



A Fireside Chat with Dr. Ravi Chaudhary

March 6, 2024

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

Welcome to Air & Space Warfighters in Action. I'm Doug Raaberg, the Executive Vice President of your Air & Space Forces Association. I want to thank everyone in the audience and online for joining us today to be with Dr. Ravi Chaudhary, Assistant Secretary of the Air Force for Energy, Installations, and Environment. Dr. Chaudhary is tasked with ensuring both Air Force and Space Force installations are always ready and capable of projecting combat power in great power competition. But before we go into that, AFA's Warfighters in Action is made possible, thanks to the generous support of our sponsors listed on the screen. Thank you so much for your continued support. Dr. Chaudhary, welcome back and thank you for joining us.

Dr. Ravi Chaudhary:

Great to be here.

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

Now, you've spent a lot of time and we've got a lot of territory to cover since the Warfare Symposium last month.

Dr. Ravi Chaudhary:

We sure do.

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

You've spent a lot of time focused on Secretary Kendall's fifth operational imperative, and that's to really defining the optimized resilient forward basing, sustainment, and communications in a contested environment. Let me throw you a softball and then we're going to go into some real good discussion.

Dr. Ravi Chaudhary:

All right.

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

Can you tell us what you've learned and how you're now moving out to really reoptimize for great power competition?

Dr. Ravi Chaudhary:

Yeah, thank you Doug. And again, thank you everybody in the AFA community for tuning in on this really, really important subject. To kick it off, the secretary, our chief and our top four couldn't have said it better. We are out of time. We have a threat regime that is going to challenge us in ways that we have not been challenged before. My job as the assistant secretary for installations, energy, and environment is to make sure that our installations are ready to respond to this challenge, and I will. But it's going to take a village. It's going to take a lot of collaboration, a lot of understanding of what the threats and challenges are that we face. That all kicked off when the secretary announced our GPC sprint that went



on earlier this fall. In that period of time, the entire installations enterprise has been hard at work defining what those challenges are.

And I'm going to kick it off by talking a little bit about my background really quickly and a short story. You can read my bio, but I want to share a little artifact that I brought with me today. This looks like an ashtray. It is an ashtray, but it's actually a 75 millimeter shell that my grandfather fired on the Chinese in the 62 border war. I had a chance to meet him in the '90s and talk with him a little bit. He shared a little bit about his experiences as a war fighter in the Indian Army. He had a chance to serve in Africa for the allies and he also participated in the China border war. In our discussions about war fighting and the lessons I learned as a new academy graduate, he summarized some of the key points. But the thing he ended with was something important. He told me, "You're going to meet a lot of challenges, but I want you to do one thing. Don't forget about China."

That's pretty profound thinking about where we are today and the challenges we face. In the course of the sprint, we came to the conclusion from an installation standpoint on really three key points. One, that our installations are no longer a sanctuary.

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

Right.

Dr. Ravi Chaudhary:

We had to break that down into its core elements for a solid four months to truly understand what the nature of that threat is. And what we concluded was that our critical infrastructure, our key nodes of logistics are not going to be operating in a benign environment. Point two, that our installations are as diverse as the missions we execute. For example, we have forward expeditionary installation... Of course, looking at OI-5 and what that means for forward basing and how to approach to addressing challenges. But we also have employed in place missions that are almost as critical from key nodes in command and control to the ability to make sure that our nuclear capability meets its responsibilities to the National Command Authority.

We've got to think about that environment and the reach that our potential adversaries can have. I'll start with the most glaring example, the threat to installations posed with energy in Europe with the Ukraine war. Installations, we know, are now stressed from an energy standpoint and are having to meet that challenge going forward. Coupled with the fact that China has established a rocket force that's designed to provide kinetic threats to a support force that's designed to do non-kinetic, which I believe is going to transition to kinetic results, that places us in an entirely new regime for how we understand our installations are going to meet their resiliency and mission capabilities in the future, which is essentially in some cases get the jets out of town. But in other cases, make sure that our nuclear posture is robust. And in other cases, ensure space forces are ready to execute their missions without fail. That maybe defines for you those key points.

Then the third point that I'd like to say is how we respond to it. That third conclusion is how we respond to these threats could very well be the margin of victory in great power competition. And I want that to hit home today because we've got to make sure that our installations are resilient, survivable, robust, and ready. That's going to take a lot of effort on our part. We know that budgets are not going to fluctuate in a way that we want them to, but there's a lot of innovation that we can exercise in this period and I'm really excited to talk about some of those things today.

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



You really touched on something. Your father on the border war there of India and China, geopolitically what's still significant today, it's still ongoing.

