

## **DARPA Uses Open Systems to Boost Airpower**

DOD NEWS, DEFENSE MEDIA ACTIVITY (MARCH 31, 2015)

Cheryl Pellerin

WASHINGTON—The Defense Advanced Research Projects Agency (DARPA) is unveiling a new program to boost U.S. air superiority by separating payloads such as weapons and sensors from the main air platform, and using open-system architectures to seamlessly integrate plug-and-fly modules into any kind of platform.

The program, called System of Systems Integration Technology and Experimentation (SoSITE) aims to develop and demonstrate concepts for flying combinations of aircraft, weapons, sensors, and mission systems that distribute air-warfare capabilities across interoperable manned and unmanned platforms.

The DARPA vision is to integrate new technologies and airborne systems with existing systems faster and at a lower cost than advanced adversaries can counter them, said Dr. Nils Sandell Jr., the director of DARPA's Strategic Technology Office.

"We feel that the [Defense] Department is facing some significant technical challenges," he said.

### **Threatened Technological Lead**

"I talk to my friends and neighbors, and they take it for granted that [the United States] has air superiority and that we can impose our ability to project power anywhere we want to," he said, adding that high-end potential adversaries have been systematically developing their own equipment and systems.

"Our technological lead is definitely threatened," Sandell said. "The threats are not only external, but also self-inflicted by the extreme degree of complexity being crammed onto massive military platforms.

"Our systems are becoming so complex, so time consuming to produce, that we can't keep pace with commercial technology and we can't keep pace with the threat," the director said.

Because fielding or upgrading advanced airborne systems can take decades and cost billions of dollars, he added, it has not been possible to modernize subsystems in the complex platforms apace with rapid advances in commercial technology.

### **System of Systems**

"A system-of-systems approach could help overcome [the] inherent issue with high-cost, monolithic, multifunction platforms," Sandell said.

Distributed air warfare platforms have other advantages, he added. "What we would like to enable is a future scenario in which a smaller number of manned aircraft would combine with unmanned aircraft to do [a] total job," the director said. "They would be networked together ... and the unmanned aircraft could venture into the more dangerous territory, providing some degree of risk avoidance for the pilots."

The unmanned platforms would be simpler and could do individual jobs like carry weapons, electronic warfare systems, or sensors—the last allowing the manned aircraft to be silent and harder to detect, he said.

### **Distributed Air Warfare**

"The fundamental idea is to take platforms that today are manned, monolithic and expensive, and distribute the capability over a much more heterogeneous set of platforms to perform similar functions," Sandell said.

In such a configuration, the pilot becomes a battle manager, deciding what the small aircraft should be doing and how to orchestrate it. DARPA has a suite of programs whose automation is designed to help pilots with the task.

"We've recently come out with [a program] called Distributed Battle Management, and that's exactly to provide the automation and decision aids to enable a pilot to be able to fly his jet and do these future tasks," Sandell said.

It's also important that the pilot is the decision maker, he added.

### **Communications in Contested Environments**

"We're not talking about a totally robot army or something like that," Sandell said. "The pilot has to be able to exert control [and] to be in communication with these platforms, so we have a communications program called Communications in Contested Environments that's working the issue of getting these platforms to talk to one another."

DARPA's vision is that the combination of robust communications and automation will be sufficient to allow the pilot to do those tasks, he added.

Sandell wants to be clear that DARPA is not trying to replace air platforms like the F-35A Lightning II or the F-22 Raptor, but rather to augment their capabilities.

"[The monolithic platforms] are going to be expensive," he said. "We probably won't be able to buy as many of them as we would like to if history plays out, so we want to be sure that the Services, who ultimately make decisions about what to buy, [have] an enriched set of options as they go forward."

### Open-Architecture Approaches

For the SoSITE program, a second focus involves DARPA and the Services' engagement in open-architecture efforts to allow platforms to be upgraded with equipment that seamlessly plugs and plays.

Sandell said the legacy approach, which often involves a yearlong process to agree on standard interface, can limit the ability to integrate new technology that doesn't fit within that interface. By contrast, open-architecture tools more easily allow the integration of new technology when it comes along.

The Air Force has an effort called Open Mission Systems, and DARPA is collaborating closely with them, Sandell said. The Navy has an open-architecture effort called Future Avionics Capability Environment that DARPA works with, and it has recently shown impressive accomplishments.

### SoSITE Program Phases

The SoSITE program has two phases, and it is now in the two-year-long first phase, which has two technical areas.

TA1 is architecture analysis, and TA2 is integration technology. The program is less than a quarter of the way through the first phase. In the second phase, the plan is for the two Phase 1 technical areas to come together for the program's experimentation portion.

According to DARPA, the agency has awarded contracts to develop concepts for system-of-systems architectures and tools for rapid integration and testing.

Under those contracts, Boeing, General Dynamics, Lockheed Martin, and Northrop Grumman are developing and analyzing promising architectures and designing plans for flight experimentation with the architectures.

Apogee Systems, BAE Systems, and Rockwell Collins are developing tools and technologies to enhance open-system architecture approaches.

### Robustness Against Cyberattack

One of the limitations of open architecture is that it provides what Sandell said is known as "an increased attack surface" for cyberattacks.

"What we're doing on our program, in our development of system-of-systems integration technology, is building robustness against cyberattack into the design process, as opposed to putting it in as an afterthought," the director said.

This involves things like building software into the system that is located in random places in memory so an attacker won't know where to go to find it. "There are techniques of that type we're building into the process," Sandell said.

Of the three contractors who are developing techniques to better integrate system of systems, at least two of them are addressing the cyber problem and coming up with all sorts of techniques, he said.

### Looking to the Future

"They draw on our [Information Innovation Office] folks here at DARPA—the primary folks who do cyber—so we're not doing research on cyber so much as making sure the state of the art in cyber protection is built into the system of systems design process," he added.

Looking to the future, Sandell said that monolithic, but sophisticated platforms like the F-35 probably will continue to have very high value.

"I think they will be part of a family of systems or of a system of systems and not single silver-bullet solutions by themselves," he said. "In particular, we think that any of the future platforms would be designed in much more of an open-architecture fashion, so although the platform may last for a long time and take a while to develop, the electronics in it can be upgraded much more rapidly."

Sandell believes, in a sense, "the F-35 is the last of a kind. I don't think we'll develop anything that tightly integrated in the future."

### Scientists Take a Deep Dive for Undersea Warriors

OFFICE OF NAVAL RESEARCH CORPORATE COMMUNICATIONS

(APRIL 3, 2015)

David Smalley

ARLINGTON, Va.—Office of Naval Research (ONR) officials announced April 3 new research support to develop a prototype diving helmet that could revolutionize diving missions and provide greater safety for divers.

The announcement from ONR's TechSolutions program supports ongoing work to improve a diver's "rebreather" helmet system—a crucial piece of equipment that conserves breathing gas and combats the toxic gases that impact divers' breathing beneath the waves.

“Our undersea warriors deal with challenges that most of us will never have to face here on the surface,” said ONR Executive Director Dr. Walter Jones. “We’re working hard to get them the most cutting-edge technologies to accomplish their wide array of missions, and get them back to their ships safely.”

The rebreather and helmet research is taking place at Naval Surface Warfare Center Panama City Division. The program developed a prototype life-support diving system that was announced last month.

The new research phase will lead to advanced testing to produce enhanced dive-ready prototypes, officials say.

The benefits to divers could be enormous. All divers encounter dangerous levels of toxic nitrogen and carbon dioxide gases when breathing underwater, requiring a rebreather system to mitigate the toxicity. Navy divers use a breathing system called the Fly-Away Mixed Gas System, in which helium replaces the nitrogen that can lead to crippling, even fatal decompression sickness, known informally as “the bends.”

While effective, it requires and expends large amounts of oxygen and helium in complicated mixtures.

However, helium availability has diminished in recent years, as demand has grown and production has slowed, and it has become more expensive and difficult to find. The new “hybrid” rebreather helmet from ONR TechSolutions allows divers to alternate between different breathing systems, and reduces the amount of helium needed.

This will allow Navy divers more diving opportunities than short supplies of helium currently permit.

Smaller vessels for missions will become a new possibility as well, since less gas will be needed for the divers—and hence less storage space required for gas canisters.

Finally, by optimizing the gas mixtures, the new rebreather will also extend the time divers can remain underwater safely in the event that primary breathing gas is interrupted.

