

Kendall: F-35 Rollout Marks U.S.-Australia Partnership Milestone

DEPARTMENT OF DEFENSE NEWS RELEASE (JULY 25, 2014)

Cheryl Pellerin

WASHINGTON—The official rollout of the first two F-35 Lightning II joint strike fighter aircraft for the Royal Australian Air Force is a milestone in the U.S.-Australia partnership, the undersecretary of defense for acquisition, technology and logistics said July 24.

Frank Kendall spoke during a ceremony held on the flightline at the Lockheed Martin aviation facility in Fort Worth, Texas.

“We join Australia, as one of our original partners, to celebrate this delivery and the numerous Australian contributions to the joint strike fighter program,” Kendall said. “For both our nations, this program represents an exponential leap in capability on the cutting edge of technology, and an integral component of our ongoing joint commitment to stability and peace in the Asia-Pacific.”

The two F-35A aircraft, known as AU-1 and AU-2, are scheduled for delivery to the Australian air force later this year. They will be based at Luke Air Force Base, Ariz., and used for Australian and partner-country pilot training beginning next year. The first F-35s to operate in Australia are expected by 2017.

The F-35 Lightning II program consists of a series of single-seat, single-engine, multirole fighters designed with stealth capability to perform ground attack, reconnaissance, and air defense missions. The three variants of the F-35 include the F-35A, a conventional takeoff and landing variant; the F-35B, a short take-off and vertical-landing variant; and the F-35C, a carrier-based variant.

Joining Kendall as members of the official party were Australian Finance Minister and Senator Matthias Cormann, Air Marshal Geoff Brown, chief of the Royal Australian Air Force, and Lockheed Martin CEO Marillyn Hewson.

Kendall told an audience of about 300 that it takes a community to accomplish something as significant as the F-35.

“In this case it takes a community of nations, it takes a community of companies, it takes a community of militaries and departments within the U.S. and around the world, and all of our partners. It takes a community of industry to come together,” the undersecretary added. “This aircraft is a testimony to our ability to do that.”

Kendall described a time two decades ago when he served at the Pentagon as director of tactical warfare programs under then-Deputy Defense Secretary John M. Deutch.

“John got a number of us together one day,” he recalled, “and said that he’d decided [to] start a new technology program called the joint strike technology program that would lead to a common set of aircraft, of which there would be three variants: one for the Marine Corps, one for the Air Force, and one for the Navy.”

Kendall said he didn’t think it would work, because the communities would never agree on what to do, or stay together on the agreement long enough to develop three such aircraft.

“Now, if John had said, ‘Also, we’re going to make it a little more interesting by bringing on eight international partners at the same time,’ I would have just thrown my hands up in the air and said, ‘Forget about it.’”

Admitting he was wrong, Kendall said the “fundamental reason [for the program’s success] is the capability that we’ve been able to develop and the cutting-edge capability we’re offering to all the partners, all the Services, all the nations involved in the F-35.”

The program’s eight partner nations and two Foreign Military Sales countries already have announced plans to procure nearly 700 F-35s. The program of record outlines the acquisition of more than 3,000 aircraft, defense officials said.

Many partners have ordered their first aircraft, and pilots and maintainers from the United Kingdom and the Netherlands have taken delivery of their first F-35 at Eglin Air Force Base, Fla., where they’re training with U.S. counterparts.

The communities supporting the F-35 have stayed together because of common values and shared interests, Kendall said, and because they are committed to having next-generation capability and a multirole fighter that all partners need and will be able to depend on for decades.

In his remarks, Kendall explored the nature of the F-35, which has overcome many issues since its first flight in 2006, by discussing the 1981 nonfiction “The Soul of a New Machine” by author Tracy Kidder.

The Pulitzer Prize and American Book Award-winning story is an account of the efforts of a team of researchers at now-defunct Data General, one of the first late-1960s microcomputer firms, to create a new 32-bit superminicomputer.

"At the time, Data General was in trouble," Kendall said. "A company called Digital Equipment Corp. had introduced something called the VAX. They were cutting-edge in their day, and Data General had to respond to this threat, so they launched a crash program to develop a new design."

Telling the story, Kendall explained the point in the book he considers relevant today.

"The program manager, the chief designer for Data General, realized the computer he was building was too complex to be understood by a single individual," the undersecretary said.

The designer realized that no single person could possibly grasp all the complexity involved in the design they were creating, he added, and the designer had to trust many others to design their parts successfully and bring the machine together.

"It's that complexity that led to a very successful product, and they were successful at the time," Kendall said. "It's that complexity that characterizes the product behind me," referring to a gleaming new F-35.

During one of Kendall's first office calls several years ago with then-Defense Secretary Leon E. Panetta, the undersecretary recalled, "[Panetta] said, 'Frank, why can't we make more things like the [mine resistant, ambush-protected vehicle]? Why is the F-35 taking so long and costing so much?'

"My answer was one word," Kendall said. "Complexity."

The undersecretary listed several of the factors that make the F-35 so complex: "Millions of lines of code, an incredibly integrated design that brings together stealth, a number of characteristics, very advanced sensors, advanced radars, advanced [infrared] sensors, incredibly capable electronic warfare capability, integration of weapons and integration across the force of multiple aircraft, and multiple sensors to work together as a team."

All of that integrated technology is unprecedented, he said. "You're talking about something that no one has ever done before, which will put us all a decade or more ahead of anybody else out there. And [it will] keep us ahead for some time to come as we continue to upgrade the F-35," he added.

Such complexity has led to the cost and the time it has taken to design and build the F-35, Kendall said, but also to the capability it represents. "That's why we're all still together," he added. "That's why all the communities I talked about have stayed with this aircraft."

As he ended his remarks, Kendall asked for a round of applause for the engineers and production workers who made the F-35 possible.

Kendall Again Appeals to Congress to Drop Sequestration

DEPARTMENT OF DEFENSE NEWS RELEASE (AUG. 5, 2014)

Jim Garamone

WASHINGTON—The most important thing anyone can do to improve defense acquisition has to come from Congress, and that is to get rid of the threat of another budget sequester, Frank Kendall, the undersecretary of defense for acquisition, technology and logistics, said today.