Dr. Ravi Chaudhary:

Yeah, absolutely.

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

But let's bridge to the time of consequence as General Allvin talks about it today. Let's talk about your department. How ready do you feel you are to be able to fight without losing the combat power and specifically let me take in little small bites? Let's start with just pure energy security being the key to that.

Dr. Ravi Chaudhary:

All right. Our logistics capabilities, particularly when it comes to operational energy, are unmatched in this world. We should take some comfort in that, but not a lot of comfort because the trajectory that's going to ensure that we're ready in great power competition is a little different. But I can say to you today that our current state, our logistics capabilities, our ability to move fuel, set up tank or bridges, makes us unparalleled in the ability to maneuver our forces on a global scale. But threats are growing. Logistical challenges are growing, and we know now as a result of our sprint that the pace and scale of operations is going to be a heck of a lot larger than what we had been previously optimized to in the past two to three decades.

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

You take modern warfare, you think of, for example, cyber attacks, potential grid failures both in location or perhaps a grid that you're bringing to a forward location. At the same time, let's face it, you still have weather related events to deal with simultaneously. Can you address all that because that's a heck of a challenge when you're talking about moving in a battle space?

Dr. Ravi Chaudhary:

Yep. I call it the big matzah ball, and it's a big challenge that we've got to own up to and start attacking today. Let's start talking about how energy impacts our installations. We know that as a result of the sprint, that energy could be a limb back in executing our mission because we'll have a responsibility to get our forces down range, get them to where they need to go, get our jets out of town. But we'll also have to contend with a less than benign environment to ensure that our key logistic nodes are robust and ready to keep the flow moving, keep that TPFDD going forward so that we can sustain a fight. And one of those areas I see... One of our former DLA directors of energy out there. I'm tickled that you're here, Vegas, because operational energy is going to have just as important an impact in great power competition. How much we can sustain the fight, fuel the fight is going to drive our ability to sustain a great power competition.

Taking a look at how we deliver operational energy, my Deputy Assistant Secretary for Operational Energy Roberto Guerrero says, "More fuel for the fight." We've got to change how we think about operational energy and ensure that we give ourselves as much agility as possible because when those resources get turned down or when our adversaries decide to put the strain on energy resources or attack key nodes that cripple us, how we exercise our agility, how we expend that fuel could be just as important as how we collect and conserve it as well too.



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

Ravi, I'm curious, when you were in Baghdad, multinational coral rock and stuff and you saw bear base and some established so forth, the very things you talked about with Bert Guerrero trying to get the fuel to the fight and everything else. How does that really inform you now in the position you're in terms of...

Dr. Ravi Chaudhary:

It is huge. I'll relate, you brought up Baghdad, but I'll bring up the Afghanistan fight example from the Afghanistan words as well too. If you fly a C-17 into a down range location, think about the roadmap a C-17 takes from Charleston or McGuire to Europe or hit a tanker and go directly down range. Think about the diversity of the installations as you go from CONUS to Europe and to a downrange location. That diversity goes from a highly enriched energy environment to a highly critical energy environment in which your abilities or needs to conserve energy become more and more critical to the fight. Let's say I land in Baghdad or in a much more austere location. For a C-17 to land and ask for fuel at that location, you could drain the entire fuel bladder. What does that mean?

That means less caps. That means less fire emissions. If you've got helos there, that means less diesel for generators to provide critical redundancies. Ultimately, you could come in and completely drain that location. What do you need? You need capabilities that allow you to land and say, "Listen, I don't need another bag of fuel. I'm good, because I have the range and payload capacity to do what I need to do without impacting an expeditionary location." Hopefully, that gives you a sense of what the range and capability and why that connection to payload and range is intimately integrated with the capabilities and diversity of each individual installation.

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

I'm going to take this from forward deployed, let's come back home for just a second because, let's face it, the cost of energy is a big impact. Can you address that in terms of the cost of energy going up and your ability to not only satisfy domestic operations, which I'd like to see you address, but also the ability to get out of town? And the cost.

Dr. Ravi Chaudhary:

Yeah, absolutely. The cost of energy, as you know, is not getting cheaper. Nor is our ability to maintain reliability on our installations as well. Working with industry, working with local power companies, working with local communities to establish third-party methodologies, new ways of acquiring energy in order to be decisive is going to be critical. One of the things that we're doing is moving to more privatized models of energy, particularly on the electrical side, but it is also focused on water and other forms of energy as well too, in order to ensure our installation stay viable. That means we've got to work hard with our local communities and industry to establish energy partnerships that are viable. We're going to invest more in capabilities that build those partnerships. Here's why. When you have the ability to plug in and plug out with the local community, you can island from the local grid and that allows you to get the jets out of town.

