

Air Force Seeks Nominations for National Aerospace Awards

AIR FORCE PERSONNEL CENTER PUBLIC AFFAIRS (AUG. 2, 2016)

Kat Bailey

JOINT BASE SAN ANTONIO-RANDOLPH, Texas—Air Force officials are accepting nominations for the Air Force Association's 2017 National Aerospace Awards through **Jan. 6, 2017**.

The aerospace awards recognize the most outstanding contributions to national defense in the fields of science and engineering relating to aerospace activity, flight in the atmosphere or space, and arts and letters; and distinguishes those who've significantly exceeded standard performance.

All Air Force military members, Department of the Air Force civilians, and units or groups of individuals are eligible to apply; however, each major command, combatant command, field operating agency, or direct reporting unit may submit one nomination for each award.

Nominations should be based on contributions that occur from Jan. 1 to Dec. 31, 2016, and can include projects that were started more than a year ago, but were completed during the current calendar year.

Search for eligibility and application procedures on myPers with the keyword "Aerospace."

For more information about Air Force personnel programs, go to the myPers website at <http://www.af.mil>. Click on the Career Center link. Individuals who do not have a myPers account can request one by following the instructions on the Air Force Retirees Services website at <http://www.retirees.af.mil/>.

Three Teams Earn Prizes in DARPA Cyber Grand Challenge

DOD NEWS, DEFENSE MEDIA ACTIVITY (AUG. 6, 2016)

Cheryl Pellerin

LAS VEGAS—Three teams earned prize money in the Defense Advanced Research Projects Agency's Cyber Grand Challenge here yesterday, but all seven finalists received awards for their substantial contributions to creating the world's first autonomous bug-hunting machines.

After three years of research and development the teams, some with members from all over the world, cut the cords with their machines Aug. 4 and—the air gap between them complete—the cyber reasoning bots were on their own for the world's first all-machine hacking tournament.

Amongst themselves, the bots played capture the flag, a game usually played intensely by human hackers to find, diagnose, and fix software flaws in real time in a simulated adversarial environment.

In just over 8 hours of computation and 96 rounds of about 270 seconds each, the machines authored 421 replacement binaries, or new native code, that was more secure than the original. They also authored 650 unique proofs of vulnerability, or attempts to navigate the maze of inputs accepted by the software, and proved the software under analysis was vulnerable.

Redefining What's Possible

"Tonight, completely autonomous systems played in an expert contest. In 2013 no such system existed and tonight seven of them played at a very high level," DARPA CGC Program Manager Mike Walker said at a press briefing immediately after the challenge.

"There's a saying in the hacker community that 'zero day can happen to anybody.' What that means is that unknown flaws in software are a universal lock-pick for intruders," he said.



The team from ForAllSecure, a Pittsburgh-based company, was the first-place winner of the DARPA Cyber Grand Challenge Aug. 4 in Las Vegas. Their computer system is called Mayhem and the technology is the result of more than a decade of program analysis research at Carnegie Mellon University.

DoD photo

“Tonight we showed that machines can exist that can detect those lock-picks and respond immediately,” Walker added. “We have redefined what is possible and we did it in the course of hours with autonomous systems that we challenged the world to build.”

The first place team, to receive a cash prize of \$2 million, was ForAllSecure from Pittsburgh, a company founded by David Brumley, Thanassis Avgerinos, and Alex Rebert. The company, whose bot is called Mayhem, has grown to nine employees in Pittsburgh and the San Francisco Bay area. They say their technology is the result of more than a decade of program analysis research at Carnegie Mellon University. Xandra, a bot designed by team TECHx of Ithaca, New York, and Charlottesville, Virginia, is the second-place winner and will receive \$1 million. And Mechanical Phish, a bot designed by team Shellphish of Santa Barbara, California, will receive \$750,000 as third place winner.

Shall We Play A Game?

The CGC was co-located this year with DEF CON, the world’s largest hacker convention. Walker, himself a member of the

hacker community and a respected capture the flag player, spoke last year at DEF CON about the future all-machine capture-the-flag competition.

After Walker’s remarks, a DEF CON audience member challenged the CGC winner to play with the human experts at DEF CON’s 2016 capture the flag. Walker agreed to take the challenge to the finalists.

At the ceremony yesterday, after all the teams had received their awards, Walker invited the captain of the Legitimate Business Syndicate up to the stage.

“I just have one question for Mayhem,” he said. “Shall we play a game?”

It was the same question the War Operation Plan Response computer asked Mathew Broderick’s character, a young hacker, in the 1983 movie “War Games.”

On the stage in Las Vegas, ForAllSecure co-founder Rebert moved to the mic. “It’s on,” he said.

The multi-day challenge is now in progress, the first time a machine has had a seat at the table of a capture the flag hacking event, and the results will be in Aug. 7.

"We have no expectation that [Mayhem] is going to be able to compete with experts," Walker said. "It would be a bit like entering one of the first chess playing machines into a high-level chess tournament."

But, he said, "We are interested in what it will do in the first five minutes, in one of those places that only computers can go—high-speed reaction time. And hopefully it puts a good first foot forward for autonomy."

On The Horizon

Challenges like CGC aren't the right solution to every problem, Walker said, but they work when a technology is on the horizon, on the edge of feasibility, and needs integration among several cutting-edge technologies into a single prototype.