“We’re excited about the opportunity to make a positive impact on the mission capabilities of Navy divers,” said ONR Command Master Chief Jesse Thomas. “Master divers have consistently said that one of their greatest needs is to have more options in the breathing apparatus, and to extend the window of safe diving time.”



PANAMA CITY, Fla. (March 19, 2015). A prototype for a new life support system for divers is displayed on a mannequin at the Naval Surface Warfare Center in Panama City, Fla. The semi-closed system has been developed to accelerate Navy diver deployment, increase safety, and conserve the mixed gas atmosphere.

U.S. Navy photo by Anthony Powers

The work of the Navy diving community includes missions from underwater rescues to covert operations, and from explosive ordnance disposal to hull maintenance.

Undersea medicine—which includes the development of science and technology (S&T) aimed at optimizing submariner and diver performance—is designated an official national naval responsibility.

The rebreather work aligns with the recently released Naval S&T Strategy, which emphasizes national naval responsibilities as a key component of warfighter performance.

ONR's TechSolutions program takes technology requests directly from sailors and Marines. When the organization receives a request for a technology solution to a problem—anything from sailors on watch needing improvements in steel toe boots, to Marines in theater requesting better mortar sights—the program attempts to find and deliver a rapid prototype solution, usually within 12-18 months from the request being received.

ONR provides the science and technology necessary to maintain the Navy and Marine Corps' technological advantage. Through its affiliates, ONR is a leader in science and technology with engagement in 50 states, 55 countries, 634 institutions of higher learning and non-profit institutions, and over 960 industry partners. ONR through its commands including headquarters, ONR Global, and the Naval Research Lab in Washington, D.C., employs more than 3,800 people, comprising uniformed, civilian, and contract personnel.

For more news from Office of Naval Research, visit <http://www.navy.mil/local/onr/>.

### **Combat Support Agency Counters Worldwide IED Threats**

*DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 6, 2015)*

*Terri Moon Cronk*

WASHINGTON—The organization that has fought for a decade to defeat improvised explosive devices used by American enemies in the Iraq and Afghanistan wars has become a combat support agency, its director said in a recent interview.

The Joint Improvised Explosive Device Defeat Organization—known as JIEDDO—was realigned under the defense undersecretary for acquisition, technology and logistics March 11 and is “here to stay,” Army Lt. Gen. John D. Johnson told DoD News.

Johnson said he wants to ensure every commander and warfighter is aware of the agency's capabilities to support those in the field.

Johnson added that DoD's senior leadership recognized that the global threat of IEDs is not going away, and that the agency's new status means the capabilities it provides will be around a long time.

As a Defense Department function, the general said, the agency has better access to other DoD capabilities to “collaborate and to make sure we're providing even better support to deployed service members.”

### **JIEDDO Established During Wars**

Johnson said the need for JIEDDO became great when IEDs were killing and injuring large numbers of service members, and JIEDDO stood up as a joint organization from an Army task force in 2006 at the height of the Iraq and Afghanistan wars. The military realized it needed an organization to work across the entire spectrum of the problem by analyzing IED threats and developing training and new equipment for warfighters, he added.

Today, “we track IEDs around the world, and in [the] past 12 months, over 26,000 IED events caused 55,000 casualties,” the JIEDDO director pointed out.

“Gratefully, very few were Americans,” he added, “but it means that anywhere U.S. troops deploy, they are going to be at risk of IEDs.”

JIEDDO works to connect a variety of IED experts early within deploying units' training cycles, Johnson said, so warfighters are knowledgeable of terrorist networks and the types of battlefield support the combat support agency will provide them.

### **Embedding Experts with Troops**

JIEDDO experts range from intelligence analysts, operational experts, and combat advisers that offer training and adaptable solutions to warfighters and forces building allies' capacities to improve counter-IED efforts, Johnson said.

These experts embed with U.S. forces from the start of deployment, regardless of assignment, from maritime crisis response forces, the Army's regionally aligned forces or special operations, the general said. Embedding experts helps troops and commanders understand what they're seeing and how best to use the resources at their disposal to deal with threats, protect forces, and defeat the enemy, he said.

### **JIEDDO a 'Game Changer' After Wars**

JIEDDO brought a game changer to the table after its work during the Iraq and Afghanistan wars, in which it provided a warfighter package of urgently needed training, analytical support, and equipment to counter IED threats, the general said. Today, those capabilities reach across the globe, he added. “We can apply the analysis to new training techniques, new tactics, equipment, and significantly enhance how our ground forces do business,” he said. “We help warfighters adapt.”

A key issue of IED proliferation by a variety of terrorist networks is that these homemade bombs use products such as fertilizer and cheap, commercial-grade explosives used in

farming and mining, so the materials are available just about anywhere, Johnson pointed out.

Compounding the expanding IED global presence is that terrorist networks share information, he said. "The enemies are very innovative, and they share their ideas and innovations. If we see IEDs that have success in one place, we can guarantee you we're likely to see it elsewhere," Johnson said.

And it's that very type of information JIEDDO shares with forces deployed around the world so warfighters are better prepared and equipped to handle the problem, in addition to having reachback to national-level resources, the director explained.

### 'Global IED Threats to Continue'

There was some thought that JIEDDO might cease to exist following the end of the two wars, Johnson said, but that is not the case.

"The truth is, we're going to face IEDs anywhere we go in the world," he emphasized. "IEDs have proliferated around the world, and they challenge security forces across the globe. Now we're back helping the Iraqis with the problems there, and our enemies are using IEDs in greater numbers all the time."

Because of that global threat, JIEDDO's business model is well entrenched for efforts in the Middle East, but also counters the IED threat in various other regions of the world such as Africa, South America, the Far East, and the Pacific region, Johnson said.

JIEDDO's mission is far-reaching, but has a central goal, he said. "We provide counter-IED capabilities that allow [service members] to adapt and be that No. 1 weapon on the battlefield," said Johnson, who described service members as "the most trained, most capable weapon."

### LOCUST: Autonomous, Swarming UAVs Fly into the Future

OFFICE OF NAVAL RESEARCH COMMUNICATIONS (APRIL 14, 2015)

David Smalley

NATIONAL HARBOR, Md.—A new era in autonomy and unmanned systems for naval operations is on the horizon, as officials at the Office of Naval Research (ONR) announced April 14 recent technology demonstrations of swarming unmanned aerial vehicles (UAVs)—part of the Low-Cost UAV Swarming Technology (LOCUST) program.

LOCUST can launch swarming UAVs to autonomously overwhelm an adversary. The deployment of UAV swarms will provide sailors and Marines a decisive tactical advantage.

"The recent demonstrations are an important step on the way to the 2016 ship-based demonstration of 30 rapidly launched autonomous, swarming UAVs," said ONR Program Manager Lee Mastroianni.

The LOCUST program includes a tube-based launcher that can send UAVs into the air in rapid succession. The breakthrough technology then utilizes information-sharing between the UAVs, enabling autonomous collaborative behavior in either defensive or offensive missions.

Since the launcher and the UAVs themselves have a small footprint, the technology enables swarms of compact UAVs to take off from ships, tactical vehicles, aircraft or other unmanned platforms.

The ONR demonstrations, which took place over the last month in multiple locations, included the launch of Coyote UAVs capable of carrying varying payloads for different missions. Another technology demonstration of nine UAVs accomplished completely autonomous UAV synchronization and formation flight.

ONR officials note that while the LOCUST autonomy is cutting edge compared to remote-controlled UAVs, there will always be a human monitoring the mission, able to step in and take control as desired.

"This level of autonomous swarming flight has never been done before," said Mastroianni. "UAVs that are expendable and reconfigurable will free manned aircraft and traditional weapon systems to do more, and essentially multiply combat power at decreased risk to the warfighter."

UAVs reduce hazards and free personnel to perform more complex tasks, as well as requiring fewer people to do multiple missions.

Lowering costs is a major benefit of UAVs as well. Even hundreds of small autonomous UAVs cost less than a single tactical aircraft—and, officials note, having this capability will force adversaries to focus on UAV swarm response.

Chief of Naval Operations Adm. Jonathan Greenert's Sailing Directions to the fleet note that over the next 10 to 15 years, the Navy will evolve and remain the preeminent maritime force. It directs: "Unmanned systems in the air and water

will employ greater autonomy and be fully integrated with their manned counterparts.”

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For more news from Office of Naval Research, visit <http://www.navy.mil/local/onr/>.

