



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

Air Force Materiel Command's mission is to power the world's greatest air force, to develop, deliver, support, and sustain war-winning capabilities with a clear vision as one team. The Command is focused on delivering integrated capabilities, strengthening the AFMC team, revolutionizing AFMC's processes in support of mission, execution, and amplifying AFMC's war-fighting culture. Delivery of the B-21 Raider on cost, on schedule and performance epitomizes the Command strategy. Thank you. Not only is the Command delivering on the B-21, they do this for nearly every weapon system in the Air Force inventory, both current and future.

Ladies and gentlemen, please welcome the Commander of Air Force Materiel Command General Duke Richardson.

Gen. Duke Z. Richardson:

All right. Good morning. I'm honored to stand here today as your Air Force Materiel Command Commander. It is my privilege to lead this team of 89,000 civilian and uniformed Airmen. This highly skilled team executes 45 percent of the Air Force budget. In the machine of our nation's defense, we are the powerhouse. We power the world's greatest Air Force.

We research, develop, produce, test, and sustain nearly all Air Force assets. On top of that, we build, sustain, secure, and modernize our installations. We are the architects and the keepers of the nuclear and conventional weapon systems that backstop deterrence. We are focused on the Air Force of today and tomorrow. Outpacing and deterring the People's Republic of China starts with AFMC. We're working double time to get after Secretary Kendall's operational imperatives. This urgency lies in China's progress in reducing their time to field new weapons systems. Accelerate, change, or lose. It's not just a bumper sticker to us. It's our call to action. The Air Force relies on creative AFMC Airmen to deliver capabilities faster by leveraging every available tool. All six of our AFMC centers play a crucial role operating as one team regardless of functional affiliation or geographic location. We're focused on enterprise solutions, digital material management and collaboration with our war fighters across every MAJCOM for every weapon system.

As just one example, we've been working hard on the development and fielding of the B-21 Raider. We've done this by utilizing our six purpose-built centers in concert with the Department of the Air Force Rapid Capabilities office. The B-21 program exemplifies our commitment to delivering integrated capabilities, covering all aspects of the lifecycle from research and development through acquisition and testing, to long-term sustainment and support. AFMC is doing our part to ensure the B-21 is ready to defend our nation. We'll test it and field it within a threat relevant timeline and we'll modernize and sustain it for the long haul. Our work in the B-21 program embodies Air Force Materiel Command's core principle; every individual capability, every piece of technology we develop must maximize readiness and lethality, not just on its own, but as part of an integrated whole. AFMC partners closely with the DAF RCO and provide 70% of the program office team.

Today, our AFMC Airmen will narrate their role in bringing the B-21 to life. Their stories will be conveyed through the lens of each center. The Air Force Research Lab is working diligently behind the scenes on the B-21 program, ensuring we have the edge. AFRL reduces risks to all our programs of record through targeted tech maturation. Our AFRL scientists and engineers span disciplines ranging from materials to air and space vehicles and everything else imaginable. Let's hear it straight from our on-call experts in AFRL.

Kara Storage:

In AFRL/RS, we provide accelerated MMP solutions, so materials and process solutions, and manufacturing for the B-21 for multiple systems and programs, but especially B-21. That breaks down to materials testing, environmental exposure, fabrication, and then making and breaking, of course, test specimens, then analyzing results. We also engage with the customers for transitioning technology, so this could be inspection, things like that. We also help enable accelerated qualification of materials. We actually have co-located engineers who sit in certain of the program offices and are liaisons, and so we do have one in B-21 as well as some others, and so work with those folks to identify needs in the materials and manufacturing area. So helping with down selection, qualification materials, as well as supportability and sustainment needs. So helping for B-21 future needs and trying to help define how the materials will perform in what sort of environments that the weapons system will see.

So we do that for our existing platforms. We do focus on sustainment and then modernization. The team working together to get a new system supportable and maintainable. So yeah, being a part of Global Strike Command, AFMC, all of AFRL, all of us working together to provide the technology to help the Air Force. We are an affordable and an unbiased lab for analysis. It's definitely fun to come to work every day, working a wide variety of problems and delivering solutions. We power the world's greatest Air Force by providing MMP and manufacturing solutions in accelerated manner and transitioning next generation game-changing technologies.