Kendall spoke to the Armed Forces Communications and Electronics Association's Defense Acquisition Modernization Symposium, which is looking at ways the government, the Defense Department, and private industry can work together to modernize defense acquisition. But he said Congress really holds the key and must "end the threat of sequestration."

"If there is anything that is killing us today, it is the threat of sequestration. We have been living in a nightmare budget situation," Kendall added.

Defense acquisition professionals, he said, can only guess how much money they will be working with in out years. Congress "bought a little time" in relieving sequestration in fiscal 2014 and 2015, "but it's coming right back in fiscal 2016," Kendall added.

"We're going to go through an exercise this fall where we look at what the president is going to submit and something that is in line with [what] sequestration is," he said.

DoD is going to have to obey the law, and the damage to national defense from sequestration will be huge, Kendall said. Sequestration is compounded by the fact that overseas contingency operations budgets will go away also.

"There is also the problem of not getting things like [base realignment and closure] and adjustments in compensation growth," the undersecretary said.

Congress also will not allow the Services to retire weapons systems like the A-10 Thunderbolt or to mothball some Navy cruisers. All this adds to the nightmare budget scenario for national defense, Kendall said.

"All those are bills to the department, and the uncertainty confounds us because we are reluctant to take out force

structure because we might be able to afford it later. We just don't know," he said. "Because we have uncertainty, we tend to hang onto things."

NAVSEA Leader Tells Officers 'Maintenance Is Key To Success'

SURFACE WARFARE OFFICERS SCHOOL COMMAND PUBLIC AFFAIRS (AUG. 11, 2014)

Navy Lt. Jason Bilbro

NEWPORT, R.I.—The Surface Warfare Officers School (SWOS) hosted Vice Adm. William Hilarides, commander, Naval Sea Systems Command (NAVSEA), Aug. 8, when he addressed a class of prospective executive and commanding officers.

During his remarks, the admiral explained the role of NAVSEA in the fleet.

"We manage a budget of approximately forty billion dollars", he said. "We have a wide variety of programs, but the bulk of our funds are spent building, sustaining, and modernizing the surface fleet."

The admiral then discussed the current position the Navy finds itself in—that of maintaining its technical competency from the deckplates up.

"The resilience of our Navy in combat rests in the technical competence of its officers, chief petty officers, and enlisted sailors," he said. "And it starts with maintenance. Get a mirror and ask yourself, 'do we really know our systems? How well are we taking care of them?' You should look for opportunities to make your crew do maintenance they are uncomfortable with. Don't let them just do the easy stuff."

"How will you know if yours is a successful ship? When INSURV [Board of Inspection and Survey] is an easy day for you," he said. "Because that means that you have a good maintenance program."

Hilarides closed his remarks with a final order.

"Take care of those ships and sailors," he said "Be ready for war—we never know where or when it is coming, so be ready at all times."

According to SWOS Executive Officer Cmdr. Michael Ray, flag-level involvement in the training and preparation of future leaders is important.

"The SWOS curriculum offers these officers exposure to a wide range of relevant fleet topics, but some of the most

valuable knowledge our future fleet leaders gain is from our flag-level visitors," Ray said. "Vice Adm. Hilarides observes, on a daily basis, the material and modernization challenges that await these officers in the fleet. His observations will be incredibly useful to them as they prepare for demanding shipboard leadership roles."

For more information about Surface Warfare Officers School, visit <https://www.netc.navy.mil/centers/swos/>.

To learn more about the Naval Education and Training Command, visit <https://www.netc.navy.mil> and www.navy.mil/local/cnet/.

Solutions Evolving for Budget Challenges, DoD Official Says

DEPARTMENT OF DEFENSE NEWS RELEASE (SEPT. 3, 2014)

Terri Moon Cronk

WASHINGTON—The Defense Department faces budgetary challenges, but solutions to those concerns are evolving, the undersecretary of defense for acquisition, technology and logistics said here today.

Speaking to military and industry members at the annual ComDef 2014 conference at the National Press Club, Frank Kendall outlined his concerns for DoD, starting with another round of sequestration scheduled by law to take effect in fiscal year 2016.

"I think we're in for a very painful process this fall ... to come up with a budget submission for the president that will be consistent with his strategy," Kendall said.

The United States is concerned, too, with the many and varied events happening around the world today, such as political unrest in other countries, Kendall said.

Technological Superiority

The undersecretary said he also is concerned with the U.S. military losing technological superiority in certain areas of warfare. "There are a number of reasons for that, but obviously the budget situation compounds the problem," he said. Such a loss can result from several factors, Kendall noted, such as the actions of other nations and their growing capabilities.

"It's quite clear [Russia and China] are building things that are designed to be effective against our objectives in the United States and anywhere else," he noted. "And they're doing a reasonably good job of it, particularly China. [U.S.] technological superiority is not assured."

Further, budget cuts in research and development are also problematic because they delay modernization and the time it takes to deliver supplies and equipment to the force, Kendall said.

But the undersecretary said solutions exist to the concerns he outlined.

"That's a pretty long list of problems. There's a lot of work to be done, but we are making progress," Kendall said. DoD's four-year-old Better Buying Power initiative, he said, is responsible for much of that progress.

Improving Cost Consciousness

"The idea underlying [the initiative] is the desire to improve our cost consciousness, improve the way we manage so we're focused on cost and not just spending, make it a core responsibility to drive down costs whenever we can, and to be more productive, efficient, and put better incentives in place for industry," Kendall said.

The Better Buying Power initiative's third phase is due to roll out this month and will focus on getting DoD "back to our products and what we deliver to our warfighters," Kendall said. "It's going to be about innovation [and] technical excellence."

Kendall emphasized that the United States is not alone in facing tightening budgets, noting many allies face similar fiscal challenges.

"We have a lot of democracies we're in this with, ... and I think we need to rely on that more and work together," he said.

Hagel Encourages Innovation, Adaptability to Maintain Edge

DEPARTMENT OF DEFENSE NEWS RELEASE (SEPT. 3, 2014)

Amaani Lyle

NEWPORT, R.I.—To maintain its technological advantage and stay on the cutting edge of technology, the United States must be willing to take risks in innovation and creative thinking, Defense Secretary Chuck Hagel said here today.