That's going to take a lot of work and a lot of partnerships. As I stated before, our threat is real and our adversaries are working hard at energy. I had the chance to go to China in 2018, and one of my stops was at this place called the Three Gorges Dam. I think we have a picture of it if. We're going to flash it up there real quick. It was awe-inspiring because I've never seen such a large facility like that before. It was absolutely gigantic. It's one of the largest hydroelectric facilities in the world. At the top of the hill where you could see the expanse of the Three Gorges Dam, there was a big statue and it was a statue of a



farmer holding a hammer with readiness. I was talking to some of the locals there and I asked, "What does that statue mean?"

And they said, "That symbolizes the struggle of China and the determination that we have to overcome that struggle." And right there, I came to the conclusion that we are in the midst of a very competitive energy race with our adversaries, and that could very well be crucial to us. That means we've got to do the same thing on our side and mobilize our nation to understand the impacts of the energy race. One of the things we're doing is really focusing on community partnerships and third-party financing with local communities that allow us to do that. Let me give you an example. At Kadena Air Force Base in Okinawa, as you know, they were recently hit by a typhoon this summer. What they did is they established an energy service performance contract with their local community, host nation partnership with their allies, if you think about that.

Now that allowed them to garner LED savings from LED lights and they use that to purchase a microreactor. Microreactor technology allows you to better distribute your power. It allows you to plug in, plug out as I talked about, to island from the local community, but it also gives you the opportunity to store energy sources and get redundant energy sources. That microreactor, when that typhoon hit, kicked into high gear and prevented Kadena from losing any power during the entire duration. That's resiliency. That's a ready base that under any condition can get the jets out of town and sustain the fight. And that's what we're going to do more and more of. We're really looking closely at microreactors, what that technology does for us, and we're going to invest in that.

But it's going to take a village. It's going to take industry partners. It's going to take academia. It's going to take local communities to bundle these capabilities and allow us to act as a nation. Think about that. Act as a nation, and allow us to meet the challenge of great power competition. This challenge, it almost transits all of the dime, if you think about it, and allows us to unify in ways that we haven't done before. I think that's a really great result of how we've examined GPC and what that impact is on our installations. And most importantly, what we're going to do about it.

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

Yeah. Well, first of all, where are you focusing right now? For example, microreactors, microgrids? You talk about Kadena, how about Tindal or Eielson or other locations? Because I think a lot of people... Our audience may be thinking the old generator and the old plugin cords and so forth, but you're talking revolutionary capability.

Dr. Ravi Chaudhary:

Yeah, I'm going to harken back to my expletive at the Warfare Symposium. "If we're going to be successful, we're going to have to science the shit out of this." That means that we've got to get our installations up to par with modern energy grids, modern capabilities, and leapfrog where we need to. You brought up Eielson Air Force Base where a really exciting thing is going on. We are poised to develop and install the first micro nuclear reactor capability. It'll be a five megawatt nuclear reactor capability at Eielson Air Force Base. Now, currently, there's a coal plant that allows the base to operate independently from the local grid, and it has an incredible capability. What we want to do is augment that with this new technology. Now the cool thing is and you can see the illustration of what a microreactor is, but a lot of people think nuclear reactors have these huge things, acres and acres, that are dangerous things like that.

But this is all new fuel, all new technology. It's small pellets of fuel. These pallets of fuel have the capability that when they overheat, they shut themselves down. We're in a zone of new safety capabilities, and the best thing about this is that you can pursue a commercial license in parallel with the



development and installation of this technology. Typically, previous business models where we acquire the military hardware, purchase it, execute the mission with it, and then we decide later on whether we want to pursue licensing capabilities. But the business model to this is different. We're going to pursue licensing from the get-go so that the entire state, the entire nation gets the benefit of this technology. Moving forward with our operational capabilities is going to bring benefits to our nation as well. We are super excited about this capability. We are looking to deploy it in 2027 and really just bring resiliency to new levels and new capabilities. We know that the other services are watching closely. We're working with them in ways that allow us to harness the benefit of this across the services.

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

Okay, now I'm going to get you back into Paycom.

Dr. Ravi Chaudhary:

All right, let's do it.

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

We're going to Guam, we're going to Tinian, Saipan, whatever locations. They have their local energy sources, or maybe not. I'm thinking of buying and selling power. Can you address how you see that in a wartime scenario? Our ability to borrow or buy power, but at the same time sell power.

