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MODERNIZATION & ENTERPRISE COLLABORATION

FINDING COMMON GROUND

Brig. Gen. Garrick Harmon shares his insights on enterprise collaboration

FEEDBACK LOOP

Early Soldier input improves Army aviation modernization

STITCHING THE ARMY'S DATA FABRIC

The Army is enabling better decision-making with 'data fabric'

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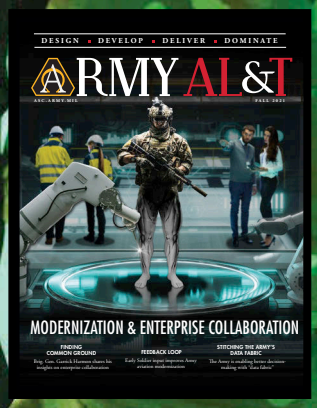
ARMY AL&T

FALL 2021

FROM THE AAE

MODERNIZATION AND ENTERPRISE COLLABORATION



ON THE COVER

Modernization and enterprise collaboration—how is the Army working with its partners in industry, academia and the federal government to create tomorrow's fighting force? How can the acquisition enterprise adapt to the changing environment, as speed becomes increasingly important? In the words of the acting Army Acquisition Executive, Douglas R. Bush, "We as an organization have to find responsible ways to do things more quickly."

DESIGN ▪ DEVELOP ▪ DELIVER ▪ DOMINATE

ARMY AL&T

FALL 2021

From the Editor-in-Chief

As Forrest Gump might say, "Modernization and enterprise collaboration go together like peas and carrots!" It's a symbiotic relationship that encourages innovation, continuous process improvement and, most critically, teamwork. Working collaboratively with our industry partners toward a common goal provides access to greater resources, innovation, rewards and results. Working collaboratively with industry is Army acquisition.

The ubiquitous smartphone, for example, is not just one person's eureka moment, but the collaboration of thousands of people and dozens of countries working together, improving on each other's work and delivering a state-of-the-art product. NASA's recent collaboration with commercial space companies is accelerating development and reducing space exploration timelines from decades to years.

And so it is with defense. America's military-industrial complex refers to a close and cooperative relationship among the nation's armed forces, its private industry and associated political interests. Consequently, the military is dependent on industry to supply material, innovation and other support, while the defense industry depends on government for requirements, oversight and revenue.

This issue of Army AL&T speaks directly to what everyone within the Army acquisition enterprise is doing right this minute, and has been doing for generations—retaining and enhancing overmatch, and creating the future of defense, not reacting to it. Just as the recent Olympics showed yet again, it's really difficult to stay on top of your game year after year. But the Army's acquisition enterprise has done just that again and again with amazing results.

For a glimpse at how the Army is modernizing and collaborating, take a look at how Army Futures Command's Future Vertical Lift Cross-Functional Team is using early input from Soldiers during system development to inform capability requirements and improve Army aviation modernization in "Feedback Loop" (Page 21). "One Munition, Multiple Targets" (Page 61) shows how the next-generation shoulder-launched munition, under development by Project Manager Close Combat Systems, will be based on existing technology improved with new ideas. The XM919 Individual Assault Munition will be lighter, able to be fired from within an enclosure, and capable of engaging targets from protected positions without being exposed to enemy fires and effects.

Email Nelson McCouch III
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However, no discussion of modernization and collaboration would be complete without talking about data. To that end, this issue showcases several articles where the Army is using and manipulating data to achieve a better Army:

- See how the U.S. Army Medical Research and Development Command is researching the intersection of humans, data and technology across the military health system in "The Blueprint" (Page 8).
- Or how the Program Executive Office for Command, Control, Communications – Tactical is creating a digital "fabric" from a variety of information sources to support functions like logistics or aviation in "Stitching the Army's Data Fabric" (Page 14).
- Finally, learn how the Army's Office of the Chief Information Officer is taking a holistic approach to data in developing a strategic direction toward a lethal, ready and digital Army of 2028 in "The Digital Army of the Future" (Page 30).

As always, if you have comments, concerns or critiques—or an idea for an article or even an actual article—please contact us at **armyalt@mail.mil**. We look forward to hearing from you.

Nelson McCouch III
Editor-in-Chief

THE ARMY TEAM

Teamwork is the key to success for Army acquisition, and it is incumbent upon leaders to support workforce members and use the talents of the workforce to the fullest. (Photo by Spc. Jessica Scott, 25th Infantry Division)

LET'S GET TO WORK

Focusing on getting existing programs right, finding ways to move faster are top priorities.

Since becoming the acting Assistant Secretary of the Army for Acquisition, Logistics and Technology, I've often been asked what my priorities are. Until now, I've held off on answering that question because I wanted to take the time to better understand the acquisition enterprise and how it fits into both the Army's and DOD's priorities. Now, after about seven months in this role, I wanted to convey a few thoughts.

My first priority is to focus on effective and successful execution of the many programs we have underway. In the last few years, I have seen the Army embark on a large number of new modernization initiatives and programs. Many of these use new authorities, such as rapid prototyping or rapid fielding, in new ways. Others are using new contract approaches, such as other-transaction authority (OTA) agreements.

In addition, of course, many are also using more traditional approaches to developing and fielding new capabilities for our Army. I also know that significant organizational changes have taken place, along with implementing new acquisition policies and practices.

GETTING IT RIGHT

Given all that "churn," I am focused—and would like the whole team focused—on getting these efforts right, rather than pushing major new

WITH A QUICKNESS

The Army has embarked on many new modernization initiatives and programs in recent years, often using rapid prototyping and rapid fielding in new ways. The Robotic Combat Vehicle–Medium underwent testing June 30 at Fort Dix, New Jersey, in advance of the 2022 Soldier Operational Experiment at Fort Hood, Texas. (Photo by Angelique Smythe, Picatinny Arsenal)

initiatives or making dramatic changes in approach. We have an enormous pool of talent across the acquisition enterprise. It's incumbent on all of us, and especially leaders, to use the talented workforce we are privileged to work with to keep programs on track and on budget. I am confident that we have the right workforce to get this done for the Army. When programs need adjustment, we should be open and honest with ourselves and others in the Army about what changes we need to make to get them back on track. Such teamwork within and across the Army will get the job done, and you have my commitment to back you up when changes are needed in order to get something right for the Army.

A second priority I would mention is finding ways to do things more rapidly than in the past, while ensuring we stay within the boundaries set for us in law, regulation and policy. The message I get from Army leadership, DOD leadership and many in Congress is that the threats we face require us to find ways to provide improved capabilities to the Army at a rapid pace. Based on this, we as an organization have to find responsible ways to do things more quickly. Critically, once

the Army's requirements process determines an acquisition program is needed to achieve a requirement, I want us postured to move as quickly as possible to carry out the program.

PAST SUCCESS

I am confident that achieving greater speed in a responsible manner is possible because I have seen it done in the past. Army acquisition has shown that it can deliver at high speed in emergency situations, such as meeting urgent combat needs and the COVID-19 pandemic. Even outside of a crisis of some kind, we have been able to move programs along through the acquisition process quickly. In my short time in this position I have encountered a lot of creativity and new ideas on achieving greater speed, which has been great to see.

I want to see, from all of us, an openness to doing things in new ways that can save time while not creating excessive risk. Note that I did not say "no risk." All programs have risks. I want to see everyone, from top to bottom, make an effort to understand risks and work on ways to mitigate them as best we can. That approach ensures that, when something does go wrong because we are trying to move more quickly, we are better positioned to figure out how to make whatever adjustments we need to make—all while still getting the job done faster than if we'd followed a "zero risk" approach. Again, if mistakes are made in a good faith effort to do things in new and innovative ways, you will have my support.

CONCLUSION

Thank you all for everything you do for your Army and the country. Army acquisition has achieved amazing feats in the past and I am honored to get the opportunity to lead this organization as it continues to do great work every day.