"With self-driving cars, I think you saw LIDAR, computer vision, machine learning, imaging, sensing, and onboard computing all fused into a prototype, and it's very difficult to know before a prototype exists what the correct prototyping approach is," Walker explained.

"That's kind of where we were with the idea of machines being able to do fundamental computer security tasks in 2013. All these technologies for studying programs—everything from formal methods and automated mathematics to search and Monte Carlo input-generation techniques like fuzzing, directed fuzzing, dynamic analysis, sandboxing, the healing of execution divergence—all these things were research papers [that] had been published that said we can automate this to better inform the analyst," he added.

All the chains of technology and capability ended at a person, Walker said, and the question at the center was, what if they didn't end at a person? What if they could be tied together, and what's the best way to do that?

When the CGC began taking shape in 2013, Walker sought participation from teams from all over the world. "I believe crowdsourcing was the right answer to that question, and that getting global innovation in on the problem helped us get a much better result today," he said.

Army's 'Mad Scientist' Initiative Looks at Future Differently

ARMY NEWS SERVICE (AUG. 9, 2016)

Gary Sheftick

WASHINGTON—The commander of the Army's Training and Doctrine Command, Gen. David G. Perkins, challenged military, industry, and academic leaders attending the Mad Scientist Conference at Georgetown University here to think differently about the future. The conference began Aug. 8 and ends today.

"There's a preoccupation with trying to predict the future," Perkins said. He challenged the attendees to describe the future—not predict it.

"That sounds like a nuance, but actually it's a significant nuance," Perkins said. He added that "describe" requires having a well-rounded understanding of the environment. It means understanding the changing variables and not "hardwiring" a solution.

Future Strategic Security Environment

The task these "mad scientists" are asked to perform is describe the strategic security environment in 2050. The Mad Scientist initiative is co-sponsored by the chief of staff of the Army's Strategic Studies Group, TRADOC, and the Georgetown University Center for Security Studies. It's an ongoing initiative of TRADOC's intelligence section, and this is the second year that a group has met in Georgetown.

Speakers this week include Chief of Staff of the Army Gen. Mark A. Milley, along with the director of the Australian War Research Center and representatives from universities across the country.

Perkins told the group that he's not looking for innovative ideas; what he wants is innovation—turning critical thinking "into valued outcome."

The Army has no lack of innovative thinking, he said, but because of bureaucracy and an all-or-nothing mentality, it's often difficult to follow through with those ideas. In business, many companies with innovative ideas have gone bankrupt, the general said, because they couldn't bring those ideas to market.

Collaboration

One of the things that characterize innovative companies is a high rate of collaboration, Perkins said. That, he said, is what the conference is all about.



A soldier assigned to 4th Squadron, 2nd Cavalry Regiment, fires a Javelin anti-tank missile at the Grafenwoehr Training Area, Germany, Feb. 24, 2016. The proliferation of anti-tank missiles, chemical-energy munitions, and shaped charges may put conventional armor at a disadvantage in the future, Army Gen. David G. Perkins, U.S. Army Training and Doctrine Command commander, said at the Mad Scientist Conference at Georgetown University in Washington, D.C., Aug. 8, 2016.

Army photo by Sgt. William A. Tanner

The military often has an “obsessive-compulsive nature to get everything digital,” he said.

“What happens is we miss opportunities to shape the future. We get consumed with responding to the future,” the general said.

A different way of approaching the future, he said, would be to ask the question, “What puts the U.S. Army at an advantage?”

Staying ‘Two Moves Ahead’

“We don’t do as good a job thinking two moves ahead—especially if we’re successful,” Perkins said about the military. He said success tends to “hardwire” a tactic or technique and make it permanent, but the enemy adapts.

For instance, Perkins said, the U.S. has the best targeting capabilities in the world. So enemies decide not to be a target. Therefore, he explained, the enemy today doesn’t wear uniforms or assemble in large formations—they blend in with the population and go underground.

Any technical innovation is only temporary, Perkins said. The enemy will soon adapt.

“Technology has become the most transferable of our capabilities,” said Perkins, noting that years ago, to steal a trade secret required taking blueprints and reams of documents.

“Now all you need is a thumb drive,” the general said.

As an armor officer, Perkins said he has long appreciated the protection afforded by the M1 Abrams tank and Bradley Fighting Vehicle. “I’m used to getting my protection from tons and tons of armor,” he said.

Protection for Combat Vehicles

Advanced protection for combat vehicles is one of the capabilities that TRADOC leaders believe will be critical in 2050.

“The problem we’re seeing now is, with the proliferation of [anti-tank guided missiles], chemical-energy munitions, shaped charges, etc., like that—is that the cost curve as well



INDIAN OCEAN (Oct. 16, 2015). The littoral combat ship *USS Fort Worth* (LCS 3) transits into formation during a photo exercise as a part of Exercise Malabar 2015. Malabar is a continuing series of complex, high-end warfighting exercises conducted to advance multi-national maritime relationships and mutual security.

U.S. Navy photo by Mass Communication Specialist 2nd Class Chris Brown

as the physics is working against us," Perkins said. "It's much easier to develop new ways to penetrate the armor."

To change penetrating charges is relatively inexpensive compared to producing new armored vehicles, he said. The adversary can update much quicker and with much less expense. The old paradigm of "more and more armor" may be outdated, he said.

"Better think of a different way to protect," he said. What's needed are capabilities, rather than things, he said, and challenged the group to avoid some of the "traps" that discussions of the future often fall into.