Gen. Duke Z. Richardson:

The Air Force Research Lab invents novel technologies not yet discovered for programs not yet thought of. AFRL's innovations translate to improved aircraft performance, operational efficiency, and enhanced mission success rates. Now, as technologies are developed, the Air Force Lifecycle Management Center gears up to acquire and support war-winning capabilities. LCMC houses nearly every non-nuclear program office in the Air Force. LCMC designs, develops, produces, and modernizes Air Force weapons systems, engines, and subsystems. Our team at LCMC provides war-fighting capabilities at the speed of relevance, and the B-21 is no exception.

Maj. Maribel Gonzalez:

As a team lead, I'm charged with guiding the IPT through the development, testing, and fielding of affordable, survivable, and secure CNI solutions for the B-21. We're also charged with establishing modernization initiatives for the CNI subsystems in alignment with the B-21 modernization roadmap.

Clancy Shepard:

So I'm dual-hatted on the program. I work for two completely separate teams. One is the systems engineering team and one is the test team. Systems engineering is looking at the system as a whole instead of looking at its different individual components including requirements, systems, safety, airworthiness, human system integration, everything that touches the entirety of the aircraft and helps integrate it, that's what systems engineering is.

Marcus Barnes:

They plan every detail out to the T. So affordability on the backend is our main driver. So we're making sure that what we're spending our money in today can be used in the sustainment period of the B-21 in 50, a hundred years, and that we take into consideration, truly, what the war fighter needs.

Clancy Shepard:

So we have to find a balance between costs, schedule, performance, safety, and security, really. We're going through and executing that process of risk acceptance so that we can go and actually fly the aircraft.

Maj. Maribel Gonzalez:

The B-21 modernization program is intended to address VMSMS, the issues down the road and also keep up with the pace of technology.

Clancy Shepard:

Usually when you're first building and prototyping aircraft, you use more hands-on techniques. So one of the things that we've done on this platform is making sure that we're using projection representative manufacturing processes so that when we actually get into production, we're ready to go and we've reduced the risk.

Maj. Maribel Gonzalez:

There is one aspect in which the LCMC and AFMC support is key to the partnership with the RCO and is the organized training equipped aspect of running a team.

Marcus Barnes:

It's a rigorous task. They make sure that the people that come on board are qualified, have good backgrounds, and making sure that they're eligible to do the job and can do the job at a high level.

Clancy Shepard:

We are here to get Global Strike what they need when they need it, and we're here to communicate their requirements to the contractor to help get the right capabilities at the right time.

Maj. Maribel Gonzalez:

Something else that's unique about this program is the early and often involvement of the war fighter in everything we do. Coming from traditional AFMC programs, I know that that is the goal for most programs out there, but it's not always achievable because while they're trying to go fast capturing test and war fighter input early on, resource constrain the plans and that is a problem that B-21 does not seem to have.

Marcus Barnes:

There's definitely a sense of pride in this job because when you work in a skiff, you're in an isolated community, so you get really close with the people you work with and you have a sense of pride coming to work every day knowing that what you're doing today is helping the war fighter tomorrow.

Maj. Maribel Gonzalez:

We power the world's greatest Air Force by continuing to execute our day by day duties under that, yes, if mentality.

Marcus Barnes:

Send the funding documents, making sure that we're using the right appropriation based on the fiscal laws policies, and it's within our budget that we were allotted.

Clancy Shepard:

By being bold, innovative, and courageous, and delivering the war fighter what they need.

Gen. Duke Z. Richardson:

LCMC ensures the B-21 is airworthy and meets all Air Force Global Strike Command requirements. Thinking more broadly, LCMC certifies every Air Force weapon system is safe, secure, effective, available, and sustainable. Now, on a similar note, the Air Force Nuclear Weapons Center does everything LCMC does, but for nuclear programs. In addition, the Nuke Weapons Center accomplishes all nuclear certifications working closely with other government agencies.

In the upcoming video, our Nuke Weapons Center Airmen showcase the Center's pivotal role in deterring our enemies and assuring our allies.

William Ramos:

So every nuclear system that the US Air Force has is nuclear certified and that is what my office manages and helps program offices navigate. We have, I'll say, about a 10,000-step process that we understand and we help to decompose that for programs so that they don't have to track it as closely as they normally would. So managing each step of the process and understanding what the schedule is to ensure that certification aligns with the initial operational capability of the system. You'd also see the team conducting technical assessments of the design to ensure that it meets the requirements to be nuclear certified, to ensure the system is safe and reliable. It's a difficult job because we have to balance both risk and capability along with the surety, and that's a difficult thing to articulate to senior leaders.