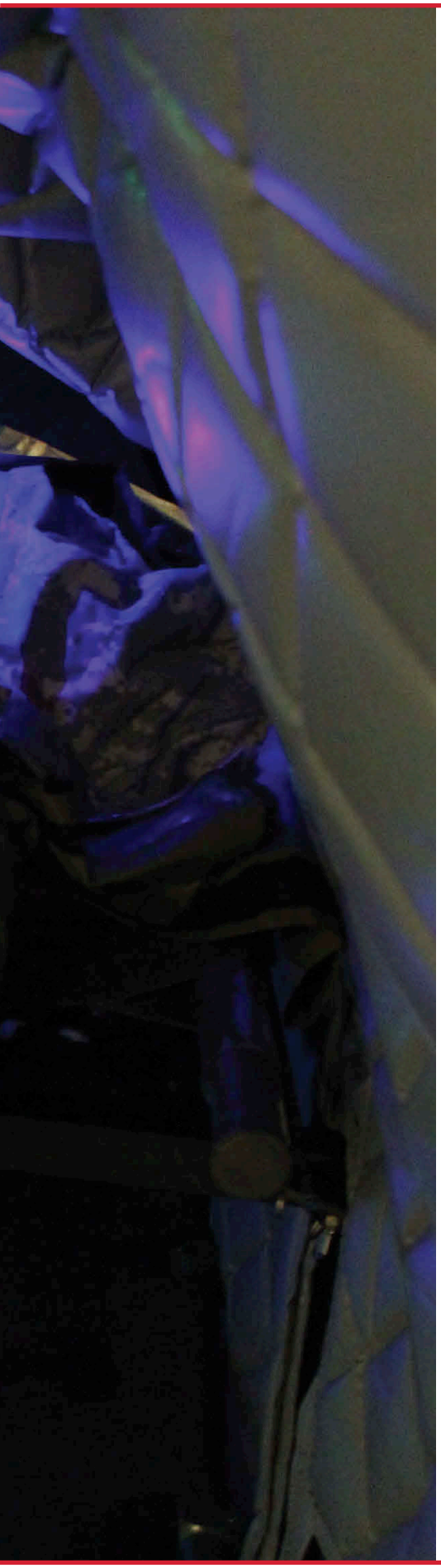
PANDEMIC RESPONSE

The Army acquisition enterprise can deliver at high speeds in emergency situations, as proven by the rapid response to the COVID-19 pandemic. (Photo by Cpl. Isaiah Matthews, Georgia National Guard)

EFFECTIVE AND SUCCESSFUL EXECUTION

Spc. Daniel Cameron looks out from his High Mobility Artillery Rocket System during Redleg Tempest II on Aug. 10 in Jordan. (Photo by Sgt. Kyle Burks, 1-181 Field Artillery Regiment)

VIGILANT
A Soldier monitors the health of a "casualty" inside a model of an unmanned vehicle during a tour of the TATRC NEXUS laboratory on May 25. (Photos by the author)



THE BLUEPRINT

NEXUS laboratory charts the future of medical performance.

by Ramin A. Khalili

It starts with chaos and so everyone acts accordingly. The Soldier picks up his radio and calls for air support—then motions to a buddy, who helps him carry an injured squad member about 50 yards away, setting up shop behind a barely-there wall of concrete blocks. There's yelling, of course—more like screaming, constant motion. Another Soldier runs over to help and now all three are busy administering combat casualty care to the person laying on the ground between them.

Standing just a few feet away, monitoring the action via computer, is Geoffrey Miller, who serves as the division chief of the Medical Modeling, Simulation, Informatics and Visualization program at the U.S. Army Medical Research and Development Command's (USMRDC) Telemedicine and Advanced Technology Research Center (TATRC). Just as the action hits a crescendo, Miller turns to a nearby crowd and says, "What we're really trying to understand here is what kind of data matters in any given situation."

"Any questions?" he says casually.

If you haven't guessed by now, the Soldiers described here are engaged in a training scenario. Their efforts, and the entire simulation taking place in the TATRC parking lot on this sunny morning in late May—from the medical equipment in the nearby tents to the scientists wearing motion-capture suits in the foam-padded studio just yards away—is part of a planned tour of USAMRDC's new NEXUS laboratory. The lab is a next-generation research environment designed to explore and analyze the intersection of humans, data and technology across the Military Health System. But it's the end result of all that data collection—the overall impact that this newly christened laboratory can truly, ultimately provide—that has heads turning at USAMRDC and beyond.

THE RIGHT DATA

The NEXUS laboratory is, as the name surely implies, a sleek and high-tech medical performance measurement laboratory; one that ultimately seeks to record military medical professionals as they perform various medical tasks (both with and without certain medical devices and technologies) in order to better understand human clinical procedural performance. The ultimate goal is then the codification of that performance.

"We like to talk a lot about the reliability of data, but I like to talk about the feasibility and practicality of data, too," said Miller, who began his career as a paramedic—logging 31 years on the job, in fact—before stepping into his current role at USAMRDC. "What's the right piece of data at the right time that's going to help make the right decision?"

If that's the question, then the NEXUS laboratory is primed to find an answer. It combines such cutting-edge tools as volume capture technology (a technique that digitizes three-dimensional spaces), psychophysiological monitoring (including sensors to document skin sweating and blood pressure), and electromagnetic motion tracking (a technology that allows human movement to be followed, gathered and processed), among others, to develop a so-called "master model of performance" as it pertains to any given medical procedure. Miller likes to call this "finding out what 'right' looks like." Once that baseline is achieved, the plan is to then train current and future medical professionals off of that new, master standard.

"Everybody's heard the old adage [that] practice makes perfect, but that's 100 percent not true," said Miller. "Practice makes permanent, because if your practice is imperfect, you will be permanently imperfect."

10 PERCENT

The NEXUS laboratory hopes to shore up those imperfections in a number of ways, chiefly by employing its capabilities to monitor both the physical and psychological efforts of its participants—including medics and other military medical personnel—performing various tasks related to combat casualty care. By monitoring physiological responses such as heart rate, blood pressure, respiration and electrodermal activity (i.e., sweat production) to a range of efforts—anything from establishing an airway to applying a tourniquet—researchers can then quantify and describe actions in which those aforementioned "master performers" excel. Conversely, they can quantify those actions in which novice performers do not excel. Additionally, by using an electroencephalogram, or EEG, to measure the electrical activity of the brain during a given task, researchers can objectively measure the cognitive load of said task on any participant; information that could, in turn, allow researchers to pinpoint when a particular Soldier is experiencing heavier stress and, additionally, which specific tasks caused that stress.

DATA STAR

Geoffrey Miller, division chief for the Medical Modeling, Simulation, Informatics and Visualization program at TATRC, speaks to a group of Soldiers and scientists during a tour of the NEXUS laboratory on May 25. Miller wants to provide everyone with the expertise they need through the science of data.

Further, and as a more specific example, the laboratory's motion capture system allows researchers to begin the process of finding answers to how, exactly, medical professionals must position their owns bodies to perform a particular procedure—everything from intubation to performing chest compressions—at an expert level.

"How someone lays out their equipment to prepare for a surgery or a procedure may be significant, or it may not matter, but we don't know until we explore that, until we measure it," said Miller.

"We've modeled what 'expert' looks like, so now let's give that expertise to everybody."

DIGITAL MEDICINE
A Soldier relays information via a cellphone during an exercise on the TATRC grounds, to highlight the capabilities of the NEXUS laboratory on May 25.

For instance, if 50 percent of medics always put their instruments in a certain order for a certain procedure, and those medics are then able to perform that procedure with a 10 percent better efficiency than the medics who put their instruments in a different order—does that 10 percent time savings ultimately impact the casualty? For Miller and the team at TATRC, we simply won't know unless we record the data and crunch the numbers.