Despite ongoing national security challenges and uncertainty in Ukraine, Belize, Pakistan, Afghanistan, and growing tension in the South China Sea, innovation challenges remain and must be addressed, Hagel said during the Southeastern New England Defense Industry Alliance-hosted Defense Innovation Days conference.

"It's appropriate that we gather here ... on the shores of Narragansett Bay, as an area that's had a long history of innovation benefitting America's national security," he said.

The secretary noted to his audience of key decision makers, start-up company executives, homeland security experts, and other defense specialists that the nearby Naval War College had the foresight to analyze whether aircraft carriers could be used more effectively than battleships.

"With more than 300 simulated war games that sought to anticipate future threats, they developed the tactics and operational concepts that would establish naval aviation as an offensive force," Hagel said. "Their innovative work proved decisive throughout World War II, and beyond - enabling countless victories in the Pacific Theater and shaping the doctrine that put aircraft carriers at the forefront of our military projects, and our ability to project power all over the world."

Critical Ties

As New England emerges as a hub for undersea warfare, technology, capabilities, and future operational concepts, Hagel noted the critical ties to industry as the growth continues to support the Defense Department.

"The businesses that comprise our industrial base are as diverse as the troops they support, ... and like our armed forces, they are unrivaled around the world," he said.

Private-sector expertise also helps to give the U.S. military its technological edge and drives the economic strength that undergirds national power, the secretary said.

"From churning out over 100,000 combat aircraft during the Second World War ... to constructing the mine-resistant, ambush-protected vehicles that continue to protect American soldiers and Marines in Afghanistan, ... our men and women in uniform have been able to count on American innovation, American industry," Hagel said. "We've been able to count on them to make the tools we need to win in battle and return home safely."

Added Stressors

But building an industrial partnership wasn't an overnight process, Hagel asserted, acknowledging the added stressors of steep, abrupt budget cuts.

"Sequestration took a toll on the force by cutting into the readiness of all our troops," Hagel said. "But we were also mindful of the harmful impact on American industry, and the ripple effects it caused up and down the supply chain."

Despite a budget agreement last year that lessened the impact of spending cuts for fiscal years 2014 and 2015, sequestration will return in 2016 if Congress does not change the law, creating further uncertainty for DoD and industry,

Hagel said. "No organization, whether a government agency or a for-profit business, can plan for the future without being able to make some basic assumptions about resources," he added.

Challenges and threats to technological superiority stem from dwindling defense resources against the proliferation of sophisticated, deadly, and diverse national security threats, Hagel said. "As the United States emerges from more than 13 years of grinding warfare and large-scale counterinsurgency operations," he told the conference audience, "we're seeing first-hand that the rest of the world has not stood still."

Disruptive Technologies, Destructive Weapons

Hagel described disruptive technologies and destructive weapons once solely possessed by advanced nations that now are ubiquitous and are being sought or acquired by unsophisticated militaries and terrorist groups.

"Meanwhile, China and Russia have been trying to close the technology gap by pursuing and funding long-term, comprehensive military modernization programs," the secretary said. "They are also developing anti-ship, anti-air, counter-space, cyber, electronic warfare, and special operations capabilities that appear designed to counter traditional U.S. military advantages—in particular, our ability to project power to any region across the globe by surging aircraft, ships, troops, and supplies."

American dominance on the seas, in the skies, in space, and in cyberspace no longer can be taken for granted, the secretary said. "While the United States currently has a decisive military and technological edge over any potential adversary" he added, "our future superiority is not a given."

Hagel said a world without a decisive edge portends less stability and security for the United States and its allies.

"We must take this challenge seriously, and do everything necessary to sustain and renew our military superiority," Hagel said. "This will not only require active investment by both government and industry. It will require us to once again embrace a spirit of innovation and adaptability across our defense enterprise."

Prioritizing Key Investments

In the 2014 Quadrennial Defense Review and the president's fiscal 2015 budget request, Hagel explained, DoD prioritized key investments in submarines, cyber, next-generation fighter and bomber aircraft, missile defense, and special operations forces, putting a premium on rapidly deployable, self-sustaining platforms that can defeat more technologically advanced adversaries.

"To realistically sustain these critical investments while keeping our commitments to our people, we had to make tough but necessary choices, and tough but necessary trade-offs," Hagel said. "These included reducing the overall size of the force, divesting unneeded infrastructure, phasing out aging and less capable weapons platforms, and modestly adjusting military compensation."

Hagel lauded Deputy Defense Secretary Bob Work for his knowledge of strategies developed by 1950s and 1970s national security thinkers who ensured the military's superiority, including prioritized nuclear deterrence, and the long-range research, development, and planning program that shaped future investments in leap-ahead capabilities such as standoff precision strike, stealth, wide-area surveillance, and networked forces.

Frank Kendall, undersecretary of defense for acquisition, technology and logistics, is a key part of innovation programming endeavors that will span throughout the next several decades, Hagel said, but the Defense Department's role is only part of the effort required.

"We cannot assume—as we did in the 1950s and '70s—that the Department of Defense will be the sole source of key breakthrough technologies," Hagel said. "Today, a lot of groundbreaking technological change—in areas such as robotics, advanced computing, miniaturization, and 3D printing—comes from the commercial sector."

DoD must be able to assess which commercial innovations have military potential, the secretary said, must rapidly adopt them and adapt them, then test and refine them, including through war-gaming and demonstrations.

Meanwhile, he said, DoD's next round of improvements to the acquisition system will use stewardship initiatives to focus on the flow of technology to the warfighter.

Better Buying Power 3.0

The Better Buying Power 3.0 initiative, Hagel explained, will strengthen DoD's efforts to incentivize innovation in both industry and government while using more modular

and open systems architectures, will provide industry with draft requirements earlier, will remove obstacles to procuring commercial items, and will improve technology search and outreach in global markets.

"These initiatives and others will strengthen our defense industrial base and help both the U.S. and our allies and partners maintain our technological edge," Hagel said.

With 20 percent of DoD acquisition dollars devoted to small businesses, Hagel noted, niche areas within industry can be particularly vulnerable when production rates decline.

"Given today's budget environment, we need to maintain the skills, the talents, the knowledge, and expertise that vulnerable firms bring to the table," he said.

Caring for the Workforce

Acquisition improvements, Hagel said, are not restricted to how DoD buys weapon systems. Rather, he added, they also pertain to caring for the workforce.