So the B-21's unique because it's probably been about 40, 45 years since we've done something on this magnitude and of this significance. Most of the systems we work on are sustainment activities, and so the deterrent value is already available to the US national defense. With B-21, we're providing a significant improvement in deterrence to our nation. We have made significant improvements. We've modernized our process. We've added digital material management within our process. The nuclear enterprise has had a deficit in knowledge over the last 40 years as we haven't done this very often. So pulling resources from the entire MAJCOM is important to getting the job done.

We're learning to be more flexible within what historically has been an inflexible community. Again, with the nuclear weapons, they're special. They require a different level of rigor and risk acceptance, but even with that process, we have the ability to increase our flexibility to maintain pace with the acquisition, but ensure that the same rigor is maintained. This will probably be a model for other acquisitions that we're already working in. So the lessons we've learned through B-21 are being applied to other systems now. So nuclear certification is a lifelong, for the system, process that it must undergo. So every time they modify or change the system, we have to take another look at it and make sure that we don't defeat any of the certification activities that we did before.

What we do is vitally important to our nation that we have a credible deterrent, but that we also have a safe deterrent. We power the world's greatest Air Force by ensuring our nuclear deterrents are never doubted and always feared.

Gen. Duke Z. Richardson:

The Nuke Weapons Center is tasked with the responsibility of ensuring the Air Force nuclear capabilities are safe, secure, and effective. Yet, prior to deploying any of our weapons systems, both nuclear and non-nuclear, each must undergo a rigorous evaluation conducted by the Air Force Test Center. This thorough process ensures the system operates efficiently and maintains unwavering reliability. Our Test

Center executes developmental tests on nearly all Air Force weapons systems to ensure performance meets requirements. Our testers inform capability development and new program start decisions by assessing prototypes and conducting experiments. Now, we'll hear directly from a Test Center B-21 test pilot and maintainer as they share how they've translated this into action.

Lt. Col. Clifton Bell:

Being a test pilot is definitely a group effort across the board. You have a Lifecycle Management Center provides the engineering expertise to the program office. So before I'm even thinking about flying it, we have engineers making sure that it's been designed to be a flyable and executable aircraft. Then they're watching to make sure that the aircraft is built according to that design. And then you have your contractor. We in the Air Force build very little without our prime contractors. They do a lot of the early engineering, the design, and the build. So as we go through all of the different aspects of putting an aircraft together, it is a massive team that brings it together.

And then when you get to the flight test portion, we execute the program for the engineers in the control room. Now, I have the final call on safety inside the aircraft if I feel like something's going wrong. But the reality is, if I move the stick, if I do something that's been pre-coordinated, we're working with the control room, they're watching all the parameters of the aircraft, making sure that everything looks as expected and that we're not running into any unexpected events. And if we have that unexpected event, they're there to help us get out of it and land safely and return home.

Master Sgt. Darryl Gaines:

So I have a team physically there interfacing with the Northrop Grumman counterparts and actually standing beside them, wrenches on airplane, actually installing the parts, installing the lines. Also have a team here standing up the facilities and actual maintenance unit, whether it be setting up programs, acquiring vehicles, acquiring tools, tech data, all the things we need to actually accomplish the mission. We're actually reaching out, getting that done so that when the plane does get here, we actually know what's happening. We know how to execute and we get the job done.

Lt. Col. Clifton Bell:

A lot of acquisitions, if you read the acquisitions book, is done in a fairly serial process. We found that oftentimes that leads to missing things that have to go back and fix. So the way this program was built from the ground up, I started on the program in 2016 providing test pilot inputs to the design of the aircraft to make sure they aligned with what the user, Global Strike Command aircrew said they needed and wanted. So those combined with the engineering that comes from the Lifecycle Management Center in AFMC, we're able to balance as best as possible all the different attributes of an aircraft that can make it successful for decades to come.