Archerfish Team Receives SECNAV's Safety Integration in Acquisition Award

PROGRAM EXECUTIVE OFFICE LITTORAL COMBAT SHIPS PUBLIC AFFAIRS (AUG. 12, 2016)

WASHINGTON—Members of Program Executive Office Littoral Combat Ships' (PEO LCS) Mine Warfare Program Office received the Secretary of the Navy's Safety Excellence Award for achievements with the Airborne Mine Neutralization System-Archerfish (AMNS-AF) safety team in a ceremony, Aug. 1.

Established to ensure overall safety of the MH-60S helicopter-borne AN/ASQ-235 mine neutralization system, the

Archerfish safety team completed critical qualification and performance test events in 2015 in support of the LCS Mine Countermeasure (MCM) Mission Package's Initial Operating Capability (IOC) achievement.

"The Archerfish Airborne Mine Neutralization System forms an integral part of the LCS Mine Countermeasures mission package; not only does it remove Sailors from the minefield, but it also speeds up the mine neutralization process," said Melissa Kirkendall, program manager for Mine Warfare Programs (PMS 495). "Since the Archerfish uses explosive destructors to neutralize mines, shipboard and aviation safety were absolutely critical to a deployable capability."

Designed to reacquire and identify moored and bottom sea mines and neutralize them, the Airborne Mine Neutralization System has become the Navy's standard for organic airborne mine clearance. It is a system that takes divers and explosive ordnance disposal teams out of the minefield.

Led by Assistant Program Manager Tracey Williams, the AMNS-AF safety team demonstrated success by identifying safety hazards and mitigating or eliminating those hazards throughout the program's life cycle, which included improvements to hardware safety, software and firmware safety, explosive safety, human-systems integration safety, prevention of inadvertent launch, and ordnance-handling safety.

Several innovative and original design decisions were implemented to ensure safety was embedded into the overall system, including:

- Multiple Safety Interlocks—The AMNS-AF safety interlocks have been implemented and tested with the safety of the system, operators, and integration platforms in mind.
- Safe and Arm System—Through teamwork and cooperation, the third tier supplier (e2v technologies) was included in the safety review boards, ensuring subject matter expert (SME) input was considered.
- Insensitive Munition (IM) Shield—Working with the SMEs, a shield was introduced into the container design to lower the reaction experienced during an IM event.

Along with complex integration of Archerfish aboard the MH-60S multi-mission helicopter, as well as within the LCS MCM mission package, the team worked with engineering and test and evaluation teams to ensure successful electrostatic, shock, and environmental certifications and incident-free completion of the mission package's technical evaluation.

LCS is a modular, reconfigurable ship, with three types of mission packages including surface warfare, mine countermeasures, and anti-submarine warfare. PEO LCS is responsible for delivering and sustaining littoral mission capabilities to the fleet. Delivering high-quality warfighting assets while balancing affordability and capability is key to supporting the nation's maritime strategy.

For more news from Naval Sea Systems Command, visit <http://www.navy.mil/local/navsea/>.

DoD Officials Observe Logistical Innovation Throughout II MEF

DEFENSE LOGISTICS AGENCY NEWS (AUG. 22, 2016)

Marine Sgt. Lucas Hopkins

MARINE CORPS BASE CAMP LEJEUNE, N.C.—Top officials from the Department of Defense observed demonstrations of new technological equipment Aug. 17.

Alan Estevez, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, Kristin French, Principal Deputy under Secretary of Defense for Logistics and Materiel Readiness, and U.S. Marine Corps Lt. Gen. Michael Dana, Deputy Commandant of Installations and Logistics, visited the USS Wright (T-AVB-3) and several units within 2nd Marine Logistics Group, gathering information and gaining an understanding of recent breakthroughs in logistical innovation.

"We are focused on providing Marines the finest support possible in garrison and in combat. To achieve that, we are very focused on innovation," said Dana.

The first demonstration aboard Camp Lejeune was given by Marines with Combat Logistics Regiment 25, displaying the Joint Tactical Aerial Resupply Vehicle.

"The JTARV is one of those pieces of technology we're hoping to leverage to support the warfighter, specifically as it relates to logistics resupply missions," said 1st Lt. James R. Van Eerden, the officer in charge of the JTARV project. "The idea was for them to see that we as a Marine Corps can leverage technology as a force multiplier."

During Operation Enduring Freedom, drone technology was used specifically for reconnaissance purposes. Now, the Marine Corps is collaborating with the U.S. Army to implement the JTARV for logistical purposes, while also considering the possibilities of incorporating it in other combat-related scenarios.

"The really unique selling point for the JTARV is that it could realistically be integrated across the [Marine Air-Ground Task Force]," said Van Eerden, also saying that with certain add-ons and modifications, the drone can be used to directly support air and ground forces.

The group then visited 2nd Maintenance Battalion, getting a first-hand look at current predictive maintenance, 3D printing and additive manufacturing capabilities. These processes can recreate small parts for vehicles and other equipment, which allows for faster reparations in garrison and on the battlefield.

"Technology is evolving at a dynamic pace, and we are doing our best to capitalize on the efficiencies and effectiveness that new technology can provide," said Dana.

Complementing the logistical displays was the caliber of performance demonstrated by junior Marines using the JTARV and 3D printing equipment.