### Army Looks Toward Fully Autonomous Tactical Vehicle

ARMY NEWS SERVICE (APRIL 13, 2015)

Lisa Ferdinando

ARLINGTON, Va.—The Army is working toward developing a fully autonomous tactical vehicle, a robotics expert said. “When you start looking at the mid-term, five to 10 years, we start talking about tapping into external systems,” said Mark Mazzara, robotics interoperability lead for the Army’s Program Executive Office–Combat Support and Combat Service Support at Detroit Arsenal, Michigan.

Mazzara was a panelist, April 8, at the National Defense Industrial Association Ground Robotics Capabilities Conference and Exhibition in Crystal City, Va, where he discussed the path toward autonomous capabilities.

Autonomous vehicles will be able to operate without direct human supervision and are a step up from unmanned vehicles, which are typically controlled remotely. Today, unmanned aerial systems, for instance, have remote operators. In contrast, autonomous vehicles would be operated robotically.

The process to reach the goal of autonomous capabilities is a three-phased approach, Mazzara said, starting with driver-safety and driver-assist technologies that are upgrades to vehicles.

Mazzara explained that is followed by basic autonomy capabilities, which then lay the foundation for the third phase—a fully autonomous tactical vehicle.

The Army wants its Unmanned Ground Vehicle Interoperability Profile, or IOP, to enable this “evolutionary approach toward tactical vehicle autonomy,” he said.



A convoy of driverless U.S. Army trucks.  
DoD photo

"In the far term, we start talking about more ubiquitous interoperability between the robots and external systems," Mazzara said.

Today, semi-autonomous systems are used to clear mines, provide surveillance, convoy supplies, and acquire targets, among many other things.

To reach autonomous capability, the Army needs incremental hardware and software enhancements to existing systems/chassis; sensor and payload upgrades; modularity; open architecture in IOP or in- and out-processing software; standardization; miniaturization and light weight; and intelligent behavior.

One conference attendee said the problems of developing a fully autonomous vehicle were complex and it might take 30 years. Another conference panelist predicted that in possibly 10 years, the Army might have a rudimentary system that could recognize markings or patterns, especially in open terrain, to operate autonomously.

To reach that point, Mazzara recommended coordination with stakeholders, keeping industry informed, and stressing the value of IOP development. The profile would benefit everyone in the defense community, he said.

### **Better Buying Power 3.0 Stresses Innovation, Affordability**

*DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 15, 2015)*

*Amaani Lyle*

WASHINGTON—The latest update of the Defense Department's acquisition efficiency initiative stresses innovation and cost-consciousness, the Pentagon's top acquisition official said here yesterday.

Frank Kendall, undersecretary of defense for acquisition, technology and logistics, described Better Buying Power 3.0 during the Navy League's Sea-Air-Space Exposition.

Noting the April 9 release of the initiative's implementation directive, Kendall said the Department will continue its emphasis on affordable programs, but will enhance that focus by predetermining production costs and the feasibility of seeing new weapons and systems to completion.

### **Dominant Capabilities, Controlling Life-cycle Costs**

The other main mandate in Better Buying Power 3.0 is to achieve dominant capabilities while controlling life-cycle costs, Kendall noted.

"'Should-cost' is the idea that our managers are responsible for cost," he said. "They would then identify opportunities for savings and improve our buying power for value-added military capability."

Kendall also cited the need for greater agility and responsiveness as threats change, which he said translates into creating a tighter relationship with the intelligence community and a focus on cybersecurity, calling the latter a "pervasive problem."

"Our program managers need to be thinking about cybersecurity through the life cycles and every aspect of the programs, whether it's the supply chain, logistics systems, or weapons systems," the undersecretary said. "All of those interfaces have to be [considered]."

Incentivizing contracts and stressing innovation and productivity have proven effective in government and industry partnerships, Kendall said. "We do want to align profit with performance; if you do a better job for us, you should make more money," he added. "We like to incentivize contracts where they apply [and] think about the contract we need for the job that we're doing."

Kendall also told the audience that Better Buying Power 3.0 calls for greater leverage of commercial technology, acknowledging that the private sector moves faster than the Defense Department's normal development cycle.

"We can take more risks and speed it up a bit, but it fundamentally takes longer to do a complex new weapons system," he explained. "We need to think about making revisions on our designs to bring technology in as it matures."

### **Reassessing Research and Development Costs**

Better Buying Power 3.0 also includes reassessment of the Defense Department's research and development expenditures, Kendall said. This includes increasing control and reducing bureaucracy in internal lab and independent research and development processes, he added.

The latest version of Better Buying Power also documents the Department's commitment to science, technology, engineering, and mathematics, the undersecretary told the audience. "Our economic welfare and national security depend upon the creativity of people in these fields and the products and ideas they bring to the table," he said.

### **F-35 Program 'On Right Track,' Director Says**

DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 15, 2015)

Terri Moon Cronk

WASHINGTON—Despite its numerous setbacks, the F-35 Lightning II Joint Strike Fighter program is on the right track to meet aircraft delivery deadlines, the program's executive officer told a House Armed Services Committee panel yesterday.

Air Force Lt. Gen. Christopher C. Bogdan updated members of the committee's tactical air and land forces subcommittee on the F-35 program as part of the president's fiscal year 2016 budget request.

### **Slow, Steady Progress**

"Our overall assessment is we're making slow but steady progress on all fronts, and each day, the program is improving," Bogdan said. "This is not to say that we don't have some risks, challenges and difficulties, but I'm confident we'll be able to overcome these problems and deliver on our commitments."

That progress covers development, flight training, production, maintenance, and the standup of the global sustainment enterprise, he said.

Bogdan also said the program is nearing completion of its flight testing to field initial warfighting capabilities, even though certain software issues and other issues have created delays.

### **Setbacks, Accomplishments in 2014**

"The last year also presented [some] failures," Bogdan said, citing an engine failure at Eglin Air Force Base, Florida, and the discovery of cracks in the F-35's B-model bulkhead during durability testing. "We're working hard to bring this schedule delay back in on time and we don't believe it will impact [delivery to the Services]," he added.

Bogdan cited the F-35's accomplishments in the last year. Initial sea trials aboard the *USS Nimitz* for the F-35C model produced "excellent" performance results, Bogdan said, and production of the F-35 went according to plan.

### **Delivered as Promised**

"We planned on delivering 36 [aircraft in 2014], and delivered 36 to our warfighters," Bogdan said. "We have now delivered a total of 130 aircraft to our operational test and training sites."

The production line is running about two months behind, the general acknowledged, but he added that the process is

catching up and said the delay does not pose any long-term schedule or delivery risks to the program.

"We intend to continue leading the program with integrity, discipline, transparency, and accountability," Bogdan told panel members. "We will hold ourselves and our program team accountable for the outcomes of this program."

### **SECNAV Announces Department of the Navy Innovation Vision**

SECRETARY OF THE NAVY PUBLIC AFFAIRS (APRIL 16, 2015)

NATIONAL HARBOR, Md.—Secretary of the Navy Ray Mabus unveiled the Department of the Navy's (DoN) Innovation Vision during remarks delivered at the annual Sea, Air, and Space Exposition April 15.

"The superiority—in technology and concepts—the Navy and Marine Corps have on, over, under, and coming from the sea did not just happen," said Mabus. "There have been more than two centuries of collaboration and experimentation among people in and out of uniform, in government and industry, redefining what is possible. In so many cases, we have taken seemingly impossible ideas and made them real."

One theme of Mabus' remarks was that, despite the centuries of innovation that have contributed to the success of the Navy and Marine Corps, the time has come to reinvigorate that culture while breaking down existing barriers to new ideas and concepts.

"The world is getting faster, more nimble, and is changing exponentially—the world that is too often, with the exception of the United States military," he said. "If we do not free ourselves from the ever-expanding, ever-tightening coils of bureaucracy, if we do not set the pace on adopting change, if we continue to think and do in the same ways we have for so long, then our days as the world's pre-eminent maritime force are surely numbered—and that number is small and shrinking."

The initial push toward a DoN better equipped to adopt and incorporate innovation at a quicker pace began earlier this year when Mabus established a special group tasked with focusing on these ideas.

"In January, I established the Navy's Task Force Innovation: a group from across the Department comprising thinkers, experts, and warfighters with diverse backgrounds and from every level," said Mabus. "We have a long tradition of creativity, and we have exceptionally talented people in the Navy and Marine Corps. I've charged this Task Force with harnessing that creative energy of our sailors and Marines

and infusing the ideas that come forward into our operations.”

Following months of study and collaboration with the fleet, other governmental organizations and the private sector, the task force reported their results and recommendations to Mabus who established five key focus areas designed to make the DoN a more innovative organization.