Master Sgt. Darryl Gaines:

Without that intimate kind of subject matter expert insight to the process that the maintainers bring, you'd be left with an incomplete product. Engineers are wonderful, but they see problem and solution. They don't see the intimate nuances that come with it. So they may develop something that works on paper and then a maintainer looks at it and actually goes through the motions. This may work for me this time in a controlled environment, but when we get to an operational setting or a deployed setting, this may not work. As seasoned maintainers who have deployed and have that experience, we can bring that knowledge to the engineers and have them develop around it with that insight in mind. Plus, we

have the support of Air Force Global Strike and AFMC to make it happen. So whether it be people, parts, equipment, we got support at all levels.

Lt. Col. Clifton Bell:

We power the world's greatest Air Force by accelerating acquisition of the next generation strategic bomber.

Master Sgt. Darryl Gaines:

By bringing subject matter expertise from the operational field to the test environment.

Lt. Col. Clifton Bell:

To deter would-be enemy aggressors around the world, and when necessary, to hold them accountable.

Gen. Duke Z. Richardson:

The Test Center puts the B-21 through a combination of realistic simulations, intensive exercises, and carefully designed evaluations. This process goes well beyond routine testing and dives deep into really understanding the capabilities. The Test Center stresses our systems to determine failure modes and maintenance challenges in a controlled environment vice during war. Now, after it departs the factory, the B-21 assumes a new phase with sustainment and maintainability in mind, transitioning from developing, acquiring, and testing to maintenance. Our Air Force Sustainment Center steps in to provide essential logistics support. Our AFSC team ensures the B-21, once fielded, will be ready and available to deliver formidable combat air power. AFSC does this through depot maintenance on aircraft and engines beyond what Blue Suiters can do on the flight line. Watch now as our sustainers showcase their wrench-turning stories.

Laura Hazen:

We have been involved in the program since pre-source collection. We actually had multiple technical experts working with the Rapid Capabilities office to be part of that process, to really talk about lessons learned that we've had on previous programs and to help to develop plans to make sure we had a good process for the future, really focused on long-term sustainment, but also driving capabilities today.

Ken Lybolt:

Yeah, we are the entry point for the program office to help us establish the core capabilities to sustain this aircraft over the lifecycle of the airframe.

Milton James:

We're talking about the newest advanced aircraft in the Air Force inventory. So yes, there will be very specific tasks that will be completely different than what we do normally, but we have experienced technicians. There's specific training we need to have. We'll make sure that all the mechanics are trained, and then if there's specific equipment we need, we'll make sure that we purchase all the specific equipment that we need to manage this workload.

Durrell Hodges:

Most of my work is in software integration and tests, working with the contractor, the suppliers, and all of the software developers to integrate the software and hardware that goes into the weapon system and then certify that software for release and test on the actual airframe itself.

Laura Hazen:

[inaudible 00:23:26] has been supporting weapon systems for 20, 30 years, and we took a lot of those lessons learned and built those into our strategies for how to really contribute to the B-21 program, and some of that is early embedded, being involved in the beginning.

Durrell Hodges:

As an actual Air Force engineer embedded with a prime contractor, I have the opportunity to learn unique skills that will be useful to the Air Force once this program makes it into maintenance and sustainment.

Ken Lybolt:

The program never really leaves our desk, we keep and follow the program through the life cycle of the whole airframe.

Milton James:

Program depot maintenance is the maintenance, repair, and overhaul of aircraft. We basically tear the aircraft down to longerons, basically to the skeleton, repair it, put it back together, repaint it, re-skin it, make it back to brand new, and then we send it back to the field.

Laura Hazen:

We have team members that have been learning and developing capabilities while we're also building capabilities here at Tinker as well to support not only the program right now in EMD, but long-term sustainment capabilities as well.

Durrell Hodges:

We have labs that are completely virtual. We have labs that have partial hardware and mixed with some simulation of hardware, and we have full-up labs that give us the most representative environment of the weapon system in order to ensure that the actual results are supporting the requirements that we have in place.

Ken Lybolt:

I was brought into the program as that maintainer from the flight line to hopefully make it easier on the future maintainers to work on this aircraft.

We work closely with supply chain to ensure whatever we plan to is supportable. The challenge is, as we maintain it, we have suppliers that go out of business, but within the complex, we've established different processes like our react cell that does re-engineering and critical tooling. They're able to go in and re-engineer parts that we're having trouble getting.

Laura Hazen:

Software's a little bit different than your traditional depot maintenance that the whole goal is to repair an item to its form-fit function. With software, software's never done. It's in a continuous development

process, and so we're continuously adding capabilities, and that's going to be the plan long-term for the program as well.