"Individuals who have limited training and experience in the Marine Corps could use this technology that is a force multiplier in pretty simple ways," said Van Eerden.

"Their grasp of innovation and their knowledge of their jobs was outstanding by every measure," said Dana. "These Marines are focused on innovation and finding better ways of doing things [which] is exactly what we need to move forward with 21st century Marine Corps logistics."



Lt. Gen. Michael Dana, center-left, deputy commandant of Installations and Logistics, greets Col. Mathew Reuter, center, commanding officer of Combat Logistics Regiment 25, at Camp Lejeune, N.C., Aug. 17. Dana visited various units throughout II Marine Expeditionary Force to observe advancements in logistical technology.

U.S. Marine Corps photo by Sgt. Lucas Hopkins

Whether training for future contingencies or forward deployed in combat, Marines will continue developing new and more advanced technological capabilities to ensure success.

“Fortunately, there are many exciting opportunities available today to improve logistics support across the Marine Corps, and we are aggressively implementing,” said Dana. “The visit reinforced our efforts and future innovation projects throughout the Marine Corps.”

A-10 Team Garners 2015 Roche Sustainment Excellence Award

75TH AIR BASE WING PUBLIC AFFAIRS (AUG. 31, 2016)

HILL AIR FORCE BASE, Utah—The Air Force Life Cycle Management Center’s A-10 Division at Hill AFB, Utah, has been honored with the 2015 Dr. James G. Roche Sustainment Excellence Award.

Gen. Ellen M. Pawlikowski, Air Force Materiel Command commander, presented the award Aug. 31, to Dawn Sutton and the A-10 System Program Office during a meeting of AFMC leaders at Hill AFB. Sutton leads the team charged

with supporting the Air Force’s fleet of 283 A-10 Thunderbolt II close air support aircraft.

The award is presented annually based upon objective criteria to the AFMC program office with the most improved performance in fleet sustainment during the given fiscal year. Metrics evaluated include aircraft availability, mission capable and cannibalization rates, along with non-mission capable rates for supply and maintenance.

During Fiscal 2015, the A-10 fleet flew nearly 87,000 worldwide flying hours and delivered an aircraft availability rate of 67.9 percent, a 5 percent gain over the previous year. Sutton said the depot maintenance team reduced depot possessed aircraft to the lowest rate in a decade, and field maintenance personnel reduced the not mission capable for maintenance rate by nearly 20 percent to 13.9 percent. During the period, the team also reduced the cost per flying hour over \$2,000 to \$17,138, AFLCMC officials said.

The maintenance, repair, and operational improvements were noted to have taken place while executing A-10 combat operations against ISIL, as well as a short-notice Theater



The A-10 System Program Office team receives the 2015 Dr. James G. Roche Sustainment Excellence Award Aug. 31 during a meeting of AFMC leaders at Hill Air Force Base, Utah. The award is presented annually based upon objective criteria to the AFMC program office with the most improved performance in fleet sustainment during the given fiscal year, and is named after Dr. James Roche, a former U.S. Navy officer and the 20th Secretary of the Air Force.

U.S. Air Force photo/Todd Cromar

Support Package in support of Operation Atlantic Resolve to demonstrate U.S. resolve toward security and stability in Eastern Europe.

This fall, the venerable A-10 will celebrate nearly 41 years of service. The first production A-10A was delivered to the Davis-Monthan AFB, Arizona, in October 1975.

The award is named after Dr. James Roche, a former U.S. Navy officer and the 20th Secretary of the Air Force.

Brilliant at Any Age: ONR Researchers, Robots, and MIT

OFFICE OF NAVAL RESEARCH CORPORATE STRATEGIC COMMUNICATIONS (SEPT. 8, 2016)

Warren Duffie Jr.

ARLINGTON, Va.—Three researchers sponsored by the Office of Naval Research (ONR) are being recognized as outstanding innovators by the *MIT Technology Review*, which is published by the Massachusetts Institute of Technology to show how the world is being dramatically shaped by new technology.

The talented trio was included among the 2016 “35 Innovators Under 35” (LINK: <http://www.technologyreview.com/lists/innovators-under-35/2016/>) and “Seven over 70” (LINK: <http://www.technologyreview.com/s/602148/seven-over-70/>), which are annual lists spotlighting scientists, engineers, and inventors under the age of 35 and over 70, who are conducting groundbreaking research in various disciplines.

The awards span a diversity of fields—including robotics, biotechnology, materials, computer hardware, energy, transportation, communications, and the Web—and celebrate the development of new technology or the creative use of current technology to solve problems.

The honorees under 35 include:

- Dr. Nora Ayanian, assistant professor, University of Southern California. Ayanian is sponsored by ONR’s Science of Autonomy program. She studies how groups of people work together to complete large, complex tasks. Under her ONR effort, she has developed new approaches to support long-duration deployments of autonomous systems by

using robots that can share and deliver energy and other resources in the field.

- Dr. Sergey Levine, assistant professor, University of California, Berkeley. Levine is a 2016 winner of ONR's Young Investigator Program, a prestigious grant awarded to scientists and engineers with exceptional promise for producing creative, state-of-the-art research that appears likely to advance naval technology. Levine's breakthrough work in robotic manipulation and mobility falls within the scope of ONR's Human-Robot Interaction program.