DoD released a request for proposals to restructure and modernize its electronic health records system to meet present and future national health care data standards for quality and timely services to veterans and service members, the secretary noted. "It will allow DoD to do a much better job with sharing information with both the [Veterans Affairs Department] and private-sector health care providers."

While the breadth and magnitude of challenges are great, Hagel said, so is the DoD's capacity to meet them.

"History shows us that America has always risen to this challenge, no matter how daunting, thanks to the drive and entrepreneurial spirit that is the hallmark of America's national character," he said. "We will not fail this historic charge."

Official Describes Emerging Capability, Products, Processes

DEPARTMENT OF DEFENSE NEWS RELEASE (SEPT. 4, 2014)

Amaani Lyle

NEWPORT, R.I.—The United States affordably maintaining its technological advantage stems from exploiting untapped functionality in systems that it already has, a Pentagon official said during a panel discussion at the Defense Innovation Days conference here yesterday.

Earl Wyatt, deputy assistant secretary of defense for Emerging Capability and Prototyping, told defense industry leaders that advancing the "art of possibility" requires looking at innovation through two lenses—product perspective and

process perspective—to best facilitate getting capability and new functionality to the warfighter.

"We were able to maintain our technological advantage over the Soviets not because they didn't have the science, but because they didn't have the production capacity that we have in this nation—a tremendous ability to be able to produce things ... quickly with high quality," Wyatt said.

Products, he said, include microsattellites and other systems to create a communication and precision navigation environment without the added infrastructure that's often required.

Ideas from Industry

Wyatt also explained that data storage, cloud computing, and fuel cell battery technology are paying significant dividends, and he encouraged industry leaders to produce additional ideas, from an unconventional perspective if necessary.

In biomedical science, Wyatt said, the Defense Advanced Research Projects Agency is working to enhance the quality of life for wounded warriors, particularly amputees. "I'm extremely proud to see how [the amputees] are more than glad to walk around in shorts to let you see their prosthesis and how well they're able to get around effectively," he added.

While some technologies originated with the Defense Department, many have not, so the migration of those technologies from industry has been critical, Wyatt said. Shortening the design process in a time-sensitive or cost-effective fashion is best achieved by continuing industry partnerships, seeking new ideas, and modifying existing systems, he added.

Changing the Cost Calculus

Ultimately, Wyatt acknowledged, changing the cost calculus to equip warfighters more affordably is a challenge, but technology can mature through taking a different approach to problem solving.

"If we ask the question differently, we open up the opportunities for us to introduce something new, ... and it makes it so much easier to achieve the objectives in a cost-effective fashion," he said.

DoD Seeks Industry Collaboration in Technology Development

DEPARTMENT OF DEFENSE NEWS RELEASE (SEPT. 5, 2014)

Amaani Lyle

NEWPORT, R.I.—With potential adversaries spending significant amounts to nose ahead of U.S. technology invest-

ments, Defense Department industry partnership remains critical, the Pentagon's director of Unmanned Warfare and Intelligence, Surveillance and Reconnaissance said at the Southeastern New England Defense Industry Alliance's Defense Innovation Days conference here yesterday.

As the DoD fiscal year 2016 budget shapes up to be "less than planned for," Dyke D. Weatherington said, the United States faces the challenge of spending money on current assets while keeping future investments robust.

"The U.S. enjoyed a significant ... asymmetric capability over the last 10 years," he told the audience of defense industry leaders. "There are folks trying to find an asymmetric capability against us, and they're spending big bucks to get there, ... so our challenge is to stay ahead of them, and that is going to be tough in a fiscally tight environment."

While DoD historically tends to "hunker down and collapse back on core mission areas" to retain force structure, the need for innovation and creative ideas persists, he said. "This could be a great opportunity to force DoD to think outside the box, to move well beyond where we currently are today, but we can only do that with creative and innovative ideas," he added.

Weatherington noted recent ISR capability procurement, such as Pointers, Hunters, and Predators.

"All that capability has been procured, delivered, and used by the warfighter since 9/11," he said. "So I am absolutely convinced that industry can respond to DoD's need for innovation and excellent ideas that put DoD where we need to be."

The Defense Department will work to make the requirements, acquisition, and budget process better suited for innovation, Weatherington said, noting that Frank Kendall, undersecretary of defense for acquisition, technology and logistics, has worked hard to make the system more flexible by making "sorely needed" changes.

"At every turn," he added, "industry rose to the challenge and exceeded DoD's expectations when we asked for help, and in many cases, they actually knew better than DoD did what we needed."

By and large, Weatherington said, innovative companies putting their own ideas into programs and bringing those capabilities forward has helped to keep progress steady.

"DoD needs your help, and we need to partner with you at every level in that technology development process."

AFRL Commander Describes Air Force's Technology Vision

AIR FORCE NEWS SERVICE (SEPT. 16, 2014)

Staff Sgt. Devon Suits

WASHINGTON—The Air Force Research Laboratory commander discussed the future of hypersonic technology, directed energy, and autonomous systems at the 2014 Air Force Association's Air & Space and Technology Exposition here Sept. 16.

Maj. Gen. Tom Masiello reported that AFRL is working to weaponize hypersonic technology and make it available by the 2020-plus timeframe, which will provide a rapid strike capability and assist with more technical air strikes or possibly be used for intelligence, surveillance, and reconnaissance.

Study results collected by the AFRL have shown that hypersonic systems have the ability to fly at Mach 5 or 6, at very high-altitudes, and deploy a fast-response weapons system capable of flying over 500 nautical miles in less than 10 minutes.

This, he said, provides the warfighter with more energy on target while using a smaller warhead.

"What first put hypersonics on the map was our X-51 that flew in May of last year, and it was an aviation milestone," Masiello said. "It flew [under scramjet power] for more than 200 seconds when the previous record was just seven seconds."

Currently, in addition to hypersonic technology, AFRL is researching and developing two forms of directed energy systems, Masiello noted.

"[The high-energy laser program] has been over-promised, but under-delivered," he said, adding that he was on occasion leery of the program's progress.

According to Masiello, the solid state laser has emerged as a breakthrough program in recent years. "Now you can actually package it and fit it on an aircraft."