Dr. Ravi Chaudhary:

In my opinion, it's all about agility. We have an outstanding team in IE and AFMC through the Installation and Mission Support Center, IMSC. Big shout out to the team that's been working these problems for a very, very long time. However, we recognize now that the clock is ticking on ensuring our installations downrange have the energy they need to execute their mission. Looking at novel approaches, everything from geothermal technology to wind and solar. Bringing new and novel technologies. People used to think that, "Okay, you bring solar in and the base has more vulnerabilities." There's an element of frailty involved with some of these non-traditional methods of power... Solar's not non-traditional, but he a capability that people view as somewhat more frail. It's exactly the opposite. By building redundancy into your installation in terms of power and energy, you can turn off and it's almost like when you put that microgrid in, it's like putting a power bar into your room because now you can plug in power sources that you want, and you mentioned sharing that energy.

This allows us to work with host nations to help solve their community challenges as well too. We're getting ready. We have a couple of nations that have already reached out to us to better understand how they can bring carbon-free electricity, new sources of energy that impact and have a great effect on resiliency. You brought up Guam. Just think about that, as you know with Typhoon Mawar that came through there... I'll tell you a story of these three incredible Airmen that when that typhoon hit, their job was to man the data centers that were protecting our NIPRr and SIPR capabilities during the typhoon.

And when it hit, they grabbed their COTS and they went to the data centers. They set up their COTS and they were literally building dams with sandbags around the data centers, and they stayed in that facility for roughly 72 hours straight. People were bringing them food, but the winds were so heavy that the hinges on the doors were literally being blown off. They had to contend with this extremely austere event. But, of course, the heroism and the dedication and devotion of our Airmen and Guardians always come through. They protected that NIPR and SIPR site and we had complete connectivity all the way through. But it wasn't because of our material resiliency, it was because of the resiliency of our Airmen and Guardians.



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

I'm really glad you brought that up.

Dr. Ravi Chaudhary:

Yeah, and I'll finish that with saying that just signals to me that we need to do more to build resiliency of our installations so that our Airmen and Guardians have that ability to kick ass when they need to.

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

Yeah, it's a great example of multi-mission capable Guardians and Airmen at home and deployed because, let's face it, the Guardians are deployed in some case. What's on my mind is, and I imagine our audience is, you're going to put them in places where the electrical grid is different. They're going to have to be resilient. They're going to have to be capable of connecting electricity and water with international foreign systems. They have to be trained to that level. You've just gave a good example of put it in the hands of a Guardian and Airman, and watch them perform. What's your thoughts on that?

Dr. Ravi Chaudhary:

Our Airmen and Guardians have been innovating for over 75 years. I have no doubt that when the time comes, they will be ready. They're ready today. They're ready to go today. It falls upon our shoulders to make sure that they're resourced and ready to go. Take a look at our history. Starting from the first aerial refueling, the first supersonic flight, the Tuskegee Airmen, GPS, precision guided munitions, fifth gen, and now soon sixth gen capabilities. Our Airmen and Guardians will make it happen for us. We've just got to make sure that they have the budgets they need, that they have a budget, foot stomp right there, and are ready to go at a moment's notice. But that means we've got to take what we're doing and resource them with the right capabilities going forward.

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

As you forward deploy, obviously, we're not going to have superiority of air, potentially the space at the moment, but yet you have to insert them anyway and you're going to bring this multi-mission capable team. Today's tankers, today's airlifters may not be what we need for tomorrow. You came on this stage last year and you introduced blended wing body capability. What was your vision then, and how is it shaped for the ability to insert like a microreactor and bring it into a theater in a contested environment?

Dr. Ravi Chaudhary:

Yeah, absolutely. When we talk about contested environments, making sure that our Airmen have the capabilities they need to enter into a zone that is contested will require that they have the right logistics tail to go into that contested environment. We ought to pre-position and make sure that we're ready just outside that environment to give them the loiter capabilities, the range, the payload sizes they need to execute their mission. Increasing payload and range gets right back to our operational energy discussion. When we announced the blended wing body aircraft, that to me represents a vision for how we're going to increase our operational energy consumption in the future. Now, the blended wing body aircraft, and I have a little miniature of it right here if you want to focus in on it. Take a look at the wingspan of this aircraft. It's very unique. It's a combination of flying wing as well as conventional aircraft, but what you see is a body that produces lift.