The first of these areas is to establish an innovation network for the Department of the Navy. “This innovation network will be the scaffolding used to ensure coordination and get rid of barriers to progress,” said Mabus.

The second is to reform how the Department manages its workforce and talent. “We need to be evaluating and rewarding our top performers appropriately to show them we value the knowledge, talent, and risk-taking they bring to the fight,” Mabus said.

The third focus area is to use the massive amounts of data collected by the DoN in a better way.

The fourth is to get emerging operational capabilities to the fleet much more quickly. “As we enter the age of cyber, unmanned systems, and advanced manufacturing, we cannot allow these overly complex, form-over-substance, often useless, and too often harmful, practices to slow or prevent development of some game changers, while simultaneously giving our potential adversaries the competitive advantage,” said Mabus.

He also pointed out that this shift toward a culture more focused on innovation was about more than simply new weapon systems or platforms, but also about changing the way the Department as a whole thinks.

The final focus area is to create breakthrough warfighting concepts.

For the next several months, Mabus also announced, the Department of the Navy will highlight a new innovation in the fleet every day.

For more news from the Secretary of the Navy, visit <http://www.navy.mil/secnav/> or <http://www.facebook.com/secretaryofthenavy>.

### **Work: Space Domain Presents Challenges, Threats**

*DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 16, 2015)*

*Jim Garamone*

ABOARD A U.S. MILITARY AIRCRAFT—In a candid and passionate speech, Deputy Defense Secretary Bob Work yesterday asked members of the space community to help the United States maintain its edge in the space domain in the 21st century. Work spoke to more than 200 people from industry and government at the annual Space Symposium in Colorado Springs, Colo.

The space domain is an increasingly important area for the U.S. military, the U.S. Government, and the American people, the deputy secretary said.

### **‘Space Architecture Faces Increasing Risks’**

“Space architecture faces increasing threats and together we must think about those challenges,” Work said in his speech. The world is seeing a reemergence of strategic competition, which was dormant since the end of the Cold War, a senior defense official said, speaking on background.

Since the end of the Cold War, space has been a relatively benign environment, but that has changed, the official said. China, for example, tested an anti-satellite capability in January 2007, destroying one of its weather satellites as it traveled more than 500 miles above the Earth, the official said.

Russia also has capabilities that could reach into space, and the United States can no longer assume that space will not be contested, the official added.

Work stressed that the U.S. national security space architecture is resilient, but it is facing increasing threats, and America must think about and act on those challenges.

### **‘Space is Deeply Enmeshed in Our Force Structure’**

“Space is deeply enmeshed in our force structure and is central to our way of deterring, assuring, and warfighting,” the deputy secretary said.

The U.S. military cannot be complacent and must emphasize space control as challenges arise, he said.

Officials said that to maintain dominance in space, the United States “must consider all space assets, both classified and unclassified, as part of single constellation. And if an adversary tries to deny us the capability, we must be able to respond in an integrated, coordinated fashion.”

The deputy secretary stated the ultimate goal for the United States is to maintain space capabilities, through all phases



Air Force Gen. John E. Hyten, commander of Air Force Space Command, right, and Secretary of the Air Force Deborah Lee James, center, greet Deputy Defense Secretary Bob Work as he arrives at the Scitor Complex to attend and speak at the Space Symposium in Colorado Springs, Colo., April 15, 2015.

DoD photo by U.S. Air Force Master Sgt. Adrian Cadiz

of conflict, regardless of actions to deny the ultimate high ground.

The symposium was a perfect place for such a candid talk, the official said on background. Those in the space industry know they are important to the nation, “but it was a call for them to think hard about the future of national security in space.”

Work asked the audience to look at how the nation thinks of deterrence and stability in this emerging world where space assets might be held at risk.

“It was a really positive and candid interchange,” the official said. “It was not your average bureaucratic speech. [Work] was very animated and passionate about this issue. Space, cyber, [and] nuclear are core issues for us as a nation.”

### Protecting Space Assets

In an environment where space assets are at risk, “you want to be able to be sure that the [space] community is thinking about how to protect them and the services they provide,” the official said. Industry and government must work together on the design and architecture of space systems, the

official said, to make them perform better and make them less vulnerable.

Defense Secretary Ash Carter and Work have consistently stimulated strategic thinking in the Department, and this has cut across all domains, the official said, noting a common factor in the domains is the contribution from space.

“You can’t be serious about strategic thinking and about deterrence in the 21st century if you are not talking about space,” the official said.

Looking at the core elements of what DoD does to defend America, its allies, and its interests, it is clear that space is increasingly important, according to the official.

“Strategy dictates that if something is getting more important to core objectives, it has to place higher on your hierarchy of needs,” the official said. “It’s important that we manage it in the right way.”

### AF Acquisition: Investing Now to Win the High-end Fight of the Future

*Office of the Assistant Secretary of the Air Force for Acquisition (April 20, 2015)*

WASHINGTON—How does Dr. William LaPlante, the Assistant Secretary of the Air Force for Acquisition, apply his 29 years of defense technology experience to improve a \$32 billion research, development, and acquisition portfolio? That is the question he sought to answer.

LaPlante had recently completed a meeting focused on shaping an experimentation campaign strategy for the Service, which would be the first topic of discussion.

“Our experimentation strategy is critical to our Service investment strategy and efforts to prepare for what our Chief of Staff [of the Air Force] Gen. [Mark A.] Welsh [III] refers to as the ‘high end fight of the future,’” LaPlante said.

“I have had the good fortune of working with some exceptionally talented visionary leaders in my role as the Service Acquisition Executive,” he said. “I don’t exaggerate when I say our Secretary of the Air Force [Deborah Lee James] and chief of staff are truly acting as the architects of our future. In

their Air Force strategy document 'A Call to the Future,' they lay the foundation for what we must do to continue to be the world's greatest Air Force into the 2040s and beyond."

LaPlante added, "I take very seriously my role, and that of the acquisition enterprise, to ensure our legacy capabilities maximize our warfighting performance in the near term, and that critical game changing technologies will be mature and available for our warfighters to win that high end fight of the future. That means we have to be the best at sustaining aging systems that are still relevant and effectively giving us an edge over our adversaries today.

"We must also be expert at planning and initiating highly successful modernization programs that are in the pipeline presently," LaPlante continued. "Without question, we must be the best in the world at working with our warfighting partners to explore how highly advanced and cutting-edge technologies can be used in concert with new warfighting tactics, techniques, and procedures developed in order to enable measurably increased warfighting capabilities in the future. This is the essence of experimentation."

LaPlante explained experimentation, along with efforts he is championing to return to the Service's roots in developmental planning, is very important to modernization and technology investment strategies and feature prominently in his acquisition priorities.

He explained, "As the senior Air Force acquisition executive, I have established a framework of priorities for the enterprise to underpin these necessities. I am attempting to improve the performance of the acquisition portfolio with five simple priorities: getting high-priority programs right, improving stakeholder relationships, owning the technical baseline, 'Better Buying Power,' and strategic agility."

In a world driven by instant gratification, much of LaPlante's vision will unfold over the next 20 years. He knows enduring and emerging powers have the potential to become destabilizing forces, and to meet those challenges his acquisition agenda must continue modernizing the nation's capabilities to sustain its operational and technological edge.

### Getting it Right

"Fundamentally, I believe we have a solemn responsibility in the acquisition enterprise to get all programs started right," LaPlante said. "We want to ensure we deliver products on schedule, on cost, and have them delivered within the specified timeframe because these are the programs we are going to be living with for the next 50 or so years."

Specifically, he's talking about the Air Force's three highest priority systems, which are in various stages of development: The F-35 (Lightning II), with initial operating capability anticipated for August 2016; first flight of the KC-46A (Pegasus) this summer; and the Long-Range Strike bomber, currently in source selection with contract award also anticipated this summer.

"I realize people instinctively understand these are the huge dollar programs we're investing in," he said. "The future of the Air Force and its ability to be effective in the high-end fight of the future depends on the successful and timely fielding of these capabilities."

### Improve Stakeholder Relationships

Coming from a federally funded research and development center background, LaPlante knows the power of working together on common issues. To that end, when a difficult challenge comes up, it's important the customer and supplier partners know each other and that they know how to work together to solve problems.

One of those problems is the ever increasing cost of weapon systems. LaPlante has taken on this issue for the Air Force. Working with key industry leaders, LaPlante and his acquisition team are committed to working with industries to "bend the cost curve" (BTCC) to identify areas of increasing costs and work to drive those costs down.