According to Miller, "These are the questions we're hoping to explore and understand, because if we realize we got 100 percent of people to save that 10 percent, then it could make care 10 percent better in the long run."

In short, Miller said, the ultimate goal of collecting such voluminous data is for the expertise to be transferred from a single person (or a single "master performer") to the modeling itself, which can then be inserted into other computer-based systems to allow any student to practice independently with expert feedback, guidance and assessment.

These capabilities are in turn important to the larger Army modernization strategy as both the Army and DOD begin to capture, process and apply that collected data for the purposes of accomplishing overmatch on the multidomain battlefield. According to military experts, future adversaries will likely have spent years studying previous U.S. military processes and procedures—or, more specifically, how exactly the U.S. military approaches and engages in combat.

In the face of this likely reality, the NEXUS laboratory positions itself as

MEDIC!
NEXUS laboratory researchers monitor Soldiers as they carry a wounded "casualty" to a new location on the TATRC grounds during an exercise on May 25.

CAPTURED ACTION REVIEW
A Soldier wearing a motion capture suit surveys data in the NEXUS laboratory after the screen recorded his movements.

integral to the overall USAMRDC and DOD missions, as maximizing Soldier readiness—in this case, via data collection—may ultimately translate to increased Soldier lethality.

"Our intent here is to take all the data we're collecting and whittle it down to the data that's going to help the caregiver," said Col. Jeremy Pamplin, the director at TATRC, commenting on the laboratory and its capabilities. "If we can figure out the best technique as supported by data, regardless of what the prevailing opinion is, then we can take that information to the [Food and Drug Administration], to our partners in industry."

In a quip that essentially sums up the entire purpose of the NEXUS laboratory, Miller said, "Basically we've democratized expertise for any trainee, anywhere."

TWIN PILLARS OF THE FUTURE

Given the outsize role technology will likely play on the future battlefield, and perhaps reflecting the outsize role it plays in all our daily lives, the NEXUS laboratory is further designed to test human interaction with modern medical technology. This may reveal whether such tools truly benefit the caregiver and, in turn, the person receiving care.

"What we're doing here is testing these technologies in actual environments that simulate what Soldiers would see on the battlefield," said Nate Fisher, chief of TATRC's Medical Robotics and Autonomous System Division.

As part of the focus on the multidomain battlefield of the future, recent military medical research efforts have focused almost exclusively on two areas: making key tools and technologies smaller and studier, and finding ways to employ the substantial gains being made in the field of artificial intelligence. The NEXUS laboratory team hopes to put both of those efforts under the microscope. From the perspective of the team at TATRC, efforts to study these emerging technologies in such a unique setting will eventually allow researchers to more quickly identify the products likely to help caregivers complete their mission—a factor of chief importance when faced with the constraints of austere and operational environments. As a result, the NEXUS laboratory offers the ability to inform the development of better tools and technologies at a much faster rate than the current research and development process.

"We come here, we push [the product] to the point of failure, then figure out how we can make it better," said Miller. "And so,

when it comes to project convergence, we now have a more mature product to test in the larger medical battlefield ecosystem."

CONCLUSION

In moments of candor—and perhaps as a means to simplify the complexities behind such vast data collection—Miller is keen to compare the mission of the NEXUS laboratory to something far more familiar: the game of baseball. Baseball teams and their respective scouts have been gathering data on chosen prospects for decades, calculating everything from the speed at which a player swings a bat to how much energy a player exerts when stealing a base. And still, while baseball has yet to find a find a way to use that data to create the perfect ballplayer—the player who can approach each challenge in the most precise and efficient way possible—Miller believes the NEXUS laboratory may be able to do just that when it comes to teaching future generations of caregivers.

"We've modeled what 'expert' looks like," said Miller, "so now let's give that expertise to everybody."

For more information about USAMRDC, go to ***https://mrdc.amedd.army.mil/****; for more information about TATRC, go to* ***https://www.tatrc.org****.*

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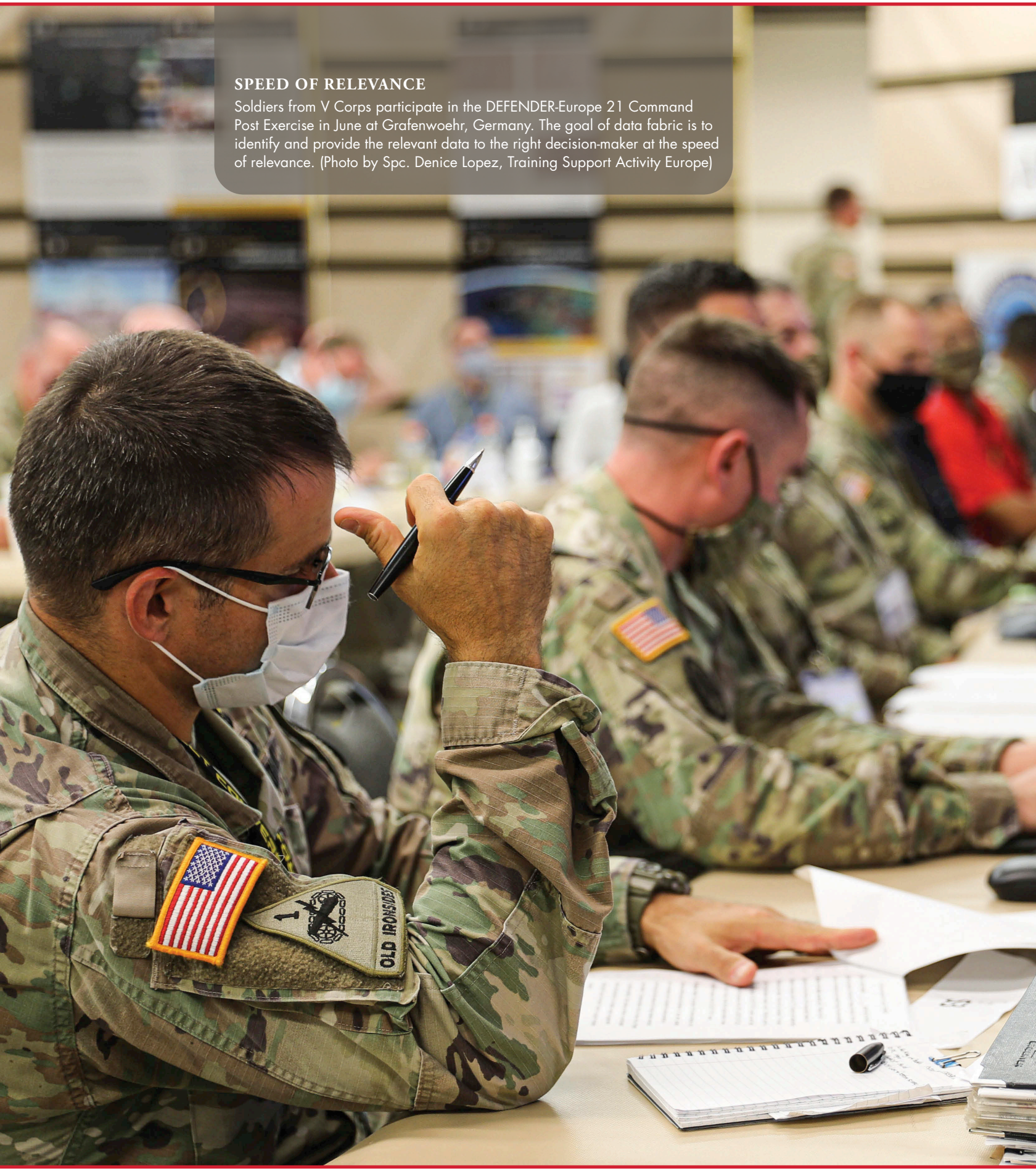
ROUTINE CARE

Two Soldiers perform routine medical care on a mannequin in the NEXUS laboratory's motion capture studio while their actions are recorded using cameras and sensors.