Proceeding with this design, we're going to do a demonstrator prototype by 2027. We announced, of course, in August JetZero as a select lead for that effort. That capability, which we've studied for roughly about 15 to 20 years, could present upwards of 30% fuel savings for transport aircraft. We're seeing how it will fit into our analysis of alternatives for tanker aircraft. Everything's on the table in terms of the potential for transport aircraft. But if you talk to General Minihan, he is super excited about this technology. He's very interested into it, but we want to make sure that it has a right place. The great thing about this prototyping effort is that we're going to get matched from industry and external funders at roughly 40 to 50%.

It's exciting. We just cleared our first funding round and the match was cleared, but the matching is going to grow going forward, and we're super excited about doing what we've done as Airmen for decades, design, build and fly outstanding aircraft that meet the moment for our Airmen and Guardians. We're just super excited about this, but it represents a sea change, not only in operational capability, but transportation itself. We have a lot of interest out there. We're excited about it. And in the coming months AQ will be assuming the lead to make sure that we acquire this system in a disciplined fashion.

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

Connecting at home, domestic to international, you mentioned industry and industry partners, how valuable they are to you. I'm going to take us to Tindal for a second. I think of the partners like Florida Power & Light and so forth. What message would you give them now based on all that you've been working with, what's your message to our industry partners, especially regarding the installations and lessons learned?

Dr. Ravi Chaudhary:

It's very simple. We are thrilled to partner and we're excited to partner and we want to do it more. Great power competition is going to demand that we not only have resilient installations, but the communities surrounding those installations are resilient as well. The connectivity between energy and power between our installations of local communities are not mutually exclusive. If you think about it, right now a cyber attack could impact the local community more than it does the installation. Having a symbiotic relationship is really the future of how our installations are going to operate going forward. We are busy working hard and ensuring that those community partnerships are robust. I have a community partnerships team that is on it every single day. They're looking for ways to partner. We have a resiliency team that's looking for ways to partner, and we are excited to do more of that in the future.

We're getting ready this spring to announce and release a installation infrastructure action plan. Very good keyword is action. We're going to take actions that ensure we are ready in great power competition and take us in directions that make our installations more resilient and more survivable going forward. But again, I harken back to the original story of what great power competition is going to look like in the next decade. It's going to transcend the dime and require our installation to work closely with our communities. There may be situations where the installation assists the local community. We get the jets out of town, and then as we fight the base going forward, assisting with grid stress, ultimately brings returns back to the installation. That relationship is going to have to grow, and we're going to have to recognize that. The DAF has an incredible civic leaders program. I was talking with all of our civic leader partners. They're all fantastic. They all want to know how to help.

One of the things that I brought up in our discussion was that it's not about potlucks anymore. We need more investment. We need more connectivity. We need better partnerships to address the challenges



that our installations face. And some of them are very, very real. As you know, it is been in the press, the discussions of various installations that have encroachment issues.

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

There you go.

Dr. Ravi Chaudhary:

Particularly from unknown actors, and that uncertainty is something that we can help with. Addressing those things aggressively, crisply, are going to be key in the future.

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

I don't want to put words in mouth, but you're constantly looking at local investments, state level investment in their installations. They're obviously looking at you to make sure that your investments also match with their wants and needs.

Dr. Ravi Chaudhary:

Yep.

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

How well-matched do you feel you are?

Dr. Ravi Chaudhary:

I think there's a lot of opportunity for synergy here. When you come together on challenges, it's amazing what you can do as a nation. Right now, we have local communities that are coming together, taking DoD opportunities, matching them with state and local opportunities, be it Bipartisan Infrastructure Law or IRA, and then matching them together to do really, really great things. Just think about if we did that in a stovepipe. We couldn't be as great. But ultimately that's the wave of the future. I want to encourage more of that and we have a great team poised to facilitate those efforts if there's interest out there.

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

Yeah, especially if you're leveraging the investments, whether they're private investments, debenture or whatever. But your investment eventually leads to the success and a center of excellence. But I would imagine your mind for a great power competition, you're constantly thinking about how it's going to make our war fighting capability successful going forward.

Dr. Ravi Chaudhary:

Yeah, absolutely. I'll give you an example. Here's a really great example. Up at Fairchild Air Force Base, there was an incredible need for a marksmanship shooting range and the local community, the local sheriff's department came together with Fairchild Air Force Base to establish a common range off base. It's a state-of-the-art facility, but matched funds allowed us to avoid \$10 million in MilCon, which would've taken a lot longer. MilCon is a little more long lead of a funding stream than others. When they came together with the local community, they just broke ground on it. It's a fabulous facility. Now we can meet our war fighter requirements and at the same time have that synergy with the local community. I've got a team that is leading so far forward on this, we have a saying in our organization,



"We eat no for breakfast." If somebody says no to us, we're going to find a way to solve a problem, build better connections and meet our mission requirements.