Teams have been formed to exploit a set of best practices where internal processes are improved, industry interactions throughout the acquisition life cycle are enhanced, and competition between traditional and non-traditional industry partners is expanded.

One of the things LaPlante noticed when he arrived at the Pentagon two years ago, was a disparate view of ground truth regarding how well the Air Force executes its major programs. There was a marked disparity about this between Pentagon insiders and the external perceptions of outsiders who monitor these programs. One example is the perception about contract award performance.

LaPlante said he was pleasantly surprised at the progress the acquisition enterprise made in reducing the number of sustained contract award protests in recent history.

"All too often people judge us today on very public past failures with programs like KC-X and CSAR-X contract award protests," he said. "Those challenges occurred nearly a decade ago and the Air Force has worked hard to improve its contract award performance since then."

In order to ensure the enterprise meets the warfighter's needs, acquisition leaders have implemented extensive source selection process improvements—improvements like enhanced source selection training, the use of multi-functional independent review teams to “red-team” source selection work, and extensive peer reviews of source selection results. These measures have served to minimize protests against contract awards.

“Protests of an awarded contract can impact the Air Force mission, delaying systems fielding, and is often a lengthy process,” said Theodora Hancock, the senior Air Force procurement analyst deputy assistant secretary for contracting.

In fiscal year 2007, the Air Force had a protest sustainment rate of 7 percent. With the new processes in place the protest sustainment rate has been reduced in 2014 to 1 percent. The overall sustained contract protest rate for the federal government as a whole, by comparison, is 13 percent.

“This is an amazing improvement,” LaPlante said. “One you just don’t hear people talking about enough. The fact that this performance improvement isn’t known by external stakeholders and partners emphasizes the need for increasing transparency and improving stakeholder relationships.”

One of the new activities designed to improve stakeholder relations is the BTCC initiative. In 2014, Air Force leaders initiated BTCC to address the escalation in weapon system costs and development times.

To accomplish this BTCC amplifies the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L) Frank Kendall’s Better Buying Power (BBP) principles by encouraging innovation through active engagements with industry and the acquisition workforce to identify, evaluate, and implement transformational reforms.

Unlike BBP, which is a broader set of practices and techniques for the workforce to employ, BTCC is a targeted initiative to encourage innovation and active industry partnerships to improve the way we procure our systems and to drive down costs. What began as a series of discussions with industry has evolved into an ever growing set of targeted actions aimed at addressing the most critical challenges within the acquisition process.

### **Owning the Technical Baseline**

According to LaPlante, during the 1990s the acquisition workforce was significantly reduced, with the Air Force losing much of its organic engineering and technical skills. It was forced to abdicate part of the “Holy Grail of technical

systems knowledge” to defense contractors who began serving as lead systems integrators and the keepers of systems knowledge and technical expertise.

As a result, the Air Force grew dependent on its contractors for help in solving problems, performing systems modeling, and making key decisions regarding the modification of legacy systems.

“The difficulty with this, is that as a result, the vendors developed a relative monopoly on sustainment, parts, etc., which ultimately led to relative price increases in the services and products the government needed to modify or sustain its systems,” LaPlante said.

“We in essence lost a generation of technical expertise and experience, and now we want to take back ‘ownership’ of the technical baseline for our systems,” he continued. “If we own it, we have the ability to control our own destiny.”

As a result, LaPlante is championing measures to increase technical skills and capabilities within the program offices, and is challenging his program leaders to ensure they procure the appropriate systems data rights at the outset of programs to facilitate government efforts to own the technical baseline.

The initiative is formally referred to as Owning the Technical Baseline. LaPlante has commissioned a national academies study on the subject that should be reporting out very soon. OSD AT&L has also adopted the initiative as part of the new BBP 3.0 activity.

### **Better Buying Power**

The Air Force acquisition enterprise is benefiting from OSD’s Better Buying Power set of techniques and practices. As far as the Air Force is concerned, it is ‘all in’ with respect to using BBP principles. LaPlante noted one they are using to considerable effect is Should Cost.

Should Cost is a management tool designed to proactively target cost reduction and drive productivity improvements into programs.

“I am very happy with the Air Force’s [fiscal year 2014] Should Cost performance, which has identified realized savings of \$1.4 billion,” LaPlante said. “While this is a tremendous start, I continue to challenge all program executive offices [PEO] and program managers to seek out additional Should Cost opportunities, reaping as much as possible from our current portfolio investments. This is one initiative where we can see tangible evidence of our efforts to increase war-

fighting capabilities within available funding, and to obtain the best business deals possible for the American taxpayer.”

### **Strategic Agility**

LaPlante is aware the basic acquisition environment involves dealing with constant change and the challenges that come with prediction failures.

“The threat is going to change, technology is going to change, and warfighters will discover different ways to use their equipment,” he said. “In order for us to ensure our weapon systems, which we have historically taken 15 to 20 years to develop, can accommodate these uncertainties, we must design systems from the outset that are adaptable.

“We must design-in the ability for these systems to be modified, perhaps in ways that we may not be able to anticipate now, but will discover in the future,” LaPlante continued. “This fundamentally means we must embrace adaptability, a foundational underpinning of strategic agility, as a basic precept for how we develop, procure, and sustain our weapons systems.”

LaPlante explained, “I have challenged our PEOs and program managers to capitalize on key principles of adaptable systems when they are initiating programs,” he said. “These principles include: open systems architectures, modularity, speed to fielding, and block upgrade strategies.

“In fact,” LaPlante stated. “We have identified two programs that will serve as strategic agility [adaptability] pilots for the Air Force: our new T-X trainer aircraft and Joint Stars Recapitalization program. With the T-X, we intend to take advantage of open systems architecture, a modular software design, and low risk and rapid production. For JSTARS Recap, we intend to capitalize on a modular and open systems architecture design and maximize the use of mature technologies to reduce development cycle time.”

The acquisition community is focused on investing in an array of programs, platforms, and innovative opportunities to ensure the Air Force remains effective, he said.

“This is an exciting time to be engaged in Air Force acquisition,” said LaPlante. “Our workforce is energized and they are really doing amazing things to make a difference.”

Overall, the leader of the Service’s acquisition system is pleased in the efforts to revitalize the Air Force’s acquisition performance.

“Our challenge, however, remains striking the proper balance between efforts to ensure world class sustainment performance for legacy systems and investing the right intellectual and resource capital in the capabilities required to win the proverbial high end fight of the future,” LaPlante said.

“We have to use the right tools and disciplines now, to ensure we are developing and fielding the right systems that need to be there for us to win that future fight,” LaPlante said. “Knowing threats are going to change as we are working on these systems, we need to be able to pivot to affect the new threats that we can’t even see today that we know will be out there in the future.

“We’ve got the right vision and strategy, and we can’t lose when they are powered by our world-class acquisition workforce serving as the engine for positive change.”

### **AFRL Redesigns Mock UAV, ‘Surrogate Predator’**

*AIR FORCE RESEARCH LABORATORY (APRIL 22, 2015)*

*Jeanne Dailey*

KIRTLAND AIR FORCE BASE, N.M.—The Air Force Research Laboratory’s Surrogate Predator program has given the warfighter a way to train in the United States before deploying overseas.

AFRL’s Directed Energy Directorate at Kirtland modified a Civil Air Patrol Cessna 182 aircraft to be used for military training exercises. The Surrogate Predator has intelligence, surveillance, and reconnaissance sensors that provide the capability to mimic a Predator unmanned aerial vehicle.

CAP is the official auxiliary of the Air Force with 60,000 members nationwide, who operate a fleet of 550 aircraft. CAP members perform about 85 percent of continental U.S. inland search and rescue missions, as tasked by the Air Force Rescue Coordination Center, which credits CAP with saving an average of 70 lives each year.

CAP members also perform homeland security, disaster relief, and drug interdiction missions at the request of federal, state, and local agencies.

AFRL, which has been part of the Surrogate Predator program since 2008, recently completed and delivered the Enhanced Surrogate Predator 3 to CAP, according to program manager J. P. Sena.

“The Enhanced Surrogate Predator 3 is a redesign of the first two Surrogate Predators, which had a wing-mounted turret,” Sena said. “We designed the Cessna 206T with a retractable turret stowed in the belly of the aircraft that allows for



An enhanced Surrogate Predator 3 is prepared for takeoff. Intelligence, surveillance, and reconnaissance sensors were added to the Cessna 182 so it can mimic a Predator unmanned aerial vehicle. Air Force Research Laboratory's Directed Energy Directorate at Kirtland Air Force Base, N.M., modified the Civil Air Patrol aircraft for use in military training exercises.