The scientist showcased in the "Seven over 70" list is Dr. Ruzena Bajcsy, a professor at the University of California, Berkeley. Bajcsy is a pioneering roboticist whose research focuses on artificial intelligence, computational biology, and biosystems. She is sponsored by an ONR Multidisciplinary University Research Initiative studying how teams of humans and autonomous systems could one day work together. This includes new ways of supporting effective and safe interaction between people and autonomous vehicles, assistive devices, and robots.

"Seeing several ONR performers included in these prestigious lists is rewarding and exciting," said Marc Steinberg, an ONR program manager who oversees the research programs that sponsor Ayanian and Bajcsy. "Our performers are creating new opportunities for collaboration and dialogue, across disciplines and fields of study that may open up whole new research directions. This exchange of new ideas and innovations will ultimately benefit future sailors and Marines, who may find themselves working side by side with autonomous and robotic systems in ways we are only just starting to imagine."

Warren Duffie Jr. is a contractor for ONR Corporate Strategic Communications.

For more information, visit <http://www.navy.mil>.

DLA Looks to Commercial Industry For Innovative Solutions

DEFENSE LOGISTICS AGENCY NEWS (SEPT. 8, 2016)

Beth Reece

Counterfeit parts prevention and additive manufacturing are among numerous areas that need innovative solutions from commercial industry, Defense Logistics Agency's research and development chief said during the agency's first Research and Development Industry Day Sept. 7 at the McNamara Headquarters Complex.

"We're only touching the tip of the iceberg with respect to research and development. There are innovations out there

that you have that we may not even be aware of, but should be following. It might just be your innovation or new product that's a logistics solution for DLA," Kelly Morris told representatives from 14 companies.

The event familiarized industry representatives with DLA's strategic objectives and initiatives geared toward improving warfighter support and supply chain management. Attendees also learned about the Small Business Innovation Research and Small Business Technology Transfer programs, which enable small businesses to explore their technological potential and provide profit incentives.

Research and development efforts stretch across DLA's nine supply chains and involve distribution modernization, strategic materials, combat rations, and supply chain security. Casting and forging programs are in dire need of innovation, Morris said, because many of the parts on aging weapons systems are no longer available and businesses no longer manufacture them.

"Our casting and forging program is critically important because we've got to have sources of supply," she said.

The agency is also seeking advances in battery technology. Soldiers on deployment often must carry 20 to 30 pounds of batteries. Goals include extending battery lifespans, as well as reducing size and weight. Using lithium ion instead of nickel cadmium may also yield environmental benefits.

DLA is already working with the Navy and Air Force to accelerate additive manufacturing for parts that are hard to source or backordered, but wants to "move the needle forward." "We're now looking for ways to procure parts via 3D models using our existing DLA processes and manufacturing. We also want to move DLA from a PDF tech data package to 'smart' data and engineering models," Morris added.

Other areas industry can influence include the modernization of warehouses with robotics and automated ground vehicles, as well as counterfeit parts.

"We want parts that are trusted and true from original equipment manufacturers. It's not like walking around with a knock-off handbag," Morris said. "We need real parts that are going to last."

DLA is also looking for domestic sources for high modulus carbon fiber needed in airframes and the aerospace industry.

DLA's current annual budget for research and development is \$38 million. Morris said the amount is small compared



Collaborative Acquisition Equips Soldiers and Marines to Fight and Win

MARINE CORPS SYSTEMS COMMAND OFFICE OF PUBLIC AFFAIRS AND COMMUNICATION (SEPT. 13, 2016)

Mathuel Browne

MARINE CORPS BASE QUANTICO, Va.— In a series of ongoing efforts, Marine Corps Systems Command and the Army's Program Executive Office-Soldier are collaborating to develop, test, and deliver ever-better capabilities for Marines and soldiers. These acquisition professionals are also closely aligned to ensure uniforms and personal protective equipment properly fit female and male service members in order to accommodate every individual Marine and soldier.

The Cross-Service Warfighter Equipment Board and Improved Personal Protective Equipment System Integrated Product Team are just two of six established forums that give the Services an opportunity to share technologies and develop Service-specific and cooperative solutions to continuously improve equipment and uniforms for service members across all occupational specialties.

Kelly Morris, DLA's chief of research and development, describes opportunities for commercial industry to share relevant research and development ideas with DLA.

Photo by Teodora Mocanu

with the military services' budgets, but partnerships with industry can help make the most out of existing funds.

The event follows the DLA Land and Maritime Suppliers' Conference and Expo held in Columbus, Ohio, where Under Secretary Of Defense for Acquisition, Technology and Logistics Frank Kendall said the United States is quickly losing its technological superiority to adversaries. He stressed the need for DoD to start implementing new, innovative ideas. Innovation is a key tenet of Bettering Buying Power 3.0, the department's acquisition efficiency initiative.

Morris outlined four Broad Agency Announcements that solicit research proposals from private and public sectors.

"If you have a new innovation or something you're working on that could be a solution in the DoD environment, we could test that out," she said. "And if you have an innovation that doesn't fit one of those four areas, just let us know and we'll add it."

In addition to these formal venues, the Corps and Army are also constantly collaborating behind the scenes.

"While the Marine Corps and Army collaborate formally within CS-WEB and IPPES IPT, we continuously participate in each other's equipment testing exercises to collect and share research data," said Army Lt. Col. Kathy M. Brown, product manager for Soldier Protective Equipment at PEO-Soldier. "Through these formal and informal methods, we're able to share new technology and ideas to keep our service members equipped with the best gear."