Currently, AFRL officials are researching lasers in the defense of aircraft with protection against missile threats and as a means of air and ground precision attack with low collateral damage.

"I can't over-emphasize the progress we have made in solid state lasers," Masiello said. "Initially, we are looking at more

self-defense. Eventually [we will] deploy against soft targets ... getting to hard target kills.”

High-powered microwave weapons technology also provides an alternative to kinetic weaponry by focusing on electronic target defeat, Masiello noted.

Masiello explained that during the testing phases, the AFRL set up two targets: an office building with computers and a hardened building that was a simulated chemical or biological facility.

The test facility deployed the Counter-electronics High-Powered Microwave Advance Missile Project, or CHAMP. Masiello showed test videos indicating that after the CHAMP passed the facilities, it was successful in deploying counter-electronic measures, shutting down the computers systems in both facilities.

“The capability is real ... and the technology can be available today,” he said.

AFRL officials are also focusing on the research and development of autonomous systems to assist with facilitating decisions at the speed of computing.

The ultimate goal, the general reported, is to create an effective human and machine team.

“We want machines to make decisions, we want the machine ... to be a teammate,” Masiello said. “We want the machine to do what it does best and take off the burden from the individual.”

Currently, AFRL is testing the use of air collision avoidance systems, which provides autonomous control of an aircraft in the event that the artificial intelligence senses a possible midair threat.

Additionally, AFRL is developing a work-centered processing, exploitation, and dissemination cell with the goal of providing an analytic system capable of integrating large amounts of data and alerting an analyst to possible threats, he said.

Night Turns into Day: Army Researchers Enable Night Lethality

U.S. ARMY COMMUNICATIONS-ELECTRONICS RESEARCH, DEVELOPMENT AND ENGINEERING CENTER, NIGHT VISION ELECTRONICS SENSORS DIRECTORATE PUBLIC AFFAIRS (SEPT. 16, 2014)

Kim Bell

FORT BELVOIR, Va.—In science fiction, technology problems are solved with the stroke of a writer’s pen. In reality, science and technology research takes time, and a lot of effort.

“If you’ve seen the movie Predator, you’ve seen a perfect illustration of the process of lethality,” said Dr. Don Reago, director of the Night Vision Electronics Sensors Directorate, or NVESD, of the U.S. Army Communications-Electronics Research, Development and Engineering Center at Fort Belvoir, Va. “First, you must identify your target and if in fact it is a target, then you can move in and eliminate the threat.”

In the movie, the predator identifies targets using thermal technology and deducing whether or not they are carrying weapons.

“If potential targets were unarmed, they went unharmed, much like how our warfighters operate at present,” Reago said. “Today, the Army’s goal is to improve situational awareness for soldiers, resulting in increased survivability, decreased civilian casualties, and accurate lethality when necessary.”

At NVESD, Army researchers are developing sensors, like the thermal sensors from Predator, as well as image intensification.

“With every advancement, we’re able to refine our work, build upon it, and make it better,” Reago said. “We use every opportunity we can to make our sensors smarter, lighter, and smaller.”

Sensors increase the odds of survivability by limiting unnecessary casualties and targeting threats. One such development is a consolidated control platform for multi-sensor systems. This fully integrated approach improves soldier efficiency and allows the user to accurately detect, locate, and then target threats.

The Multi-Function Video Display, or MVD, provides a touch screen interface for viewing and controlling all attached subsystems by combining all of the disparate control and display hardware into one universal interface.

“Having all sensor outputs controlled by one integrated system allows for improved target detection performance through the statistical combination of algorithmic processing results,” Reago said. “At NVESD, we’re able to understand the problem and create an effective, cogent, and straightforward solution to overcoming that problem.”

The Army’s premier scout sensor is the Long Range Advanced Scout Surveillance System, or LRAS3—also a science and technology effort from CERDEC NVESD. This long-wave infrared thermal imager, Day TV camera, and a differential GPS-based far-target location system gives soldiers the ability to detect and locate threats long before engaging targets with any direct action.

“By imaging scenes in the infrared, our warfighters are afforded additional capabilities to detect threats through smoke and fog with imagery stability over day, night, and temperature extremes,” Reago said. “After identifying the threats, soldiers have the capability to target these threats using CERDEC NVESD-developed micro-laser technology.”

Multiple athermal laser designs were developed over the last 10-12 years and have resulted in a significantly lighter weight and more compact man-portable laser designator/marker. Athermal means a process that does not involve either heat or a change in temperature. These NSVESD athermal laser designs are based on minimal electronics, Reago said.

The Army continues to look for advances in waveguide technology to provide advanced displays that improve ergonomics and soldier situational awareness. These new displays can provide soldiers with a wearable display, which is coupled with advanced algorithms and symbology to improve overall lethality.

“CERDEC NVESD is at the cutting edge of these types of displays for both soldier-borne and vehicle-based platforms, slowly giving our soldiers capabilities much like the predator from the future,” Reago said. “The work conducted at NVESD really matters to our soldiers; the technology helps accomplish the mission while saving lives.”

The Communications-Electronic Research, Development and Engineering Center is part of the U.S. Army Research, Development and Engineering Command, which has the mission to develop technology and engineering solutions for America’s Soldiers.

RDECOM is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army’s premier provider of materiel readiness—technology, acquisition support, mate-

riel development, logistics power projection, and sustainment—to the total force, across the spectrum of joint military operations. If a soldier shoots it, drives it, flies it, wears it, eats it, or communicates with it, AMC provides it.

Air Force Leadership Confident in KC-46 Program

AIR FORCE NEWS SERVICE (SEPT. 16, 2014)

Senior Airman Alexander W. Riedel

WASHINGTON—The Air Force program executive officer for tankers briefed Air Force and industry leaders on the KC-46A Pegasus’s production progress and acquisition timeline at the Air Force Association’s Air & Space Conference and Technology Exposition here Sept. 16.

After it received its official name “Pegasus” in February, the 6th generation tanker construction is progressing toward a flightline debut in 2015, Maj. Gen. John Thompson said.

“One of the hallmarks of this program was stable funding, and stable performance,” Thompson reported. “I can’t thank [Air Force and Defense Department leaders] enough, who have ensured funding stability is paramount.”

Based on the Boeing’s 767 design, four developmental KC-46As are beginning to take shape at their construction location in Washington, he said, and despite government shutdown and sequestration, funding requirements have been met.