Courtesy photo

longer flight times by reducing drag when the turret is not in operation. The operator station was also designed with ergonomics in mind to allow for more leg room, ease of controls, central location for all the equipment, and a plethora of capabilities for the sensor operator."

The Surrogate Predator is used in green flag exercises, where the Air Force and its allied air forces engage in air-land integration combat training exercises.

"With the use of the Surrogate Predator during green flag exercises, troops training for deployment get experience with what they will see overseas while the government can keep the high-value assets overseas to continue to complete missions," said Sena. "Our government saves millions by keeping the assets in theater and completing training using the Surrogate Predators."

In addition to its use as a military training aircraft, CAP has used the Surrogate Predators 1 and 2 in relief efforts for disasters such as Hurricane Sandy in 2012.

Kirtland is home to three CAP squadrons. "The capabilities of the Enhanced Surrogate Predator will far exceed the previous two, and I'm sure will be used in countless other ways to support the CAP mission, as well as the U.S. Government," Sena said.

### **Service Acquisition Chiefs Testify on Reform**

*DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 23, 2015)*

*Army Sgt. 1st Class Tyrone C. Marshall Jr.*

WASHINGTON—Top acquisition officials from the Army, Navy, and Air Force testified before Congress yesterday on their collective efforts to make the defense acquisition process more effective and responsive to national security needs.

Heidi Shyu, assistant secretary of the Army for acquisition, logistics and technology; Sean J. Stackley, assistant secretary of the Navy for research, development and acquisition; and William A. LaPlante, assistant secretary of the Air Force for acquisition all appeared before the Senate Armed Services Committee's subcommittee on readiness and management support.

### **Industry Versus Government**

Shyu contrasted her experiences in industry and government and urged Congress to empower program managers with the authorities necessary to be more agile in guiding programs to successful completion.

“Defense acquisition is a highly risk-averse, compliance-based process with a checklist mentality that has become unduly cumbersome,” she said. “Prior to my service to the government, I spent 33 years working with the defense industry.”

Shyu explained that she controlled her own budget, held a reserve budget, and had the flexibility and “trade space” to identify impacts of performance versus cost, schedule, and technical risks.

On the government side, she said requirements are derived or changed without the full knowledge of cost, schedule, or technical risk to the program.

Shyu also noted that on the government side, she’s encountered cumbersome paperwork requirements, slow hiring, changes to operational testing without consideration to program impacts, and lack of flexibility to offer financial incentives.

### **Stark Differences**

A stark difference, she noted, is what happens when a program runs into problems. “What happens in industry?” she asked. “Everybody would jump in to bail out the program manager, because you are bleeding cash. There’s a financial incentive to reduce loss, so everybody helps out the program manager.”

In government, she said, it becomes “an opportunity to actually take the program manager’s money and use it for their stove-pipe purposes.”

Shyu cited this “fundamental” lack of program manager authority, coupled with “failure to properly align the various stakeholders’ responsibilities” as the factor that most heavily has contributed to the critical shortcomings in the acquisition process.

“I urge Congress,” she said, “to empower the [program managers] with the authority needed to help them guide the program successfully to completion in a manner that’s similar to industry in which I could move very rapidly.”

### **Making Every Dollar Count**

Stackley said the cost of delivering “extraordinary capability” to the warfighters is proving increasingly difficult for the nation to bear.

He noted former Defense Secretary Robert M. Gates for his 2010 warning that “given America’s difficult economic circumstances and perilous fiscal condition, military spending on things large and small can and should expect closer, harsher scrutiny.”

Shortly after that came the tenets of what is known today as the Defense Department’s Better Buying Power initiative, Stackley said.

“So today,” he added, “in building our budget, every program—things large and small—is subject to answering four most basic questions: What will it cost to buy it? What will it buy us in performance? What can we afford? And what can we do to make it more affordable? Simply put, we must change the cost equation.”

He cited five basic principles: get the requirements right, perform to a stable plan, make every dollar count, build a skilled and experienced acquisition workforce, and foster a healthy industrial base.

As Gates said, what is necessary is a willingness to make hard choices, Stackley told the panel.

### **Speed the ‘Fundamental’ Metric**

LaPlante said speed is the fundamental metric in discussing agility and adaptability in acquisition. “If you can do things fast, do it fast,” he said. “Failing fast is better than doing things slow that may or may not succeed.”

LaPlante also noted “promising signs” in acquisition reform, calling them “good things that should be built upon.” He added, “I am always a believer in looking at what’s going well and building upon it.” The Better Buying Power initiative that Defense Secretary Ash Carter initiated when he was the Pentagon’s acquisition chief now carried forward with Frank Kendall, the present undersecretary of defense for acquisition, technology and logistics, are paying off, he said.

“The ‘should-cost’ savings that all three of our Services are having are real, and they’re incredible,” LaPlante said. He emphasized that these savings do not fall into the cost avoidance category.



William A. LaPlante, assistant secretary of the Air Force for acquisition, testifies before the Senate Armed Services Committee's subcommittee on readiness and management support in Washington, D.C., April 22, 2015.

DoD photo

"People sometimes say it's cost avoidance," LaPlante said. "No. Very specifically, they are real savings [that are] paying off."

### Using Nontraditional Methods

LaPlante also said the Air Force has done some outreach in nontraditional ways to bring in academia or small businesses.

DoD Instruction 5000.02, signed Nov. 26, 2013, by Carter on his last day as deputy defense secretary, is designed to help in streamlining the acquisition process, LaPlante said.

"We're trying things in the Air Force," he added, "and I know the other Services are, outside of the acquisition [instruction], doing something that that's called 'other transactional authority.' We're doing an experiment next month on one of our systems to try to get folks under contract within a week if they impress us with one of their algorithms."

Experiments like these need attention and encouragement, LaPlante said.

### DoD Officials Discuss Science, Technology Budget

DOD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 24, 2015)

Cheryl Pellerin

WASHINGTON—The Defense Department has maintained a steady \$12 billion investment in science and technology and is using new initiatives to boost innovation and military superiority, defense officials told a Senate panel April 22.

Frank Kendall, undersecretary of defense for acquisition, technology and logistics, testified before the Senate Appropriations defense subcommittee on the DoD budget request for fiscal year 2016.

Joining him were Alan Shaffer, acting assistant secretary of defense for development, research and engineering, and Steven Walker, deputy director of the Defense Advanced Research Projects Agency, or DARPA.

The Department's science and technology budget request for fiscal year 2016 is \$12.2 billion, Kendall said.

### **Steady Investment**

“Over the last several years we have maintained, despite all the budget fluctuations, a fairly steady investment in terms of technology,” he said.

The Department is committed to pursuing innovation in all its dimensions, said Kendall, adding that Defense Secretary Ash Carter endorsed the Defense Innovation Initiative unveiled last fall, and yesterday at Stanford University the secretary announced steps the Department will take to foster innovation.

Kendall’s efforts cover the broader DoD acquisition enterprise, and two weeks ago he announced final details and implementation guidance for Better Buying Power 3.0. “The Better Buying Power label originated when Dr. Carter was undersecretary for acquisition, technology and logistics ... but it’s really a collection of initiatives that has evolved over time,” Kendall said.

### **Improving DoD Acquisition**

The initiatives are designed to incrementally improve the acquisition system’s performance, he said.

The acquisition system includes not only major DoD programs, Kendall said, “but everything—all the things we contract out for, all the things the Department acquires ... and services are more than half of the things we contract out for. And it certainly includes our science and technology investments.”

Kendall said the most recent version focuses on innovation, technical excellence, and technological superiority, and on taking steps to spur innovation and get the greatest value from research and development, and from new innovation sources.

The efforts, he added, include science and technology accounts, DARPA’s budget, the work of DoD labs, contracted research and development, reimbursable independent research and development conducted by industry, the Small Business Innovation Research Program, and others.

### **Incentivizing Industry**

Several BBP 3.0 provisions are designed to incentivize industry, Kendall said. “One of them is ... to tell industry how much we’re willing to pay for enhanced performance,” he said.

Normally when the Department asks for a weapon system proposal, it sets a level of threshold performance that is the minimum it will accept, Kendall explained. DoD also sets an

objective—the performance it desires and that comes with a higher price, he said.

“Industry almost uniformly bids to the threshold level and ignores the objective because the threshold level is always cheaper,” he added, noting, “It’s less capable and that goes with [the lower] cost.”