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

What's the wave of the future of hydrogen fuel cells?

Dr. Ravi Chaudhary:

We're going to take a wait and see approach here. Some technology items... One of the things that we're doing is assessing various technology levels and its benefit to the war fighter today. One of the things that I get asked a lot, especially when it comes to carbon free energy, climate change, or reducing emissions in our aircraft... Of course, we're one of the largest producers of greenhouse gas emissions. What I always say to them is that while we're looking to move forward with the carbon free environment, we're not going to sacrifice an ounce of operational capability.

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

Very good.

Dr. Ravi Chaudhary:

Making sure that our readiness stays where it is. I always equate it to aircraft, "Listen, it's great. We're going to do things that reduce our demand and our greenhouse gas emission footprint. We're going to reduce that, but I'm not going to trade in an ounce of thrust for any sort of capability that could reduce readiness." That comes from my pedigree as an air crew member. I've had the opportunity to be thrust-efficientist in situations. I always want to clear the trees and I want to make sure that folks that are out there flying aircraft and executing the mission every day clear those trees too. I'm just not going to sacrifice readiness for opportunities to reduce greenhouse gas emissions.

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

Yeah, wonderful. We have probably two or three more minutes and I'd like to tell our audience, please get ready for with some of your questions. I think those will be important because you're now going to be a part of the dialogue. But let me ask one more question. Okay, what other alternative energies are out there?

Dr. Ravi Chaudhary:

Yeah, that's cool. There's some really great opportunities that we're taking a look at. One is geothermal. The impact of geothermal can have a outsized benefit to our installations going forward. We're doing that at a couple of places. We're looking, doing some studies at F.E. Warren. We're doing it at Joint Base San Antonio. Those things are beneficial to us as well. One of the things that we're also focused on is non-traditional energy storage. As you know, lithium batteries are the resources that enable them are from countries that could be adversaries to us. We want to make sure that alternative battery storage capabilities are things that we look at. We work closely with DIU. We work closely with AppWorks to look at alternative capabilities that allow us to be more effective in the future. Leaning forward is critical to us, and we know that it's going to bring gains for us in our installations.

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



That's where Doug Beck and the DIU team and everything else is really leveraging, let's say, some of the entrepreneurial small business capabilities, that R&D that we want to capture out there.

Dr. Ravi Chaudhary:

Absolutely. The DIU team and Doug Beck have been phenomenal. Of course, blended wing body was seated in DIU. They have a very strong energy portfolio, and I believe he recently testified about that energy portfolio as well too. We're working closely with them and we just recently asked them to say, "Hey, take a look at energy storage. This could be critical for us in the future and we want to make sure that we're ready to meet the moment."

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

Well, I've asked enough questions, it's time to hand it over to the jury and the audience. I like to open it up, and please, let's start with Dave Roza from Air & Space Forces Magazine. David, are you back there? Thank you.

David Roza:

Yeah. Hi, can you hear me okay?

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

We can definitely.

Dr. Ravi Chaudhary:

I can hear you.

David Roza:

Great. Thank you so much for chatting with us today. Two part question going back to the microreactors. One, is there a timeline in mind for when that experiment will start at Eielson? And two, are there other bases in mind for expanding microreactor experimentation?

Dr. Ravi Chaudhary:

Thanks for that question. Right now, our timeline is tracking towards 2027 for deployment. We're waiting on the prime contractor, which is Oklo to publish that schedule. They're keeping that metric in mind. We're going to take a wait and see look on this particular capability to ensure since it's so new and so leading edge, that we're going to take a look and see where it might benefit us the most. I get lots of interest across our installations on microreactors, particularly overseas locations. My eyes are wide open to this, but we want to make sure that we have a viable technology that's ready to go ahead.

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

Question please. Microphone over here, and please your name and where you're from.

Michael Marrow:

Hi, Michael Marrow with Breaking Defense. I wanted to ask about the current continuing resolution. We've been under one for almost half the fiscal year now. How has that impacted your priorities? As it's stymied anything? You had to put anything on hold as this has dragged on?



Dr. Ravi Chaudhary:

Well, we're very grateful to have a MilCon resolution at that point. But when it comes to new starts, absolutely this is going to impact our energy resilience capabilities and our initiatives. It could touch our portfolio in any number of ways, but I can tell you one thing, a continuing resolution is not beneficial to our ability to build more resilience into our installation. Hopefully, that... It's pretty plain and simple, if you ask me. A CR is going to be detrimental to our installation capabilities.