As a result, the program office expects an initial expectation of 179 aircraft with delivery of the first 18 tankers by 2017, he said, with a production ramp-up of 15 aircraft per year to follow through 2027.

For five decades, the KC-135 Stratotanker has been the backbone of air refueling, Thompson noted. Originally acquired as an interim solution to an urgent need for increased global mobility, 4,000 of the original 700 produced KC-135s are still in service, but efforts to increase service life are making the airframe untenable from a cost and capability standpoint.

“In fact, we’re quickly approaching the timeframe where there will be no pilot, in the active duty, Guard or Reserve, who is older than the airplane he or she is flying,” he said. “That’s not bad for an interim tanker—while the Air Force develops a dedicated tanker to escort the bombers on their strategic missions.”

Likewise, with KC-10 Extenders’ service averaging over 28 years, the KC-46A is a long-anticipated first step in recapitalizing the aging tanker fleet, Thompson explained, adding the



The KC-46A is intended to replace the United States Air Force's aging fleet of KC-135 Stratotankers and provides vital air refueling capability for the United States Air Force.

Courtesy Photo

new aircraft will bolster U.S. global mobility as an improved operating platform for 2,800 total-force tanker pilots and 1,500 boom operators.

"Every day, those crews, along with the maintainers, push out an average of 150 sorties a day, with higher numbers during contingencies around the world," Thompson said. "We refuel, on average 450 receiver aircraft, of [joint], allied, and coalition partners around the world ... We need to give those crews, the boom operators and maintainers on the ground, a new capability."

Besides offering operators vastly increased fuel carrying capacity, flow rates, and boom and drogue refueling on the same sortie, Thompson said the new airframe boasts improved efficiency, increased cargo, and aeromedical evacuation capabilities.

"It's a multi-role capability [aircraft]," Thompson said. "Its primary mission is aerial refueling, but it's very, very capable [for a variety of missions]."

The tanker, he added, will also offer receiver air refueling, improved force protection, and an entire main deck floor that can be reconfigured for seated passengers or aeromedical evacuation needs.

To prevent design issues, Thompson said the program established five systems integration labs to conduct ground-based, risk-mitigation tests prior to flight testing.

"One of the tenets of this program was to have robust system integration labs on the ground to burn down risk before flight testing," Thompson said, adding that technical performance overall remains on track.

The wet fuels lab, for example, recently demonstrated the anticipated 400-gallon fuel flow rate, Thompson said. Another, the lighting and camera lab, tests the electronic refueling control system that will place the boom operator in front of a computer console near the flight deck instead of a window in the back of the aircraft.

"There are more lights on the underside of this tanker than there are antennae on this aircraft," he said. "Boeing established the lab to validate, prove, and demonstrate the capability for all-weather, daytime, nighttime, and covert refueling missions."

Thompson acknowledged the complexity of the Pegasus' advanced construction did pose a few production challenges this year when engineers found internal wiring for redundant aircraft systems were placed too close to one another, risking the loss of essential systems in an emergency.

“Wiring that represents redundancy cannot be placed next to each other in the same bundle,” he said. “Your back-up has to be in another physical location on the aircraft so that if one gets taken out, you don’t lose the capability.”

While a commercial version of a Boeing 767 aircraft contains about 70 miles of wiring, Thompson said the military KC-46 version will require about 120 miles. Because of this, the relocation and installation of new bundles impacted the assembly and testing timeline, resulting in “slower than planned” delivery.

“This is not a big performance issue, it’s a compliance issue and something we’d rather catch early than later, while it only requires a minor redesign,” he said. “But ... we’re eager to get into flight testing and unfortunately this production challenge [has taken some] of our schedule margin, so schedule performance has to improve.”

Once the assembly returns to schedule, officials will return to a “test once” strategy intended to better leverage a single test event to accomplish multiple certifications before flight.

“We’re still a top-three modernization program, and requirements and funding stability have been great so far,” Thompson said. “We have a great plan for training and we’re confident we’re overcoming a recent spate of production issues. We’re really eager to get this aircraft.”

Air Mobility Command Outlines Future ‘Total Force’ Mobility Requirements

AIR FORCE PUBLIC AFFAIRS AGENCY (SEPT. 17, 2014)
Air Force Staff Sgt. Carlin Leslie

WASHINGTON—The Air Mobility Command director of strategic plans, requirements and programs discussed innovation and technology that will shape the total force mobility enterprise in the coming years during an Air Mobility Command requirements brief at the 2014 Air Force Association Air & Space Conference and Technology Exposition, Washington, D.C., Sept. 16.

While talking about how AMC enables and has vested interest in all five Air Force core missions, Maj. Gen. Michael S. Stough highlighted the main focus area for mobility airmen—rapid global mobility. Stough said AMC is working together with Guard and Reserve mobility airmen to better shape the future of the fleet that is the backbone of this capability.

“We are shooting to be a sufficient total force,” he said. “Sufficient to execute the missions to which we are assigned, and a total force because we can’t do it without our Guard and Reserve partners,” he said.

Stough’s brief touched on near-term requirements, but also what the command is thinking about as far as determining future capabilities, and looking beyond the platform itself.

“In some cases, it’s not the platform, it’s about what’s on the platform—for example, sensors or some other component,” Stough said. “The key is, we need to look at what are those capabilities we need to develop in the future.”

As the general talked about future capabilities, one possibility he talked about was additional autonomy on the next-generation KC-Y or KC-Z. Stough said that concept doesn’t necessarily mean fully autonomous or unmanned as the next step. He said it could include looking at how future generations of tankers can add autonomy in ways that allow for potentially decreasing the number of crew members on an aircraft, or keeping the same number but increasing the safety, assistance, and decision-making ability the crewmembers have.

“We think there’s great promise in autonomy,” he said.

“On the fleet as a whole, we’re working very hard to ensure those airplanes we have now will continue to be capable into the future,” said Stough. “But at the same time, we have to start looking ahead at where we need to go from here.”

Chemical-Biological Researchers Deliver Results

U.S. ARMY EDGEWOOD CHEMICAL BIOLOGICAL CENTER PUBLIC AFFAIRS (SEPT. 18, 2014)

ABERDEEN PROVING GROUND, Md.—Choking, watering eyes, blistering skin, and convulsions are symptoms of imminent death from a chemical weapons attack. The lethality of such attacks, most recently in August 2013 in Syria, sends tremors across the globe.