The undersecretary said the Department is starting to communicate to industry “how much more we’re willing to pay for that higher level of performance. Industry can then make an informed judgment about whether or not to invest in technology that will get to that level of performance.”

Without that information, Kendall said, there’s no incentive for industry.

### **More Creative Products**

“We’re trying to involve industry earlier-on in concept definition and requirements formulation so we have an interaction with industry.” Kendall said. “We give industry a head start ... to work on how they would satisfy our requirements.”

In general, he added, “we’re trying to align our financial incentive structure with the things we want. In this case, what we want is innovation—more creative, more capable products that we can get to the warfighter.”

In his remarks, Shaffer said his office has revised the way it plans and executes the science and technology program through Reliance 21.

Reliance 21 is “an oversight construct that has created communities of interest, bringing scientists working in specific technology areas together to jointly plan and execute their Department-wide program in a more effective way,” he said.

### **Defense Innovation**

Shaffer said his office also is directly involved in the Defense Innovation Initiative and in many specific initiatives under BBP 3.0.

He said the DII is a Department-wide effort to identify and invest in novel ways to sustain and advance military superiority for the 21st century and improve business operations. Under BBP 3.0, he said, “we are more tightly coupling acquisition requirements and the intelligence community to more dynamically adjust to changes in potential threats,” and addressing barriers to adopting commercial technology in systems and capabilities.

Shaffer said his office is increasing its use of prototypes and experimentation Department-wide to reduce technical risk early in a program cycle and to see how systems will operate. The office also is expanding the use of modular open-systems architecture to stimulate innovation.

### Breakthrough Technologies

In his remarks to the panel, Walker said DARPA's role is to make early pivotal investments that help develop breakthrough technologies for national security.

Walker highlighted two programs that DARPA is working on with the Air Force, both in hypersonics, referring to a flow of air with a Mach number greater than five. This means the flow speed is more than five times the speed of sound, he explained.

One program is the Tactical Boost Glide system, Walker said. This DARPA-Air Force effort will develop and demonstrate technologies to enable air-launched tactical-range hypersonic boost glide systems, including a flight demonstration. Basically, Walker said, "you boost it with a rocket and glide the system to the target."

### Tactical Hypersonics

The second DARPA-Air Force effort is the Hypersonic Air-breathing Weapon Concept, designed to enable transformational changes in responsive, long-range strike against time-critical or heavily defended targets.

"You also boost that concept," Walker said, "that you then take over with the air-breathing scramjet engine on board and that also hits its target."

This program, according to DARPA, seeks to advance air vehicle configurations capable of efficient hypersonic flight, enhance hydrocarbon scramjet-powered propulsion to enable sustained hypersonic cruise, develop affordable system designs and manufacturing approaches, and more.

"What [hypersonic speeds] buy you is a strike capability for time-critical targets from long-standoff ranges," Walker said. "If we can pull that hypersonic technology into a weapon-system concept ... at the end of these programs the Air Force would be ready to go off into an acquisition program on those systems—potentially, if we're successful. That's really the future," he added.

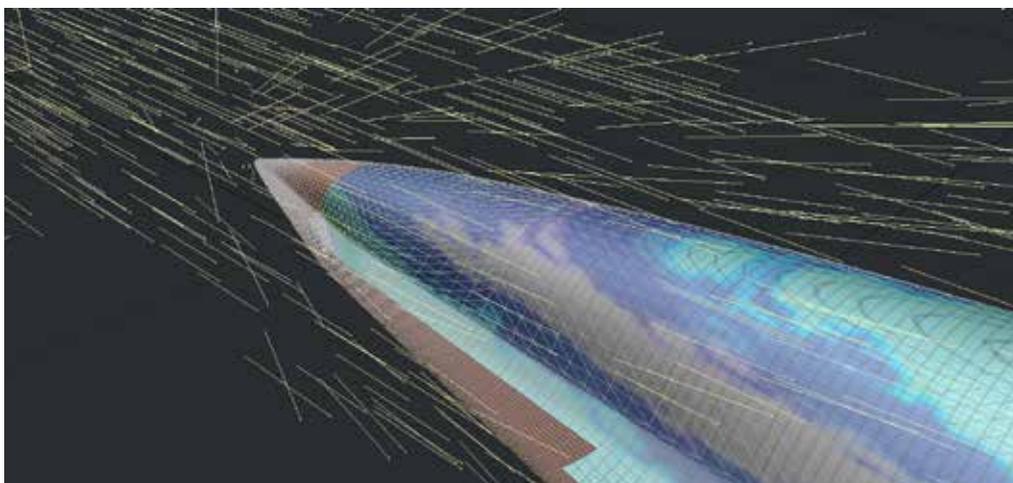
### The Sequestration Threat

During the hearing, Kendall told the panel that one threat to U.S. military superiority is "one of our own making. It is the threat of sequestration."

In the fiscal year 2016 DoD budget request, the Department is asking for funding that is well above sequestration levels, he said.

"We are trying to recover some of the readiness that was lost when sequestration was implemented in 2013. We are also trying to acquire some of the capability we need to maintain to remain competitive," said Kendall, adding that the Department is requesting increases in its investment accounts, research and development, and procurement of about \$20 billion.

"Sequestration would force us to prioritize pressing near-term needs at the expense of these investments, preserving capability now but increasing our risk in the future," he said, adding that uncertainties about future budgets make effective planning nearly impossible.



The Defense Advanced Research Projects Agency's research and development in stealth technology during the 1970s and 1980s led to the world's most advanced radar-evading aircraft, providing strategic national security advantage to the United States. Today, hypersonic technologies have the potential to provide the dominance once afforded by stealth to support a range of future national security missions.

DARPA photo

“We urge you to permanently repeal the threat of sequestration,” Kendall told the senators. “Removing this specter would do more than any other single act to spur innovation and preserve our military technological superiority.”

### Carter Visits Silicon Valley Companies to Enhance DoD Technology Innovation

DoD NEWS, DEFENSE MEDIA ACTIVITY (APRIL 25, 2015)  
Claudette Roulo

WASHINGTON—Defense Secretary Ash Carter wrapped up a two-day trip to California’s Silicon Valley, where he focused on renewing the longstanding relationship between the Defense Department and the wellspring of technology innovation found in that part of the nation.



Defense Secretary Ash Carter stands in front of the Facebook wall during his visit to the company’s headquarters in Menlo Park, Calif., April 23, 2015. Carter is on a two-day trip to Silicon Valley. Before visiting the company, Carter delivered a lecture at Stanford University, where he unveiled the Defense Department’s new cyber strategy.

DoD photo by Army Sgt. 1st Class Clydell Kinchen

“Across the board, ... there’s a lot going on out there,” he said, “in energy, in social media and talent management and lots of fields that matter across our technology base.”

Carter met with senior executives at Facebook to discuss the potential for social media to connect commanders, troops, and family members not only during deployments, but to also create “communities of interest.”

He also met with Facebook employees who are also veterans to discuss “creating a two-way street between innovative talent in the private sector, and our need for innovative talent in the Department of Defense, not just the military, but the civilian part as well.”

DoD’s personnel system doesn’t favor the kind of career flexibility preferred by people entering today’s workforce, the defense secretary said.

“They like choice. They like openness. They like to move around. And therefore the ability to come in and come out, particularly in these highly technical areas, is really important,” Carter said.

He said the Department is working to create “tunnels” between DoD and industry to encourage innovative people to try out government service. “We’re going to see how it works and then scale it up if it does work,” the defense secretary said. “And I’m just determined that we drill the holes in the walls that have developed between our two domains.”

“I find people out there very eager to contribute,” he said. “They care about national security, but they have their own style of operating in it ... We need to be compatible with that.”

In addition to a mutual desire to attract talented and creative employees, the Defense Department and technology companies have something else in common, Carter said. Technology management—ensuring research and development are both valued and productive—is an issue in both the private and public sector, he said. “It’s an everyday problem for the tech industry, where ideas are one thing; commercialization is another. So, we have a common set of issues in that regard,” the defense secretary said.

Carter also met with the heads of Andreesen Horowitz, a venture capital firm, to discuss their efforts to build bridges between Silicon Valley and Washington.

The future of the finest fighting force in the world will depend upon the Defense Department's ability to attract talented people and build the best defense technology, he said. "So I'm sure there'll be more trips and more innovation by us," the defense secretary said. "We have to do things differently, but we can continue to be as effective, and I'm determined that we'll do that."