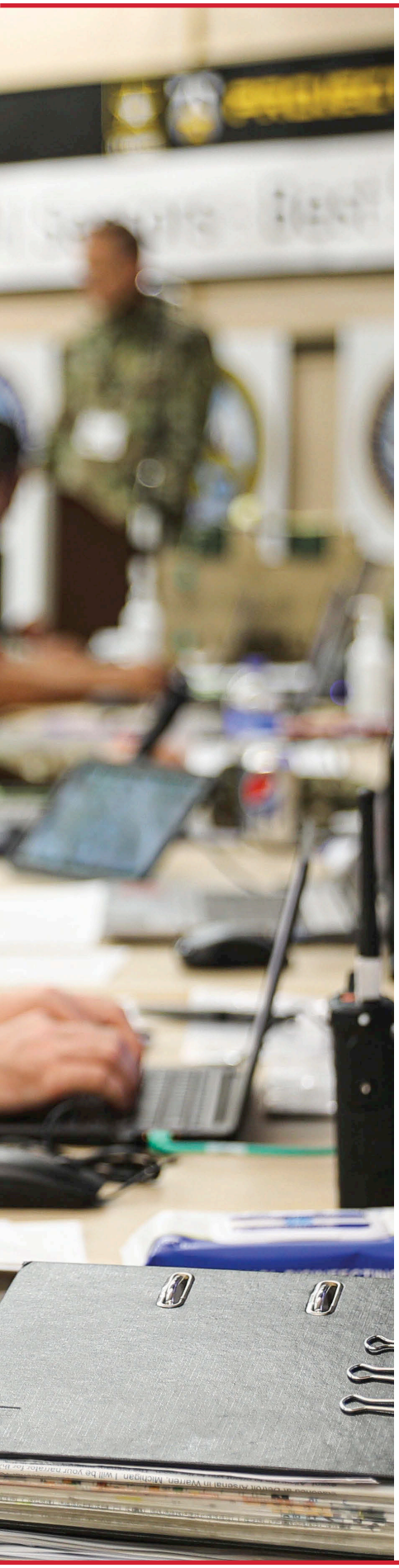
REMOTE INSTRUCTION

A NEXUS laboratory tour participant, left, completes a complex surgical task while a scientist instructs him on how to perform said task from another room while wearing virtual reality goggles.



SPEED OF RELEVANCE

Soldiers from V Corps participate in the DEFENDER-Europe 21 Command Post Exercise in June at Grafenwoehr, Germany. The goal of data fabric is to identify and provide the relevant data to the right decision-maker at the speed of relevance. (Photo by Spc. Denice Lopez, Training Support Activity Europe)



STITCHING THE ARMY'S DATA FABRIC

The Army is bringing together many sources of data to enable better decision making with 'data fabric.'

by Nihar Patel, Upesh Patel, Col. Evert R. Hawk II and Krupal Kapadia

For a battlefield commander making a pivotal decision, too much data can be just as bad as too little. Reports, imagery, raw message traffic and other content arrive via different applications and compete for attention. Meanwhile, the information the decision-maker really needs may be buried deep in another digital file, yet to be discovered.

Finding the balance—harnessing and providing the relevant data at the right moment—is the driving force behind the Army's work with data fabric. As the name implies, data fabric technology "stitches" together a variety of information sources and unique data formats, ranging from modern sensor arrays to legacy systems designed for specific functions like logistics or aviation. It overlays them with common interfaces and services using open standards so the systems can share information without custom translators. In doing so, the fabric creates a larger pool of data that is more enriched, synchronized and transparent, and routes the right data to the operator who needs it.

As Army senior leaders and operational commanders increasingly emphasize data as a strategic asset, it is clear that accessing, managing and protecting data will be key to achieving the Army's modernization priorities. Implementing a tactical data fabric is foundational to these efforts—and to realizing the vision of Joint All-Domain Command and Control (JADC2), the DOD-wide effort to integrate sensors, shooters and command-and-control nodes for resilient, adaptable communications across the joint services. For JADC2 to achieve this potential, usable data must flow quickly and accurately through the data infrastructures used by the Army and the joint services.

To reach that future objective state, the Army is following an incremental approach to deliver data fabric capability over time through the network capability set construct. Working across the Army modernization enterprise, and in collaboration with our joint service and industry partners, the Army has matured its own tactical data fabric and is now experimenting with additional commercial capabilities, with the goal of initial fielding in fiscal year 2023.

THE WHY AND WHAT

Access to the right information at the right time is a critical element to achieving future battlefield advantage at the operational and tactical levels. Timely access to data depends on agility in how data is managed. As Chief of Staff of the Army Gen. James McConville put it, "We've got to be able to move data machine to machine very, very quickly. That is the secret if you want to get to speed, range and convergence."

To achieve that goal, there are several challenges the Army needs to overcome. First, data in warfighting functional systems (such as fires, maneuver or sustainment) is often stovepiped or isolated, which can result in inconsistent and missing data in the common operational picture. When data is exchanged between warfighting function systems, it is frequently compressed due to message exchange formats, and it loses some of the information from the original source. Additionally, data is unnecessarily restricted from potential consumers when systems inherit the classification of the network they reside on, rather than managing the classification of the data itself. Finally, artificial intelligence (AI) capabilities—a necessity in order to operate at the speed of digital war—are starved for data, because warfighting systems generate information at high volume but without great value, as much of the collected data remains unprocessed and difficult to find, unbeknownst to the operator.

These technical challenges, coupled with the rising number of data sources available to operators, underscores the need for autonomous, flexible data integration capabilities that harvest and deliver the required data when needed. Data fabric provides that common layer to enable data discovery, synchronization and security across multiple silos and platforms—addressing the conundrum of having both too much data and too little.

The fabric creates a larger pool of data that is more enriched, synchronized and transparent, and routes the right data to the operator who needs it.

So how does it work? Recently, the JADC2 Cross-Functional Team, run by the Joint Staff J-6, codified data fabric as a "Department of Defense federated data environment for sharing information through interfaces and services to discover, understand, and exchange data with partners across all domains, security levels and echelons." The key capability components to achieve this outcome include metadata tagging, common interfaces, and security and access controls.

Metadata tagging describes characteristics about the data such as security or origin, and supports automated processing. Applying these tags using data fabric's common design patterns and discoverable infrastructure helps make data visible, accessible, understandable, trusted, interoperable and secure.

Common data interfaces are standards that ensure data can cross boundaries where independent systems interact without losing its meaning. These interfaces are essential to getting data to and from data producers and consumers, including machine-to-machine accessibility. In both military and commercial instances of data fabric, this framework is achieved through application programming interfaces (APIs), which are software intermediaries that allow distinct applications to interact. Data fabric APIs are open and standards-based, which enables the Army to more quickly implement new and existing capabilities from multiple services and industry partners.

The final components of data fabric focus on access controls and security. Access controls determine whether an individual, or an AI algorithm, is permitted to search, retrieve, read, create or manipulate data. Data security protects the data itself—at rest and in transit, regardless of the system hosting environment—from unauthorized discovery, modification or destruction. Together, access controls and security support efficient access to, and sharing across, varied data sources without compromising the integrity of the information.

PROJECT RAINMAKER

The Army's major contribution to data fabric development thus far is called Project Rainmaker, a science-and-technology effort spearheaded by the Command, Control, Communications, Computers,

PROOF OF CONCEPT

Soldiers and DOD contractors assembled Sept. 17, 2020, during Project Convergence 20 at Yuma Proving Ground. A Rainmaker data fabric proof of concept was demonstrated there, and multiple data fabric capabilities will take part in Project Convergence 21 in October and November 2021. (Photo by Daniel J. Alkana, 22nd Mobile Public Affairs Detachment)

Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center—a component of Army Futures Command's Combat Capabilities Development Command (DEVCOM).