Outcomes from Army/Marine Corps collaborative efforts span a spectrum of actions, including improvements for PPE, weight reduction, customization of uniforms and equipment to accommodate individual and unit missions, and organizational clothing and individual equipment development for extreme weather conditions.

One example of joint program success is the Enhanced Combat Helmet, fielded to both deploying Marines and soldiers. Manufactured with the latest lightweight material technology, the helmet provides improved ballistic protection against specific small arms and fragmentation.

“Providing effective equipment that meets the needs of our service members is our highest goal,” said Charles Bell, a retired Marine and acting product manager for MCSC’s Infantry Combat Equipment. “There is a genuine, concerted effort to collaborate and to partner in development, acquisition, and sustainment whenever we can.”

Cold weather clothing and equipment is another common cause. Developed by the Marine Corps and adopted by the Army, the Three Season Sleep System is designed for use in temperatures down to -13 degrees Fahrenheit in conjunction with designated cold weather clothing layers. Weighing less than two pounds, the sleeping gear is easy to pack, which allows service members to respond rapidly to changing field conditions.

“Adopting equipment between Services is done frequently as we are constantly looking for ways to satisfy Soldiers’ and Marines’ needs,” said Army Lt. Col John Bryan, product manager for Soldier Clothing and Individual Equipment at PEO-Soldier. “The Three Season Sleep System is just one example.”

Lighten the Load

Together, the Army and the Marine Corps continue to focus on lightening the load for soldiers and Marines, particularly when it comes to personal protective equipment. In 2010, the Marine Corps conducted a survey of Marines in conjunction with the Army’s Natick Soldier Research, Development and Engineering Center to assess sizing and weight of body armor and load-bearing equipment. As a result, the Services are partnering to develop the Plate Carrier Generation III (PC Gen III), a Service-common vest that will provide better fit, comfort, and mobility to Marines and soldiers. The new prototype reduces the length of the protective vest by 1.25 inches; provides sports-graded shoulder straps to improve fit; and is 25 percent lighter than previous models.

“Both the Army and the Marine Corps are actively engaged in researching and developing a next-generation personal protective equipment solution that reduces overall weight; and optimizes the elements of size, bulk, fit, and comfort to maximize mobility,” said Nick Pierce, the MCSC Team Leader for PPE, Load Bearing, and Pack Systems. “The outcome will accommodate the comprehensive anthropometric differences between small- and large-statured Marines and soldiers—male and female—so that both Services provide properly fitting PPE for the entire force.”

The PC Gen III is scheduled for multiple Limited User Evaluations during fiscal year 2017. Results will inform the requirements for the next-generation system.

Tropical Environments

The Services are working hand-in-hand to develop uniforms and boots for tropical environments. The result of that partnership was put to the test during August as the Marine Corps tests the prototypes during a LUE at the Jungle Warfare Training Center in Japan. The uniforms are made of lighter fabric and treated with permethrin to help repel insects. The boots were tested for improved moisture management and reduced drying time, without loss of durability or protection for the wearer.

The Army is also conducting user evaluations on its version of tropical weight materials and boots made for tropical environments.

“After each phase of tropical uniform evaluations with our soldiers, we send over our reports to the Marine acquisition team,” said Bryan. “If in the end the Army and the Marine Corps decide on the same items, great, but if information helps Marines find a better solution for their needs, that works too.”

Collaborative initiatives like this aim to ensure soldiers and Marines have the best products and capabilities to accomplish the mission. By engaging in a continuous free-flow of ideas, approaches, and materiel improvements, the Services ensure they are aligned to streamline the acquisition process, reduce costs, and provide common sustainment benefits. Ongoing pursuits and success stories of the Army and Marine Corps individual equipment partnership:

- Flame Resistant Uniforms and Materials
- Spectral Mitigation and Susceptibility Reduction of PPE and Uniforms
- Arctic Overwhites
- Protective Undergarments
- Enhanced Combat Vehicle Crewman’s Helmet
- Ballistic Base Layer/Combat Shirt
- Protective Eyewear
- ESAPI Ballistic Plates
- Extreme Cold Wx Boots
- Lightweight Exposure Suit
- Extreme Cold Wx Parka
- Windpro Fleece Jacket

“Anything we develop that the Services are able to share has a ripple effect in terms of efficiency and cost. If the Army and Marine Corps can be sustained by the Defense Logistics Agency for the same systems—with the same National Stock Numbers—the result is an economy of scale that both Services can leverage to reduce costs and simplify the acquisition and sustainment of multi-Service common clothing and equipment,” said Bell.



U.S. Army Cpl. Gregory McLellan and U.S. Marine Corps Cpl. Clinton Smith plot grid points during a joint training exercise at Arta, Djibouti. Through informal methods like training exercises, as well as formally established joint forums, the Services work together to share new technology and ideas to develop, test, and deliver ever-better capabilities for Marines and soldiers.

U.S. Air Force photo by Tech. Sgt. Dan DeCook

grounds, Craig Fields, the board's director, told DoD News in a recent interview.

The board includes retired senior DoD and intelligence community officials, senior executives in the defense industry, retired admirals and generals, and university professors from institutions such as the Massachusetts Institute of Technology, all working as unpaid volunteers, Fields said.