For soldiers, chemical weapons present a real danger on the battlefield that requires advanced technology to keep them safe. The Army is investing in science and technology to enable soldiers to operate in a chemical-biological threat environment.

Scientists and researchers at the U.S. Army Edgewood Chemical Biological Center work to provide better protective equipment, such as the iconic protective mask. As threats evolve, ECBC engineers fielded the next-generation M50 mask to soldiers stationed in Japan and Korea. The Army is fielding more than one million of these masks across the Department of Defense.

“I noticed the difference between the M50 and the old M40 mask as soon as I put it on,” said Sgt. James Tuthill, a training

non-commissioned officer stationed at the Marine Corps Air Station Cherry Point, N.C. "I train Marines to be prepared for chemical, biological, and radiological hot zones, and this mask provides them with better visibility, easier breathing, and greater comfort wearing it. On top of all that, it just looks cool."

Looking cool may give the mask some style points, but its improved functionality is what enables soldiers to keep calm under pressure and execute their missions. Instead of goggles and just one filter traditionally found on its predecessor, the M40 mask, the M50 mask has a wrap-around visor and symmetrical filters on each side. It also has a silicon and butyl face piece that is flexible enough to fit all face sizes from the second to the 98th percentile of the adult population. These design enhancements make breathing 50 percent easier than the legacy M40 mask. It costs \$280 to manufacture the M50 mask, its filters, a mask carrier, and a decontamination kit.

The new mask is 15 years in the making. ECBC's Joint Service General Masks Team, or JS GM, spent more than a decade developing an advanced, ergonomic and effective respiratory protective mask that can be used across the U.S. military for the defense of chemical agent threats. Soldiers can change filters in a threat environment, and the single lens across the face allows for a wider area of view for binocular use or other sighting devices. With increased comfort, improved visibility, and better hydration, the new mask is considered one of the most heavily tested pieces of personal protective equipment developed by the DoD.

"We have been involved with every step of the design, validation, and testing and modification process. [We were also involved in] filter testing and product quality and deficiency reporting," said Akanksha Raja, ECBC systems and logistics engineer.

The JS GM team traveled to Japan and Korea March 12 on a seven-week campaign to field masks at six Army sites. By the end of April, more than 39,000 masks had been successfully inspected and fielded to soldiers in the region. The mask had been outfitted across the Services since 2008, beginning with the Air Force, which has already received 345,448. The Navy received 274,333 masks, and the Marine Corps received 131,289. By 2019, the Army expects to field nearly 1.25 million masks.

A typical fielding includes the team arriving onsite, where an inspection is conducted for random sampling of five percent of the inventory to ensure quality of the shipment. Masks are then staged by commands in advance of the training

sessions, during which 20 to 25 CBRNE specialists spend four hours training soldiers using a train-the-trainer style that includes instruction on how to properly use and store the mask.

"We also authored the technical manual, and after the training, we remain a touch point for the soldiers to answer any questions they have about the training, usage, or storage of the mask," Raja said.

Even as the M50 is fielded, ECBC continues to improve the most important piece of protective gear the U.S. Army has ever issued, Raja said.

The Army is currently designing a next-generation respirator that is lighter, smaller, and has a built-in air flow from the nose cup to the eye cavity to keep the face cooler. Physiological monitors and sensors will control fan speeds for the air based on the breathing demands of the user. The most advanced communications technology will also be integrated into the mask.

"The center's history of chemical weapon defense and soldier protection keeps the end user in mind," Raja said.

The Edgewood Chemical Biological Center is part of the U.S. Army Research, Development and Engineering Command, which has the mission to develop technology and engineering solutions for America's soldiers.

RDECOM is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army's premier provider of materiel readiness—technology, acquisition support, materiel development, logistics power projection and sustainment—to the total force, across the spectrum of joint military operations. If a soldier shoots it, drives it, flies it, wears it, eats it, or communicates with it, AMC provides it.

Acquisition Strategy to Improve Stakeholder Relationships, Transparency

AIR FORCE NEWS SERVICE (SEPT. 19, 2014)

Senior Airman Alexander W. Riedel

WASHINGTON—The assistant secretary of the Air Force for Acquisition outlined the Air Force procurement priorities at the 2014 Air Force Association's Air & Space Conference and Technology Exhibition here Sept. 16.

In his first address to AFA as assistant secretary, Dr. William A. LaPlante said his aim is to improve upon the Services' track record by building stakeholder relationships and transparency.



Dr. William LaPlante talks to attendees about Air Force acquisition during the 2014 Air Force Association's Air & Space Conference and Technology Exposition Sept. 16, 2014, in Washington D.C. LaPlante is the assistant secretary of Air Force Acquisition. He directs more than \$35 billion annual investments that include major programs like the KC-46 Pegasus, F-22 Raptor, F-35 Lightning II, C-17 Globemaster, Space acquisition, munitions, as well as capability areas such as information technology and command, control, communications, computers, intelligence, surveillance, and reconnaissance, or C4ISR systems.

U.S. Air Force photo/Staff Sgt. Anthony Nelson Jr.

"The strategy of Air Force acquisition is really the 'what' we want to do ... We want to have a good, effective acquisition process that delivers to the warfighter capabilities that will be with them for years to come and are sustainable and economical," he said.

While previously dramatically understaffed before his arrival to the Pentagon, the secretary said his office is now beginning to reshape its outlook for the future.

"We're at full strength for the first time in more than five years," LaPlante said. "We're now tackling not just the execution, but tackling strategy and moving together to where we need to go with Air Force acquisition."

Part of the initiated changes, LaPlante said, is a reshaping of acquisition along with the five-center construct restructuring at Air Force Materiel Command.

"One of the benefits of the construct from an acquisition perspective is that the program executive officers, or PEOs, own the life-cycle sustainment for systems. That's a very important thing and a difference in culture and outlook," he said. "When you have to live with what you're building and

with the legacy systems that you're replacing, it gives you a totally different view on acquisition."

Bringing in sustainment and life-cycle support to the acquisition thinking, LaPlante said there will be a common approach to find the most cost-effective program—not just in the near term but during a program's life cycle.