In addition to visiting innovative technology firms, Carter delivered a lecture at Stanford University on April 23, in which he unveiled the Defense Department's new cyber strategy to guide the development of DoD's cyber forces and to strengthen its cyber defenses and its posture on cyber deterrence.

### **Work Talks Defense Innovation During New England Trip**

*AIR FORCE CIVIL ENGINEER CENTER PUBLIC AFFAIRS (MAY 12, 2015)*

*Cheryl Pellerin*

WASHINGTON—During a two-day domestic trip to Maine, Massachusetts, and Rhode Island, Deputy Defense Secretary Bob Work spoke with military, academic, and industry officials, troops, and students about defense innovation and regional security.

The trip began at the U.S. Naval War College and the Naval Undersea Warfare Center in Newport, R.I.

The college, on Coasters Harbor Island in Narragansett Bay, has several missions. These include developing strategic and operational leaders, helping the chief of naval operations define the future Navy, strengthening maritime security cooperation, and supporting combat readiness.

While he was there, Work visited the Halsey Alpha Research Group and China Maritime Studies Institute, and met with students.

### **China Maritime Studies Institute**

Halsey Alpha is a student-faculty research effort that uses military operations analysis and free-play war gaming to examine high-intensity conventional warfare.

The China Maritime Studies Institute increases knowledge and understanding of the maritime dimensions of China's rise.

Discussions there focused on the Defense Innovation Initiative, a Department-wide effort to sustain and advance regional security and the nation's military dominance for the 21st century.

### **Navy Research**

At the Naval Undersea Warfare Center, Work visited the Navy's full-spectrum research, development, test and evaluation, engineering, and fleet support center.

The center supports submarines, autonomous underwater systems, and offensive and defensive weapon systems associated with undersea warfare and related areas of homeland security and national defense.

At the center, he also received briefings about capabilities and innovation, including unmanned systems, torpedoes, and electronic warfare.

### **Applying Technology to National Security Activities**

The next day Work visited Boston, Mass., and Bath, Me. In Lexington, near Boston, Work visited the Massachusetts Institute of Technology Lincoln Laboratory, a federally funded research and development center, to see firsthand ongoing efforts to apply advanced technology to national security activities.

Research and Development (R&D) there focuses on long-term technology development and rapid system prototyping and demonstration. The lab works with industry to transition new concepts and technology for system development and deployment.

At Lincoln Lab, Work received updates on R&D focused on long-term technology development and rapid system prototyping and demonstration.

### **Speaking to Sailors**

Afterward, Work traveled to Bath, Me., to speak with sailors aboard the *USS Zumwalt*, a guided-missile destroyer with stealth capabilities built at Bath Iron Works. During his visit, the deputy secretary received briefings on technology, capabilities, and design.

At each location, Work met with service members and civilians to express his appreciation and that of Defense Secretary Ash Carter for their commitment and service.

### Initiatives to Improve Air Force Acquisition

66TH AIR BASE GROUP PUBLIC AFFAIRS (MAY 18, 2015)

Patty Welsh

LEXINGTON, Mass.—Addressing an audience of industry and government employees May 13, the Air Force's Service Acquisition Executive spoke about acquisition priorities, challenges, and initiatives.

Dr. William LaPlante, assistant secretary of the Air Force for acquisition, emphasized his top priorities: "big" projects, consisting of the F-35 Lightning II, the KC-46A Pegasus, and the Long-Range Strike Bomber; transparency and bending the cost curve; owning the technical baseline; Better Buying Power 3.0; and strategic agility.

The speech came during a visit to nearby Hanscom Air Force Base, Mass., which also included stops at MITRE Corp. and the Massachusetts Institute of Technology Lincoln Laboratory, where he attended the Air Vehicle Survivability Workshop.

Speaking on acquisition and transparency, he mentioned it's often hard to let go of preconceived notions. "The hardest thing is not to get new thoughts into people's minds, but to get old thoughts out," LaPlante said.

Two years into the job, he said people still think the Air Force takes fighter pilots and makes them program managers. However, the average acquisition career program manager has 19 years of experience and program executive officers usually even more.

In addition, cost and schedule overruns are often exaggerated. He said adjusting for inflation, overall program costs have declined for the past three years. Schedules are still a challenge for development programs, but that is often due to issues with software or systems engineering.

He mentioned Air Force Secretary Deborah Lee James and Air Force Chief of Staff Gen. Mark A. Welsh III bending the cost curve efforts to drive down weapons system costs. He also recognized the Air Force's efforts in working with industry organizations such as the National Defense Industrial Association, and the Armed Forces Communications and Electronics Association to look at small sets of projects and initiatives.

One effort is using other transactional authority (OTA), which allows flexibility in the contracting process, reducing the contract award time.

The Air Force will host PlugFest Plus June 8, at Joint Base Langley-Eustis, Va., using the Distributed Common Ground System, as an open systems architecture. Various information technology companies will work as a consortium to provide specific problem-solving regarding the system via the milCloud system at Hanscom. The upcoming event allows interested companies to "plug in" their systems into an open architecture, and demonstrate their best system applications. After using OTA, the goal will be to get the best options on contract within a week or two, allowing companies an opportunity to build prototypes.

"We're experimenting with these kinds of things because, as we set up the open architectures, we want quick ways to get people to bring their algorithm or application in and not wade through the laborious process," LaPlante said.

Throughout his presentation, LaPlante continually highlighted the necessity of open systems architecture and open mission systems. "If there's one thing you take away today, it's open systems," he said. "We're doing it—program by program."

Other initiatives address acquisition challenges, intellectual property, "out-of-the-box" experiments, and meaningful discussions during source selections and foreign military sales challenges.

LaPlante also addressed owning the technical baseline, recapturing what the Air Force used to do in the 1990s. It's government program offices, in conjunction with their teams including personnel from Federally Funded Research and Development Centers and contractor support, being smart buyers. The program offices should have the integrated master schedule, know the design of the system, and run performance models independent of the system.

When talking about complex systems, multiple places should look at performance, he said. Using the Joint Surveillance Target Attack Radar System (Joint STARS) recapitalization as an example, LaPlante said the program office should also understand how the system is working and being used today; items such as availability and operator complaints need to be understood as the program office works on the replacement.

Building to the future was something LaPlante focused on when addressing strategic agility. He said the Air Force is looking to reinvigorate developmental planning, and when that comes to acquisition, it means adaptability.

“You’ll have to plan for the fact that you will not know what our adversaries or technology will do,” he said. “And that the warfighter will find a way to use [the system] in a way you never thought of, so you need to build in open architectures and allow for pivot points.”

### **Work Highlights U.S. Military Technology Efforts**

*DoD News, Defense Media Activity (MAY 22, 2015)*

WASHINGTON—America’s defense companies and employees provide the capabilities, technologies, and services that underpin the nation’s global military power, Deputy Defense Secretary Bob Work told industry representatives, according to a DoD news release.

Work spoke at the Aerospace Industries Association’s 70th Annual Spring Board of Governors and Membership Meeting in Williamsburg, Virginia. The deputy defense secretary talked to roughly 160 defense industry representatives about U.S. technological superiority, partnerships, and budgetary challenges, according to the release.

### **Boosting Military Technological Superiority**

Work highlighted the Department’s ongoing efforts to reverse the erosion of U.S. military technological superiority, to include: the Defense Innovation Initiative, Third Offset Strategy, Long-Range Research & Development Planning Program, Better Buying Power 3.0, and Defense Innovation Unit Experimental, the release said.

He noted the importance of industry and how defense companies and employees provide the capabilities, technologies,

and services that underpin America’s global military power, according to the release.

Turning to the defense budget, the deputy defense secretary explained that a return to sequestration funding levels would be an unmitigated disaster and that lower funding levels are harmful to national security, the release said. The Department, Work said in the release, needs a long-term budget approach that dispels sequester, once and for all, and provides the Department flexibility in making needed cost saving reforms.

Work repeated Secretary of Defense Ash Carter’s criticism of the overseas contingency operations mechanism for circumventing spending caps as a “gimmick” that fails to resolve the funding crisis facing the Department, according to the release.

He asked industry to continue to work together, and with Congress, to address the negative effects of both sequestration and relying on an Overseas Contingency Operations mechanism to fund the base budget, the release said.

Work said the Department will get through this time of declining budgets and increased demands, according to the release, by working together with industry and keeping our minds on the men and women who serve.

The deputy defense secretary ended his remarks by thanking the defense industry for its contributions to national defense, the release said.