Rainmaker approaches data fabric from a distinctly Army tactical vantage point, prioritizing the need to mediate data between existing programs of record, warfighting functions and echelons. It targets data synchronization across disadvantaged, disconnected, intermittent and latent communications environments that commanders and Soldiers encounter at the tactical edge. Rainmaker also seeks to enable AI and machine learning tools to better access and process data to support commanders' decision-making.

Through APIs, open standards and a modular, scalable design, Rainmaker aims to be deployable across the enterprise, tactical and edge networks. It is intended to leverage a wide range of Army network hardware, from fixed-site data centers and servers at the corps and division level; to tactical server infrastructure (both on- and off-premises) and laptops at brigade, battalion and company command posts; to software on mounted platforms and dismounted Soldier devices. This tailorable approach helps to account for diminishing throughput of data at lower levels and the tactical edge.

After conducting initial lab development, Army scientists took Rainmaker to last fall's Project Convergence 20 at Yuma Proving Ground, Arizona, to experiment with data fabric in real-world conditions. Operating as a proof of concept, Rainmaker demonstrated improved sensor-to-shooter data sharing at the brigade and battalion levels, and contributed to a richer common operating picture to support detailed targeting. For Project Convergence 21 this fall, Rainmaker will be integrated with other Army network and mission command capabilities to support mission scenarios in competition, crisis and conflict.

EXPERIMENTATION AND STRATEGY

In parallel to Rainmaker development, the Army is executing complementary prototyping efforts with vendor-designed data

COMMUNICATIONS EXERCISE

The Army's Joint Systems Integration Laboratory hosted its second communications exercise in April with numerous tactical systems at Aberdeen Proving Ground, Maryland, in preparation for Project Convergence 21 this fall. Data fabric helps address the challenges of connecting and translating stovepiped data that exists throughout different warfighting function systems. (Photo by Kathryn Bailey, PEO C3T Public Affairs)

fabric technologies. In late 2019, the Army issued a request for information to industry on data fabric as part of the recurring technical exchange meeting process, which is led by the Army Futures Command Network Cross-Functional Team (CFT) and the Program Executive Office for Command, Control, Communications – Tactical (PEO C3T) to shape and target commercial innovation for potential Capability Set fielding.

After reviewing white paper submissions, the Army selected two vendors for data fabric prototyping contract awards, funded with dedicated 6.4 CFT research funds. (The 6.4 category is the DOD research, development, test and evaluation budget activity code for advanced component development and prototypes.) CFT and PEO experts conducted laboratory-based experimentation with the vendor technologies under realistic threat conditions this spring, which led to a follow-on contract award to one vendor for field experimentation at Project Convergence 21.

In addition to Rainmaker and vendor technologies, the Army is also looking at Army Cyber Command's big data platform called Gabriel Nimbus, particularly the Lower Echelon Analytic Platform, which is optimized to run at the tactical edge.

The Army's ongoing experimentation with these technologies will continue to inform and optimize the tactical data fabric, which the Army will field to operational units through an incremental approach. Although some Rainmaker data management elements are integrated into the Command Post Computing Environment

"We've got to be able to move data machine to machine very, very quickly. That is the secret if you want to get to speed, range and convergence."

(CPCE) version the Army is currently fielding with Capability Set 21, Capability Set 23 is considered the data fabric benchmark. It will expand capabilities to deliver basic analytics, initial edge cloud capability, new API interfaces and management of structured, semi-structured and unstructured data. In Capability Set 25, the data fabric, as part of CPCE, will introduce advanced analytics using AI and machine learning, a full-edge cloud capability and significantly increased capacity.

CONCLUSION

Data is a force multiplier when it can be found, made available and secured. As the Army moves toward a multidomain operations approach to warfighting—with a larger scale and a compressed timeline for leaders to understand, decide and act—the requirement to process more data, and faster, intensifies. Implementing data fabric will better equip commanders and Soldiers to access, aggregate, share and secure mission-critical data against near-peer threats. It will improve human-machine teaming, including through AI, to enhance decision-making and speed reaction time.

Data sharing also must be optimized with joint and coalition partners. Under the JADC2 initiative, the services are modernizing command-and-control technologies and procedures to process information, make decisions and direct actions of the joint force across all warfighting domains faster than our adversaries. As one aspect of JADC2 implementation, the JADC2 CFT is federating, or connecting, data fabric solutions across the Army, Navy, Air Force and other joint force elements to ensure interoperability. This "fabric of fabrics" effort will also include a clearly defined and documented API framework and standards, with the necessary security and governance to evolve data architectures over time as technology advances.

For all of the technical complexities and incremental steps, the end goal of data fabric is simple: Give warfighters what they need to make better decisions. By getting the right data to the right people at the right time and place—at the speed of relevance—the Army and joint force will gain an edge to prevail in the future fight.

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TEST DRIVE

Members of 3rd Brigade Combat Team "Rakkasans," 101st Airborne Division, provide feedback on the V-280 Valor's cabin configuration in October 2020 at Bell Flight's facility in Arlington, Texas. (Photos by Luke J. Allen, Army Futures Command)

FEEDBACK LOOP

Early input from Soldiers during systems development informs capability requirements and improves Army aviation modernization.

by Lisa Ferguson

U.S. Army Futures Command (AFC) embraces the mantra "Winning matters, but winning together matters more," in its efforts to provide Soldiers with capabilities to ensure overmatch against our adversaries in multidomain operations. Through a strong partnership with the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), AFC's subordinate units have taken innovative measures to modernize our Army. One example of this is the application of Soldier-centered design to Future Vertical Lift signature modernization efforts.

Soldier-centered design is a holistic change in how the Army generates capabilities—it puts users at the forefront of the development process, emphasizing early and frequent feedback from Soldiers. Involving Soldiers early in the design process allows the Army to get the requirements right and field useful weapon systems to the warfighter at the time of need. AFC's Future Vertical Lift Cross-Functional Team (FVL CFT) has taken such an approach with its requirements development for Future Tactical Unmanned Aircraft Systems and Future Long Range Assault Aircraft by leveraging Soldier touch points, where Soldiers can test prototypes and provide feedback.

"The best people to assess these capabilities are the operational Soldiers, the Soldiers living it every day," explained Sgt. Maj. Joseph Aird, the FVL CFT operations sergeant major.

"They took all of our feedback and were super interested in what we had to say about the aircraft."

BUCKLE UP
A Soldier from 3rd Brigade Combat Team "Rakkasans," 101st Airborne Division, evaluates a seat harness on a V-280 Valor at Bell Flight's facility in Arlington, Texas, in October 2020.

THE TEAM

Teaming up with ASA(ALT)'s Program Executive Office (PEO) for Aviation, the FVL CFT conducted a yearlong Soldier touch point with five active-duty brigade combat teams: 2nd Brigade Combat Team, 101st Airborne Division, Fort Campbell, Kentucky; 3rd Armored Brigade Combat Team, 1st Armored Division, Fort Bliss, Texas; 3rd Brigade Combat Team, 82nd Airborne Division, Fort Bragg, North Carolina; 1st Armored Brigade Combat Team, 1st Infantry Division, Fort Riley, Kansas; and 1st Brigade Combat Team, 2nd Infantry Division, Joint Base Lewis-McChord, Washington. Each brigade combat team was issued a commercial off-the-shelf unmanned aircraft system (UAS) to employ and assess at home-station training and at one of the Army's combat training centers. Soldier feedback was captured and used in developing requirements for replacing the Army's RQ-7 Shadow drone.

The Shadow is particularly noisy to launch and recover, and one of the concerns that Soldiers expressed was that the noise made it difficult for them to communicate with each other.

READY TO TAKE WING
Army Futures Command's Future Vertical Lift Cross-Functional Team, in conjunction with PEO Aviation, the Aviation Capabilities Development and Integration Directorate and the Maneuver Battle Lab, conducts flight tests in February at Leyte West Airfield, Fort Benning, Georgia.

