those as adjuncts in that standoff capability until such time as we need to use the ISR capabilities or the close air support capabilities that are part of those weapon systems.

Moderator: Sort of going back towards the training side and the tactics side, do things like Cyber Flag and Red Flag present training opportunities to do this? And what part of EWICE could not be tested or exploited at a Red Flag or a Cyber Flag?

Lt. Gen. Elder: This is actually one of the areas where we need some help. For example, right now just to give you an example, when you have a crew deal with the possibility of loss of GPS, the way you simulate it is you have them turn off their GPS and then work around it. In the real world it's not going to happen that way. The GPS is going to be degraded and you may not even realize that your GPS is out. So part of this is you would like to have the crews be able to understand that they have lost the GPS or that there's something happened that's pulling the signal off and that they're really not where the GPS thinks that they are so that they can deal with it.

We're looking for ways to be able to simulate that kind of environment. We can do it today somewhat in simulators, but we can't really do it in the live environment. That's an example of something we can't actually do.

For example, we can't actually put the GPS jammers, the ones that we would actually deal with in real life, because

those same GPS jammers would have the same effect on civilian air traffic that's nearby. We're not able to expose our crews so those types of problem sets.

From a comm standpoint, once again, what we do if we're going to restrict the comms is we actually have to do things to tell them that the comm's restricted. Most of the ways that an adversary would actually degrade those communications we could do that same thing but we can't do that without degrading other civilian communications at the same time.

From a training standpoint, one of the things we're looking at doing is coming up with ways to be able to provide that same environment. One of the things that happens, we found particularly out at Nellis, is when confronted with a problem, if you take a materiel solution, that's one of the things industry has told us before, you come up with a great solution and then when you actually give it to the crews they make it an even better solution.

What we want to do is have a capability to expose these really good thinkers that are operating in this environment or actually operating the platforms I guess I should say, all the time, and make it easier for them to put themselves in that situation. To think through the problem set and develop in some cases tactics, in other cases come back and say is there a way we can tweak the software that would enable us to do it better? It's that give and take that we're looking for and it's why it's so important we be able to provide that kind of training environment for them.

We do it today, but we basically have to simulate the problem. That's an issue for us.

Moderator: Why is this study needed at all? It seems to me you're just having a bunch of meetings. What particular value-added does the study provide in your mind? That might be a good summation.

Lt. Gen. Elder: We thought since it's the last question we'll both talk on this one.

What's interesting about this study is that the purpose of the study is not to generate a report, although there will be a

report generated. The purpose of the study really is to provide an environment where people across these different areas that are involved with this are thinking about the same problems, and we're actually getting this exchange. It involves not only the operators and the people looking for materiel solutions and the C2 people and the intel people in the Air Force and across multiple MAJCOMs, but our sister services and our coalition partners. Part of it's to understand the interoperability problem, but the other part is because part of the solution may come from taking advantage of a capability that a sister service has or that a coalition partner has.

This study's important because number one, it's a way to expose this problem to a broader set than the people who work it every day. As an earlier question, Air Sea Battle, they work this all the time. The people that are working A2AD either from a tactics standpoint or a materiel standpoint work this every day. What the study has really been put in place to do is to try to cross all the different, I don't want to call it stovepipe, but the different areas that are working this and allow the exposure across those different areas and see if we can't come up with a synergistic solution.

The other part of this, though, is as we expose more and more people to the problem set we'll get more and more people thinking about what the solutions could be, and then hopefully that's going to lead to in the future, we have a better capability to deal with the environment.

Mr. Walden: I think in one word it's really to add focus. There have been a number of studies out there. There's been a lot of assessments associated with what that contested environment looks like. A number of the operators, a number of the program offices and the platforms have a pretty good understanding of how their system would perform and how that capability would be affected in that contested environment. So in my mind when you start to say here's the timeframe, three to five years. You're talking about an adjunct system. You're not talking about a brand new system. You're not even talking about cutting a hole in a current airplane to put a system on there that buys back that capability. You're talking about potentially pods and concepts that add better networking to move information.

So in my mind, I think this study, this panel, a number of the panels, will add focus to the overall discussion of what we mean by operating in that contested environment.

Moderator: Thank you for a stimulating presentation. The number of questions we didn't get to is reflective of how the audience enjoyed it.

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