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

You bring up a key point. We need to all advocate for steady funding for our services. Question here, please.

Jimmy Canlas:

Hi, Jimmy Canlas, "Vegas," here. Dr. Chaudhary, thank you so much for all that insight. You brought up a term earlier with joint basing, right? It's been around for quite some time. I think the picture of where we're going as an Air Force is pretty clear. Do you see areas of divergence with those joint bases that may not be Air Force led and how to compel them to move in our direction?

Dr. Ravi Chaudhary:

We've got to fight as a joint team, period. That means that joint bases are critical to executing our operations. Sometimes tension occurs when it comes to priorities, when it comes to individual needs, but they can quickly sink into a parochial discussion. We don't want that. We want any tension to be centered on doctrinal needs. For example, if we have Airmen and Guardians that are better suited, that understand the operation of an airfield. Well, we want to make sure that those capabilities are preserved. Same thing for maritime capabilities. Ultimately, if we were to move as a stovepipe, we wouldn't win. We know that. We've learned that lesson.

Our installations have to operate in a joint environment. Our commitment to that is unwavering and we're going to continue where there are disagreements and disagreements do occur, that we energy up our governance to make sure that issues get solved at the lowest level and we're brokering issues that warrant getting to higher levels. We're actually taking a close look at our joint bases and from a doctrinal standpoint, ensuring that we have governance that's effective, that's ready to execute OPLANs in their current state. Taking a look at that is important. Thank you for bringing that up. It is absolutely critical. But as a former joint base commander, I know that's an issue that's close to your heart. But we're going to be joint, period.

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

Open questions. Tobias, please.

Tobias Naegele:

Hi, Doctor. Thanks for being here. You talked a little bit about weather and you talked about continuity. Agile combat employment is going to depend a lot on remote bases, island bases, and most islands are at great risk of storm damage. You think about Puerto Rico or you think about Guam a couple of decades back. How do you make sure that ACE works not only through weather, but if the grid is really a weak spot that it works through attack on that grid and Guam stays operable or other islands in the Pacific.

Dr. Ravi Chaudhary:



The simple answer is stay focused on it. Make sure that it's part of our crosscheck. When we think about expeditionary operations, when we talk about how we're going to employ Air Task Force going forward, how our employed base command will be ready to meet those challenges. Bringing that into our crosscheck is going to be critical. One of the things that we're going to be releasing about, and it's a little peak under the tent, is upping our interest and focus on installation energy plans. We do have responsibilities to write them, but resources don't always allow us to get after it as quickly as we can. You'd be surprised once you lay down a plan for how you're going to handle energy, how quickly you can get to solutions, be it a industry solution, a privatization solution, or one that requires us to build more redundancy or look for alternative sources of energy. Unveiling that is part of the plan and staying on top of it is something that we know commanders will be focused on going forward.

Tobias Naegele:

If I could just quick follow to that, does ACE then really depend on generators, and if so, how do you get beyond the classic diesel noisy generator outside the tent?

Dr. Ravi Chaudhary:

I would say it's going to land someplace in a hybrid because having a single source of energy as a backup may not be the right way to take us to the next level of redundancy and resilience in installation. But you bring up an important point, one that we're going to have to consider in the future, and that's what these installation energy plans are going to sift through in the coming days.

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

John, hold on one second. We'll get you.

John Simmons:

John Simmons with The Roosevelt Group. I appreciate the comments about working with communities, partnerships, power. Communities are very interested in trying to help the Air Force with the electronic vehicle, government mandate trying to roll it out. They're moving fast, they're working with industry, but it costs money and you have a limited amount of money. What are your thoughts on using IGSA's, the intergovernmental service agreements that allows them to reduce the cost and amortize it? If you're going to take advantage when you've got big bases in big cities that want to work with you, should they be trying to contact your office? Who's going to run that?

Dr. Ravi Chaudhary:

On the intergovernmental service agreements, you're talking IGSA?

John Simmons:

Yeah, IGSA's.

Dr. Ravi Chaudhary:

IGSA's, okay. Yes, contact the installation. Say, "We want a partner." Specific on the EV piece. My general sense is that the DAF will be taking a measured approach on this. We have to make sure that we have the right infrastructure, but it also comes with understanding the rate at which our market is moving in electrical vehicles. Of course, we're talking about non-tactical vehicles at this point because there's a broader question of tactical vehicles, and we're going to follow the Army's footsteps on this area. But



when it comes to non-tactical vehicles, taking a measured approach, understanding how the market is reacting going forward, there are indicators out there that certain companies will only be producing EVs by 2035. That presents us with a reality of how we're going to contend with that demand signal going forward. Being measured about it, not investing too much, but investing the right amount. I think, in general, starting with infrastructure is what the DAF is doing right now.