BUY, TRY, INFORM

Army Futures Command's Future Vertical Lift Cross-Functional Team conducts test flights at Fort Benning as part of a "buy, try, inform" approach to rapidly develop informed requirements for a replacement for the RQ-7 Shadow drone.

"We're used to screaming at each other and having to use radios in order to communicate," said Spc. Christopher McCoy, a crew chief assigned to 1st Engineer Battalion, 1st Armored Brigade Combat Team. "You can stand right next to this aircraft and not even raise your voice."

In addition to needing a quieter drone, the Army also wants it to be expeditionary, runway-independent, and provide commanders maneuverability and flexibility on the battlefield. The Future Tactical UAS can be rapidly deployed into a theater of operation with a minimal strategic airlift requirement versus the Shadow. The Shadow requires a dedicated runway with specific lengths and clearance requirements, while the Future Tactical UAS can be transported organically by Army aviation and ground assets. Soldiers can maneuver the Future Tactical UAS around the battlefield and launch from nearly anywhere to meet the commander's intent. The Shadow also requires large, logistically burdensome ground-control stations and supporting equipment. In contrast, the Future Tactical UAS will have on-the-move command-and-control capability that can be accomplished by a Soldier and a laptop.

"Every day, we tear down everything. All of us tear down what we set up to fly and then put it back up in the morning," Spc. Anthony Karl, 1st Armored Brigade Combat Team, 1st Infantry Division, said about the systems during the touch point event. "We wouldn't be able to do that on Shadow. There's just no way."

THE RODEO

The yearlong Soldier touch point culminated with a Future Tactical UAS rodeo at Fort Benning, Georgia, in March. Senior leaders from across the Army observed the participating Soldiers operating their assigned systems in a flight demonstration. The feedback garnered and data collected throughout the assessment contributed to the development of well-informed requirements in fewer than 18 months, with approval through the Army Requirements Oversight Council. The Army will publish a request for proposals and go through a selection process for a planned initial fielding in fiscal year 2023.

The FVL CFT teamed up this time with the U.S. Army Combat Capabilities Development Command Aviation & Missile Center to conduct several Soldier touch point events with the Joint Multi-Role

Soldier-centered design is a holistic change in how the Army generates capabilities.

PARTNERSHIP
Soldiers and industry partners participated in the Future Tactical Unmanned Aerial System Rodeo at Fort Benning in March.

Technology Demonstrator (JMR-TD) program. The government-industry shared investment in two flying technical demonstrators has provided significant knowledge points for advanced vertical lift technologies supporting the development of a UH-60 Black Hawk replacement with a Future Long Range Assault Aircraft. The JMR-TD aircraft—the Bell V-280 Valor and the Sikorsky-Boeing SB1 Defiant—provided opportunities for several Soldier touch points, where on multiple occasions the Army has had pilots, crew chiefs, aircraft mechanics and infantry Soldiers assess each of the aircraft and provide feedback.

As members of the rifle squad conducted ingress and egress drills with their full kit, engineers took copious notes from comments on the cabin configuration, seat layout, restraint harnesses and headrests of the V-280. "The headrests were somewhat of a hindrance when wearing the Kevlar helmet and would most likely be worse if we had our NODs [night optical/observation devices] attached," commented Sgt. 1st. Class Vuthy Hamm, an operations sergeant for the 2-506th Infantry, 101st Airborne Division.

"They took all of our feedback and were super interested in what we had to say about the aircraft," 1st Lt. Gabriel Marsan, 3rd BCT, 101st Airborne Division said. "I think these touch points are valuable, because it brings the Soldier's input into the design phase."

CONCLUSION

Continued collaboration while leveraging innovative approaches like Soldier-centered design to develop requirements and streamline acquisition processes will ensure the Army gets the right capability into the hands of the warfighter today—not 10 years from now.

When asked if he thought the Soldier touch point was worthwhile, Hamm responded, "In 16 years, I've never been asked for my input on a new piece of equipment. I'm honored to have our input and suggestions heard and hopefully impact future Soldiers."

*For more information, go to **armyfuturescommand.com**.*

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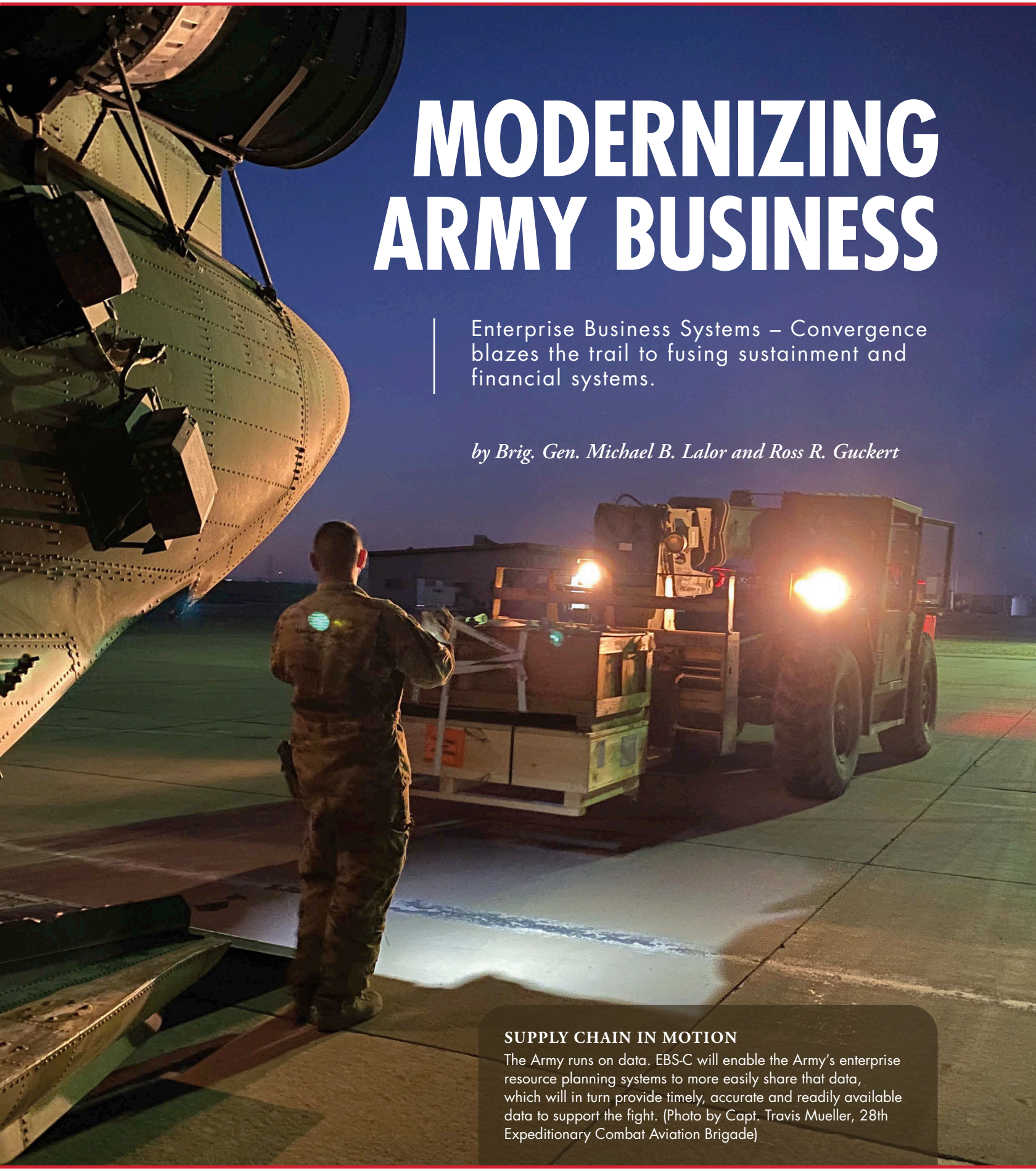
MODERNIZING ARMY BUSINESS

Enterprise Business Systems – Convergence blazes the trail to fusing sustainment and financial systems.

by Brig. Gen. Michael B. Lalor and Ross R. Guckert



SUPPLY CHAIN IN MOTION
The Army runs on data. EBS-C will enable the Army's enterprise resource planning systems to more easily share that data, which will in turn provide timely, accurate and readily available data to support the fight. (Photo by Capt. Travis Mueller, 28th Expeditionary Combat Aviation Brigade)

"You can ask me for anything you like but time."