"Most of our work is in the form of studies that lead to recommendations about what to do for the defense secretary, the chairman of the Joint Chiefs of Staff, the deputy defense secretary, the vice chairman of the Joint Chiefs of Staff, and the under secretary for acquisition, technology and logistics," Field explained.

Among other things, Marine Corps Systems Command equips the Corps with the best available material solutions to meet validated requirements by developing, fielding, and sustaining infantry combat equipment to enhance the expeditionary readiness, performance, capability, survivability, and mobility of Marines.

PEO Soldier's mission is to develop, acquire, field, and sustain affordable integrated state-of-the-art equipment to improve soldier dominance in Army operations today and in the future.

DoD Leadership Commemorates 60 Years of Defense Science Board Counsel

DOD NEWS, DEFENSE MEDIA ACTIVITY (SEPT. 20, 2016)

Cheryl Pellerin

WASHINGTON—For 60 years, the Defense Department leadership has had wise counsel in its efforts to set a global pace in technology innovation and keep the world's best military force moving into the future.

Established in 1956, the Defense Science Board today has 48 civilian members with strong science and technology back-

Unearthing Opportunities

"What we do is try to tackle what we think, and what the secretary thinks, are the most unstructured, irksome, difficult, challenging problems that are important [and] consequential, or unearthing opportunities and trying to elaborate them and present them," Fields said. He noted that the board has spent a lot of time recently on cyber-related matters, with "a rich set of studies" recently completed or nearly complete.

A 2012 Defense Science Board study on cybersecurity made it clear that better work on cyber defense would help against low- and mid-level threats, Fields said. But defense would be inadequate against expert states posing high-level threats, he added, and deterrence would be needed.

A follow-on study that was recently completed addresses deterring the leadership of a foreign state from launching cyberattacks on the United States, Fields said.

The board also has recently completed studies on cyber corruption of the supply chain and cyber defense management, which Fields explained is about how to best manage

human and financial resources to get the best defense. “The members who did that came up with concrete suggestions of how we can do radically better within our resource constraints,” he said. “What’s nice is that I think those recommendations are being implemented before the report’s even printed.”

60th Anniversary Celebration

This year, the board decided to have a larger celebration than it had for its 40th and 50th anniversaries, Fields said. Today’s 60th anniversary observance includes presentations, panels, and demonstrations, and Carter will speak at tonight’s anniversary dinner.

Deputy Defense Secretary Bob Work and Air Force Gen. Paul J. Selva, vice chairman of the Joint Chiefs of Staff, will speak at the board’s event today.

“We wanted to look toward the future and to celebrate the hundreds of thousands of scientists and engineers who over those decades have contributed immensely to national security,” the director said, “so we decided to celebrate science and technology and contributing innovation to national security, rather than just focus on the board.”

Three panels will discuss what artificial intelligence, the new digital domain of espionage and warfare, and biology from discovery to national security mean for the Defense Department, Fields added, and a range of experts will make presentations.

Some of these include:

- “Materials by Design: 3-Dimensional Nano-Architected Metamaterials” by Professor Julia R. Greer of the California Institute of Technology;
- “Leveraging Biology for Persistent Undersea Sensing” by Professor John O. Dabiri of Stanford University;
- “Defense Applications of Synthetic Biology” by Christopher Voigt of MIT; and
- “The Flexible Networks of the Human Brain” by Danielle S. Bassett of the University of Pennsylvania.



Defense Secretary Ash Carter is given a demonstration of a cyber rifle designed to shoot down drones during his visit to the U.S. Military Academy in West Point, N. Y., March 23, 2016.

DoD photo by Petty Officer 1st Class Tim D. Godbee

Working with DoD

With its complete focus on science and technology, it’s no surprise that the Defense Science Board and the Defense Advanced Research Projects Agency have a close relationship, said Fields, who was the DARPA director from 1974 to 1990.

“Both organizations are dedicated to innovation, creativity and change, and not a lot of organizations are change agents,” he said, noting that the organizations have similar cultures.

“And at one time we had three or four former DARPA directors as DSB board members, ... so it’s a very close relationship, but it’s an informal one,” he added. “We often in our reports give recommendations to DARPA, and they often help us in getting the background we need to do our studies.” Fields said the military services have their own science and technology advisory boards, and that the DSB has good relations with those boards as well.

In response to a question about whether DoD readily accepts DSB recommendations or pushes back against them, Fields said, "The answer is all of the above."

He added, "The fact that we're making a recommendation for some people is a welcome thing, and for others is a less welcome thing, because they have to think about ... how does this complement what I'm doing, anyway? And sometimes the jump-up is immediate, and sometimes it's five or 10 years later and there's no credit whatsoever to having been inspired by a DSB report. So there's a wide range of possibilities."

One extreme is a 2004 Defense Science Board study on stabilization and reconstruction during the early days of the Iraq War, Fields said. The defense secretary at the time wanted to know how DoD could do better in the future, he added, and when the study came out, the secretary signed a directive to implement all the recommendations.

"At other times, it's more delayed," Fields said. "So some things work sooner, some work later, some honestly work never, because nothing's perfect."

Transcom Releases Forward-Looking Strategy for Future Success

U.S. TRANSPORTATION COMMAND NEWS RELEASE (SEPT. 23, 2016)

SCOTT AIR FORCE BASE, Ill.—U.S. Transportation Command has released a new strategy designed to help the command navigate the uncertain future it faces, Transcom officials said.

The intent, officials added, is to ensure Transcom remains a world-class organization always capable of answering the nation's call.