John Simmons:

Right, and there's \$300 million sitting there that's been appropriated through other funding and it's like, "Well, don't miss out on leveraging someone else to help pay your bills." Thanks.

Dr. Ravi Chaudhary:

This is true. Thank you for that feedback. Great.

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

We're good. We have a question over here.

David Olive:

Secretary, David Olive with Catalyst Partners. You talked a lot about community partnerships and private sector partnerships. Do you see the Air Force pushing forward on those things with regard to off-base dormitory housing like they've done at Cannon Air Force Base?

Dr. Ravi Chaudhary:

What an outstanding question, and I really appreciate you highlighting dormitories. As you know, there is GAO study that came out in the fall. The GAO looked at two DAF installations among 10. I've been to 35. In fact, I was just at one yesterday and I want to foot stomp this. The DAF is going to invest \$1.1 billion in our dormitories from FY22 to FY26. I want that to sink in because I want any Airman or Guardian watching to know that your DAF is committed to supporting your quality of life. Now, from a broader standpoint, we have a dorm master plan that looks at where our greatest needs are and where deficits are. And in those cases, we are investing and looking at local options for development. For example, Cannon is one of them where we have development and we're looking at least options for those locations where it makes sense to address a, particularly, shortage.

We're also looking at partnering with local colleges to provide some alleviation as we're building new dorms with MilCon and renovating others. I think we have 60 installations over the five-year planning in terms of projects with renovations. 23 plan just in FY24. If you're wondering about what a CR does for you, that means those 23 projects don't happen. That's quality of life for men and women who serve. From a more broad perspective, we're taking a look at privatization options as well too. That's inside and outside the wire. We have a particular model that we're working on, and once we get approval for that, we'll have more to say about that. But we want to make sure that we're looking at the full range of options to meet our needs going forward. The commitment from the MAJCOMs has been indisputable in terms of what we want to get after, and dorms is one of those.

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

Ravi, just a last question. The grids are not... Especially here in the United States, are pretty fragile. Then we also have the vulnerability of cyber attack on SCADA and so forth. Obviously, the ability to deliver. Does your plan of the future, this strategy, include those risks and risk mitigation?



Dr. Ravi Chaudhary:

We know one thing that our adversaries have clearly stated their intent to disrupt our control systems in our communities and at our installations. The FBI director recently testified on this threat, particularly from a cyber standpoint. That means that our ability to harden against this threat is one of my top priorities, and that's what GPC, the analysis we did, GPC aligned our priorities too. Ensuring that we address these challenges going forward is going to be our top priority and making sure that our installations are survivable, resilient and ready to execute their mission. Yeah, absolutely.

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

Well, we have a couple of minutes remaining. Really, any just take away thoughts that you want us to bring home. It's over to you.

Dr. Ravi Chaudhary:

Yeah, thanks for that, Doug. What an awesome-

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

Thank you.

Dr. Ravi Chaudhary:

... hour to spend talking about in a really important subject, something that our team is focused on going forward. But it goes all the way back to Hap Arnold, who stated this in 1941. "Our air bases are the determining factor in the success of air operations." Think about that. 1941, we knew it. If we're going to be able to project power from air forces to space forces, to expeditionary CONUS/OCNUS, the full range of responsibilities to include joint basing, we're going to need to make sure that they're resilient, ready and survivable. I have a team, I have an enterprise that is committed to this, and they ready to take bold action to move forward in the future. We can ill afford, and our secretary is adamant about this. We can ill afford to move at the speed of government when technology is moving at the speed of the threat. I'll leave you with that commitment, that thought, that bogey for us going forward to ensure that we have a ready and committed DAF that is going to meet the commitment of great power competition.

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

Well, Dr. Ravi Chaudhary, once again, what a privilege and an honor to have you on the stage, to be able to talk to us about the most important part about great power competition. Having the forward momentum and the energy to get there, to fight and win. That's key. Thank you.

Dr. Ravi Chaudhary:

Thank you, Doug, for having me here today.

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

Thank you to our audience, both online and here in the room today. It's been a real privilege to have you as well. Don't forget to join us next week as we talk with the honorable Alex Wagner, Assistant Secretary of the Air Force for Manpower and Reserve Affairs. It's not too late to register. Scan the QR code on the screen or just go to afa.org and search under events. Please. Let's give Dr. Chaudhary a big hand. Thank you.