—Napoleon Bonaparte

The Army's logistics and finance business systems are reaching their end of life, putting us at a crossroads for the next phase of modernization—and it's coming via Enterprise Business Systems – Convergence. Technology upgrades on the battlefield equip today's military to fight and win. The time is now to also modernize the Army's support structure, including enterprise sustainment systems that enable force readiness and lethality.

Globally, the Army has more than 190,000 users on its logistics and financial management enterprise resource planning systems. Every day, hundreds of thousands of Soldiers and civilians process 75 million business transactions, managing hundreds of billions of dollars in assets. These platforms interact with and impact every aspect of the Army's business operations, from ordering supplies in theater to supporting maintenance activities in garrison.

NETWORKING IN THE FIELD
EBS-C is seeking enterprise resource planning commercial off-the-shelf software solutions to support 24 major capability areas spanning logistics, supply chain, finance, real property, environmental management and defense operations. It will enable effective weapons and equipment management, maintenance and engineering, and force deployment operations. (Photo by Spc. Giovanny Lopez, 173rd Airborne Brigade)

However, the business systems we currently use—while state of the art for their time in the early 2000s—will soon reach their end of life and become unsustainable.

When the Army developed its current enterprise resource planning systems, we allowed business mission areas to customize the systems to meet their own specific needs, in areas like logistics, supply chain and financial management. Because of their separate, customized nature, the systems do not have a single transactional core. Instead, they share information through interfaces that are inefficient. Errors often require a great deal of manual labor to resolve. These inefficiencies delay decision-making and prevent timely allocation of resources.

Beyond providing a tactical advantage, employing a system that promotes accurate reporting is critical for the Army to achieve full audit readiness—meaning that the Army fully meets standards that test our ability to properly manage our systems, be accountable for our assets and, most importantly, be good stewards of taxpayer dollars. A converged system will allow the Army to pull more complete data and provide real-time information on the expenditure of funds. We must be able to trace where every dollar is going to ensure we are responsibly managing funds, while enabling Soldiers and civilians to complete their missions.

That is why, in March 2020, the undersecretary of the Army approved a modernization effort called Enterprise Business Systems – Convergence (EBS-C), which is focused on transforming the way our Army does business.

WHY MODERNIZE NOW

EBS-C is necessary because the Army's current enterprise business systems are not able to efficiently drive readiness, nor do they provide modern capabilities to execute sustainment or fiscal management operations. For example, one system manages the procurement of parts and associated costs using process A, while another tracks procurement and costs using process B. While the systems talk to each other, they are not completely speaking the same language or tracking things the same way, which affects reporting, inventory, cost management and more. Modernizing Army business systems to track and manage things the same way, in the same language, in the same system will streamline sustainment and finance business processes to increase velocity and fidelity of decisions on the battlefield.

BUCKLE UP
EBS-C will provide measurable, effective and efficient processes through improved supply chain management and integrated finance, supply, maintenance and transportation processes. (Photo by Spc. Giovanny Lopez, 173rd Airborne Brigade)

EBS-C aims to initially fuse six of the Army's major enterprise resource planning systems, including:

- General Fund Enterprise Business System (GFEBS), the Army's largest finance and accounting system.
- GFEBS-Sensitive Activities, the sensitive activities component of GFEBS.
- Global Combat Support System – Army, which supports logistical and tactical management of Army assets.
- Logistics Modernization Program, which facilitates national supply chain management of parts and equipment.
- Army Enterprise Systems Integration Program Hub, the system for master data management.
- Headquarters Army Environmental System, which provides environmental data management and reporting.

The need to support increasingly complex operational requirements for the Army of 2028 provides us with a once-in-a-generation opportunity to transform capabilities, resolve performance gaps and fuse disparate systems into a modernized platform that will more effectively enable multidomain operations in large-scale combat operations.

A DIVERSE, INCLUSIVE TEAM

EBS-C is the largest Army effort ever across the business mission area, engaging leaders and end users in cultivating a user-first environment. It is co-chaired by the assistant secretary of the Army (financial management and comptroller), the Army Materiel Command commanding general, and the Army's chief information officer. It breaks down into several components that make up the team: the Multi-Functional Capabilities Team, The Army Business Council – Multi-Functional Capabilities Team Working Group, the Army Office of Business Transformation and the EBS-C Product Management Office.

Multifunctional Capabilities Team

To develop user-centered requirements for a future converged system, EBS-C is driven by a multifunctional capabilities team (MFCT), which was activated in June 2020. This team includes experts and users from throughout the Army's business areas, including installations, training, finance, logistics, acquisition and human resources, who were specially assigned to the project to participate in business process reengineering.

The MFCT is using Agile methodology to analyze current business processes within the different systems and to define what is really needed in the future within one system. Teams of users are

participating in "sprints," or workshops, to define current business processes and to drive requirements for a future solution. Their job is to challenge the status quo—all of the ways that people are used to doing business—in order to focus the Army on what it really needs.

The success of a converged system is dependent upon the ability of system managers to adapt to the changes that are identified through business process reengineering; soliciting feedback and gaining buy-in has been essential throughout this process. EBS-C includes detailed representation from across the Army Secretariat, Headquarters Department of the Army staff, Army commands and, most critically, users in the field.

Office of Business Transformation

The Army Business Council – MCFT Working Group, chaired by the director of the Office of Business Transformation, has an advisory relationship to the MFCT. The Office of Business Transformation's role in contributing to the EBS-C effort is inherent in its mission, which is to develop business strategy and policy, enable governance and promote best-in-class business practices to improve efficiency and facilitate innovative solutions and improvements across the Army.

EBS-C Product Management Office

The Program Executive Office for Enterprise Information Systems (PEO EIS) EBS-C Product Management Office (PMO) is charged with the creation of the acquisition strategy, as well as development and deployment of the Army's modernized and converged enterprise resource planning system. The PMO will oversee the operational approach and implementation of this modernization, which will ultimately improve how all business is done and reported in a rapidly modernizing Army. The PMO is conducting a wide range of market research to explore the use of modernized acquisition strategies, principles and processes to find the best and most efficient way to make convergence a reality.