Milton James:

So we're standing in a hangar right now. This hanger was designed for a specific aircraft. The cost of building a hangar for a specific aircraft is very expensive. Why don't we look at being agile with respect to hangars, an example being B-21. They'll be using agile-combat hangars in the future. So we have the modernization program for the B-52. Would it be the best thing to do to use the agile-combat hangar that we have for B-21 and build it earlier and repurpose that and use it for the B-52 modernization? Already have the hangar, so we buy it once, we use it twice. Just imagine if we could use that concept across the Air Force.

Ken Lybolt:

You want that aircraft to have as little downtime as possible. So as we go through and establish the depot requirements and the maintenance requirements for this airframe, we got to keep in mind that it actually has a mission to do. This aircraft can't sit on the ground all the time. It's designed to do a specific mission, and we need to basically make sure that we're able to do that.

Milton James:

We, the Air Force Sustainment Center, power the world's greatest Air Force by sustaining the world's greatest Air Force.

Laura Hazen:

By providing organic resources that are really committed to the mission.

Ken Lybolt:

By establishing core capabilities and making data-driven decisions.

Durrell Hodges:

Making sure that our Airmen and war fighters have software delivered to their platforms that enables them to execute their missions and fly, fight, and win.

Gen. Duke Z. Richardson:

AFSC operates the Air Force's organic supply chain to ensure parts are repaired quickly and always on the shelf. AFSC also executes organic software factories to keep our software relevant and ever-evolving. Yet, the B-21 is unable to take flight without the Airmen of the Air Force Installation and Mission Support Center. IMSC provides critical support and infrastructure for our weapons systems. IMSC delivers, builds, and maintains our installations, the power projection platforms from which all our weapons systems operate. The IMSC team repairs and modernizes the facilities across all our installations, ensuring they're maintained at peak performance levels to support mission critical activities. Let's hear how our team is doing this for the B-21.

Jonathan Foman:

It's definitely a collaborative effort. We have tons of people involved in the B-21 bed down from requirements identification to the folks that finance it, to the people that manage the program as a



whole. Everyone has their piece of the pie and folks like us at DET 10, we're kind of a higher-level view and make sure all those moving parts stay connected and things flow from requirement identification to a manifested building for a plane to sit in.

Well, IMSC is involved from start to finish, and in some cases, even beyond. So it's a very comprehensive process. So we have to consider everything from environmental impacts to what makes the most sense for the budget. What can the program afford? Very long, extensive process to make sure we're making the right decisions for B-21 bed-down. And of course, for our taxpayers that are funding it. We work on the program level, so once the first hangar is done, that doesn't mean our job is done. So we hang out with this program for 10, 15 years, as long as it takes to get that bed-down complete where all our planes are in all of our buildings. So we're not making this up as we go along, we have a history of bed-downs that we're pulling from and we're learning our own lessons along the way to add to those best practices.

I wouldn't say it's an easy job, but I would say with the team members that we have, the incredible talent and experience that our people involved with the B-21 bed-down have, I would say it's as humbling as it is as rewarding being part of that, but it definitely keeps us challenged. We power the world's greatest Air Force by ensuring the facilities and its important infrastructure's ready when those new weapons systems get here.

Gen. Duke Z. Richardson:

IMSC ensures the bed-down of new weapons systems by executing new military construction and installation upgrades. IMSC's approach to installation management optimizes the Air Force's ability to rapidly deploy and sustain operations. So which of our six centers is my favorite? False. I love all of them equally. Our six centers work together to ensure our nation is optimized for strategic competition by delivering integrated capabilities. As with the B-21, if our Airmen fly it, shoot it, fuel it, move it, drive it, wear it, communicate with it, or work in it, AFMC powers every weapon system, every installation for every command and every Airman.

Quoting General Allvin, "I don't want to fight with just the tip of the spear, I want the whole spear, and that is what AFMC brings. If AFMC doesn't succeed, we all 100% fail." I wish to extend my heartfelt appreciation to the dedicated civilian and uniformed Airmen in AFMC. Our people make this Command. I am thankful and honored to be part of this team. With us today are some of the men and women who shared their stories. They represent the 89,000 AFMC Airmen and Guardians who deliver results day in and day out. Please stand and be recognized. We do our best together. Our power is unmatched, and together we are one AFMC, powering the world's greatest Air Force. Thank you.