"In the coming years, we should expect conflicts to cross regional boundaries and potential adversaries to field numerically superior forces with near technological parity," Air Force Gen. Darren W. McDew, Transcom's commander, said in the document.

Outlining Steps to Achieve Priorities

The framework outlines the steps the command will take to achieve its priorities, which McDew announced in January to help the command prepare to tackle tomorrow's challenges, officials said. They are:

- Ensure today's readiness and advocate for tomorrow's capabilities;
- Advance cyber domain capabilities;
- Evolve for tomorrow; and

- Champion an innovative, diverse, and agile workforce.

Combined, officials said, the priorities provide the vision for a future command that is better able to anticipate change, leverage new technology to increase effectiveness and efficiency, quickly and easily adapt to new realities, and respond to cyber threats with resilience.

"We must be ready to execute in contested environments while advocating for tomorrow's capabilities, extend mission assurance through the cyber domain, evolve the command to ensure agility and responsiveness in the dynamic environment of tomorrow, and address the fundamental changes occurring in our nation's workforce," McDew said.

Innovation, Agility, Bold Ideas

While the strategy incorporates the ways and means for reaching the desired end-state outlined by the priorities, Transcom officials said, it also stresses the need for innovative thinking, agility, and bold new ideas from the entire workforce. In fact, they added, when McDew presented the new strategy to the command, he charged the workforce to take positive action to address the challenges they face.

"This is a living document as the strategic environment demands flexibility in our collective efforts," McDew said. "While the command strategy provides my overarching guidance, every [command] member must interpret the concepts and apply them with their own initiative. You are empowered."

309th EMXG Receives First Annual DOD VPP Award

OGDEN AIR LOGISTICS COMPLEX (SEPT. 29, 2016)

Alex R. Lloyd

HILL AIR FORCE BASE, Utah—Lots of firsts are happening at Hill Air Force Base, Utah, in 2016 and it has happened again. The Ogden Air Logistics Complex's 309th Electronics Maintenance Group has come away with the first-ever 2016 Department of Defense Voluntary Protection Program Group Achievement Award.

The award is to encourage a continuous positive safety culture change and to recognize the hard work of the DoD installations and individuals committed to VPP.

"I am very proud of the 309 EMXG team," stated Brig. Gen. Steven J. Bleymaier, Ogden Air Logistics Complex commander. "A safety first culture requires engagement, communication, teamwork, and action at all levels by every member on the team; and that's what EMXG has—there are no bystanders, they're all on the first string and making a difference."



Representatives from the Ogden Air Logistics Complex accept the 2016 Department of Defense Voluntary Protection Program Group Achievement Award during the National Voluntary Protection Programs Participants' Association conference in Kissimmee, Florida. From the left are: William Hood, OO-ALC VPP Program Manager; Vance Lineberger, AFMC HQ/Safety; Len Litton, Director, Personnel Risk Reduction; Brig. Gen. Steven Bleymaier, Commander, Ogden Air Logistics Complex; Sandra Fitzgerald, Director, 309th Electronics Maintenance Group; Laura Haislip, 309th Electronics Maintenance Group Union Steward/Employee; Maureen Sullivan, Deputy Assistant Secretary of Defense, Environment, Safety and Occupational Health; and Joseph Blue, OO-ALC Union Safety/VPP Representative.

Photo by Craig Huey

Encompassing a highly skilled workforce over 700 members strong, EMXG is the complex's global electronics center of excellence, which safely provides repair; overhaul; and modification of electronics, avionics, radar, navigation systems, laser guidance systems, instruments, photonics, generators, electrical systems, and components on 12 vastly different weapon systems.

The group's workload is handled by four squadrons and three support sections, and ranges from small benchtop repair of aircraft electrical components to heavy industrial maintenance on various ground power generator support equipment units.

Daily performance of their duties exposes employees to various hazards that include chemicals, heavy lifting, electrical shock, slips and falls, and expanded hazards caused by the presence of heavy metals.

With their daily exposure to hazards, EMXG has forged an attitude of safety throughout the organization, which has resulted in injuries dropping from 34 in 2011 to 1 in 2015.

This attitude, along with many months of hard work and practical application, has resulted in EMXG being the only Occupational Safety and Health Administration VPP STAR site at Hill Air Force Base, as well as the first DoD installation

to do so in OSHA Region 8, which includes North and South Dakota, Montana, Idaho, Colorado, Wyoming, and Utah.

Sandra Fitzgerald, Director, 309 EMXG, was presented the award Aug. 29 by Maureen Sullivan, Deputy Assistant Secretary of Defense for Environment, Safety and Occupational Health, during the Voluntary Protection Programs Participants' Association National Conference.

"EMXG truly stood out amongst its peers," said Fitzgerald, "with a solid safety culture built on teamwork, communication, respect, accountability, engagement and transparency between employees, management, and union leadership."

Earning the achievement award has truly been a complete team effort. It starts with group leadership being committed to building a strong VPP culture by providing resources and manpower, supervisors declaring their specific work centers a safe site, and employees volunteering as VPP safe site representatives. Together it ensures safety and health is a critical part of daily activities.

"This recognition is a significant accomplishment and highlights our efforts in setting the highest standard of safety and occupational health for all organizations, and demonstrates the exceptional commitment to protecting the safety and health of each other. EMXG is making a difference," said Fitzgerald.