"I think what you're seeing is a strategic shift, where the Air Force is leading ahead of the other Services in having both our PEOs and our headquarters mindful of sustainment," he added. "In regards to depot management, the Air Force is considered to be the best among the Services, and we want to build upon that success."

LaPlante said going forward, Air Force acquisition will need to follow principles of strategic agility and adaptability and described the five acquisition priorities: getting high priority programs right and keeping them on track; ensuring transparency; owning the technical baseline for important programs; building on "better buying power" to achieve best outcomes; and finally, building a long-term strategy that includes strategic agility.

Listing current progress on top priority acquisition programs, F-35 Lightning II, the KC-46A Pegasus, and long-range strike bomber, LaPlante said these programs are largely on track without major changes.

The secretary said while an acquisition program is often at the center of scrutiny when there are challenges—such as the recent engine fire of the F-35 and others—there are many preconceived misperceptions. Acquisition processes are often complex, and explaining them in a way that is clear and concise is a challenge.

“When you look at [Air Force] acquisition, there are a lot of good things going on,” LaPlante said. “We just have to tell those stories.”

Part of better telling the acquisition story, he said, is transparency about progress on innovation and modernization programs.

“Development programs take too long,” he added. “The average planning is for a five-year program and we end up executing, on average, a seven-year plan. That’s true for the other Services as well—and that’s not good.”

LaPlante further stressed the importance of reducing costs through increased efficiency and effectiveness by reducing time-to-contract award without compromising cost negotiations.

Another part of transparency is working with industry partners in actively developing Air Force programs by connecting warfighter needs with industry expertise.

“We want to bring industry in before we have the requirements figured out,” he said. “How can we ask industry to help us innovate if they are not in at the front end when we’re working on these concepts?”

Other factors to control cost include empowered, strong program offices that own the technical baseline and data on their programs.

LaPlante also called for adaptability and said that in a changing world, Air Force acquisition needs to be able to adjust to changing requirements.

“Increasing the agility and effectiveness within our acquisition workforce will set us on the right path to meet the dynamic needs of our warfighters,” LaPlante added. “It’s a great time to be in Air Force acquisition.”

Modernization of U.S. Nuclear Forces Not Optional

AIR FORCE GLOBAL STRIKE COMMAND PUBLIC AFFAIRS (SEPT. 19, 2014)

Airman 1st Class Joseph Raatz

WASHINGTON—The need for modernization of the U.S. nuclear forces was made clear by speakers at a strategic nuclear enterprise symposium here, Sept. 18.

“We’re here to share thoughts about the current state of, and the way forward for the nuclear strategic deterrent enterprise,” said Mark Jantzer, the Task Force 21 chairman.

Much of the discussion during the symposium was centered on the need for modernization of U.S. nuclear forces.

The annual symposium, sponsored by the Minot Chamber of Commerce’s Task Force 21, brings defense officials, government executives, and civic leaders together to discuss strategic force structure and modernization.

“You don’t want them to have to be the person to walk into the Oval Office in 2025 or 2028 or 2030 and say ‘Mr. or Madam President, I’m so sorry but we just aren’t able to neutralize that threat to America,’” said Maj. Gen. Garrett Harencak, the Strategic Deterrence and Nuclear Integration assistant chief of staff. “We have to convince the American people, folks in our government and folks in our own military, of the incredible relevancy of a nuclear deterrent today and in the future.”

One such modernization program spoken about at length during the symposium was the upcoming long range strike bomber.

“As we look forward, I think that our modernization programs are absolutely essential,” said Lt. Gen. Stephen Wilson, the commander of Air Force Global Strike Command. “I’m paraphrasing the [chief of staff of the Air Force], but it’s time for us to become the nuclear force that our nation needs us to be, not the nuclear force we used to be.”

The LRS-B is one of the Air Force’s top acquisition priorities, Wilson explained. Of the current U.S. nuclear-capable bombers, the last B-52 Stratofortress came off the line in 1962 and the B-2 Spirit just turned 25. If The U.S. is to be able to continue holding any target at risk, anywhere in the world, it’s going to need a bomber capable of penetrating whatever advanced air defense systems America’s adversaries can come up with in the foreseeable future.

Other current modernization efforts discussed included the long range standoff-missile as well as upgrades for the Min-

uteman III intercontinental ballistic missile, and its eventual replacement program, the Ground-Based Strategic Deterrent.

"[The GBSD] is a key program as we move forward," Wilson said. "The Minuteman III was designed in the 1960s, and it's been on alert since 1973. We have to replace that missile."

A replacement for the current Ohio-class ballistic missile submarine was also discussed.

Unlike the U.S., both Russia and China are currently testing new models of ballistic missile submarines, according to Rear Adm. Joseph Tofalo, the director of the Navy's Undersea Warfare Division.

The Ohio-class was originally designed with a service life of 30 years, but due to budget constraints the retirement of the class has been delayed until 2031—20 years past its original expected retirement.

"For the foreseeable future, certainly for our and our children's and our grandchildren's lifetimes, the United States will require a safe, secure, and effective strategic nuclear deterrent," Tofalo said. "The ballistic nuclear submarine forces are and will continue to be a critical part of that deterrent. Each of the legs of the triad brings unique strengths that pro-

vide a strong deterrent against different classes of adversary threat, and each of the legs reinforces the effectiveness of the others."

Adm. Cecil Haney, the commander of U.S. Strategic Command, discussed components beyond the triad that support the nuclear enterprise.

"Strategic deterrence is more than just the triad of platforms," Haney said. "It includes robust and agile intelligence capabilities; dedicated space and ground sensors that provide critical early warning; and assured national nuclear command, control, and communications to move that information. [Deterrence] also includes sustaining the necessary infrastructure to support our nuclear roles, missions, and weapons; maintaining missile defenses to defend against attacks; and providing relevant space and cyberspace capabilities.

"All these areas are interrelated and we must leverage our capabilities and assess today's threats in an integrated manner to ensure strategic stability," the admiral continued. "In a world where our traditional adversaries are modernizing, emerging adversaries are maturing and non-state actors remain elusive and dangerous, we must get 21st century deterrence right... the reality is that an effective, modernized nuclear deterrent force is needed now more than ever."