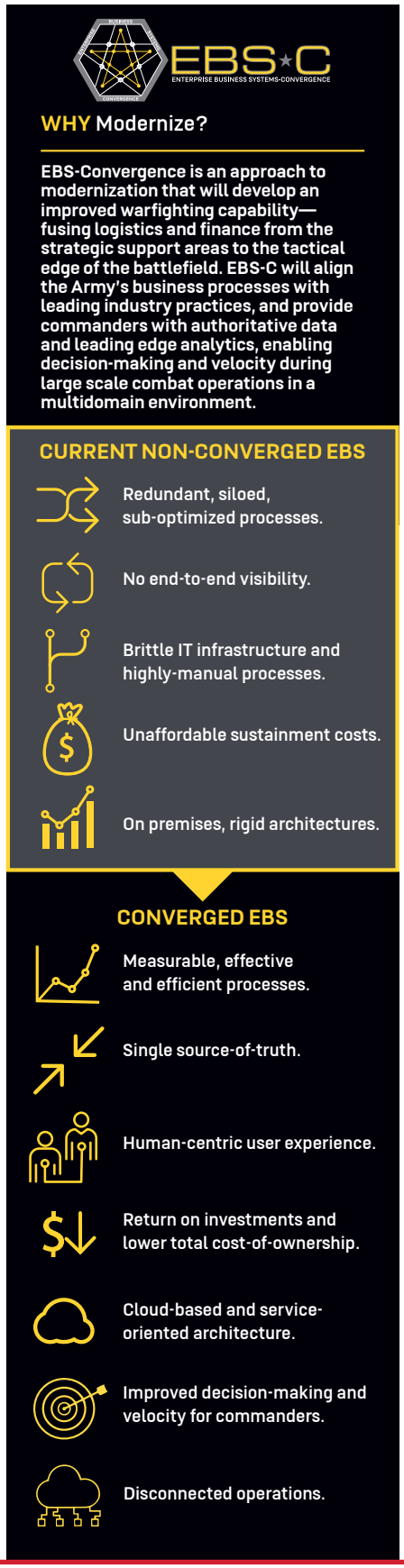
NEXT PHASE AND NEW OPPORTUNITIES

By 2027, the Army will deploy the converged system, fusing six missions into one, to manage everything from ordering and delivering tank and helicopter parts, to managing costs, and combining and sharing the data needed to win on the battlefield.

To get there, the Army will leverage the capabilities of the private sector to support in the deployment, development and integration of the system. In February 2021, the MFCT and the EBS-C PMO hosted their first industry day. More than 500 industry participants attended virtually to hear how the Army plans to partner with the commercial sector on this significant transformation project.

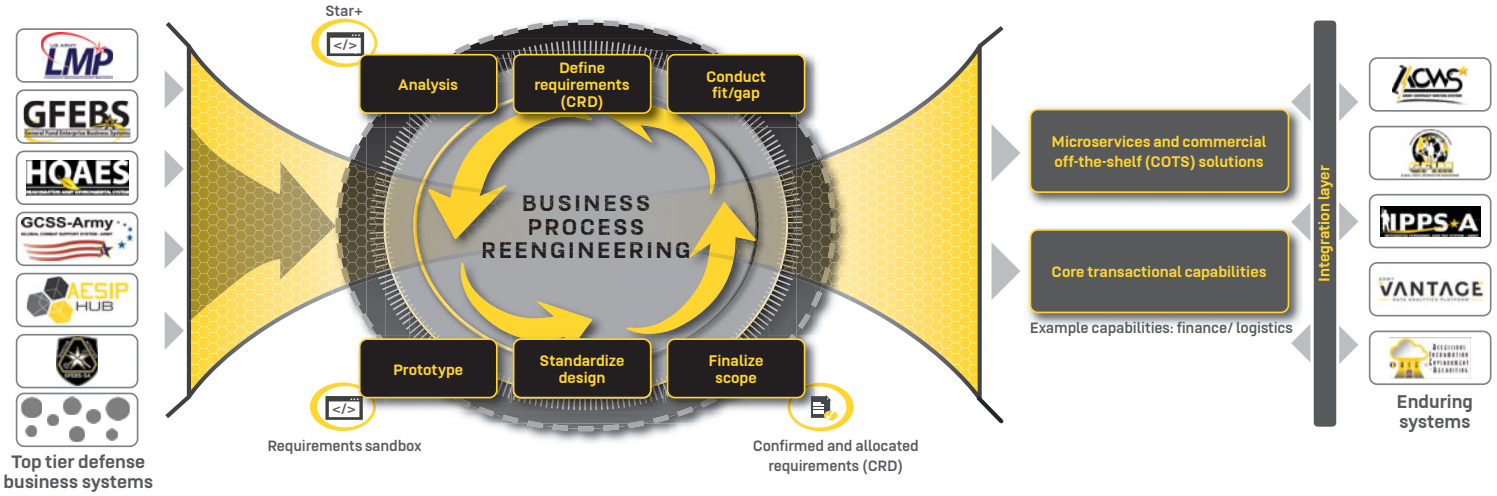
The pathway to this converged system includes an approach that is "as commercial as possible and as military as necessary," meaning that we must reap the benefits of industry best practices while providing solutions for military purposes.

The benefits of achieving converged processes that adhere as closely as possible to industry best practices will allow the Army to better plan the movement



WHY CONVERGENCE? ▶

The Army's current enterprise business systems are not able to efficiently drive readiness, and they do not provide modern capabilities to execute sustainment or fiscal management operations. (Graphic by EBS-C MFCT and EBS-C product office)



KEY

ACWS: Army Contract Writing System
AESIP Hub: Army Enterprise Systems Integration Program Hub
AIE: Accessions Information Enterprise
CRD: Change requirements document
GCSS-Army: Global Combat Support System-Army
GFEBS: General Fund Enterprise Business System
GFEBS-SA: GFEBS-Sensitive Activities
GFIM: Global Force Information Management
HQAES: Headquarters Army Enviromnental System
IPPS-A: Integrated Personnel and Pay System-Army
LMP: Logistics Modernization Program

THE ROAD AHEAD

The EBS-C process will decommission several legacy Army enterprise resource planning systems, through a comprehensive business process overhaul, which will result in modern data systems that speak "the same language" and facilitate smoother transactions. (Graphic by EBS-C MFCT and EBS-C product office)

of goods and financial resources across the battlefield and throughout the operating force.

THE TIME IS NOW

In any technology-driven business, the drive for improvement is always an imperative. The time for it is always now. That's no different for the Army.

In an era of great power competition and increased technological complexity, the Army must achieve information superiority and outmaneuver its enemies in order to carry out its mission and win our nation's wars.

We will do so by modernizing our tools and technology, including our supporting business systems, to develop an information age warfighting capability.

EBS-C is a critical component to the Army's modernization strategy that combines the different ways we do business into one system. The time to modernize our Army business is now.

For more information about EBS-Convergence, visit ***https://www.asafm.army.mil/*** *and* ***https://go.usa.gov/xFTSs.***

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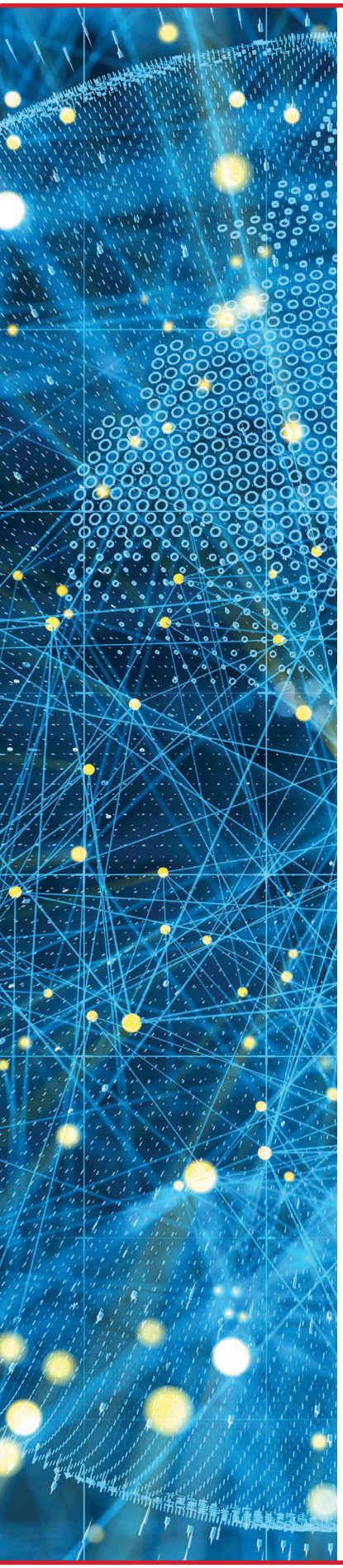
(Image by Getty Images)



THE DIGITAL ARMY OF THE FUTURE

The Army's Office of the Chief Information Officer sets the strategic direction toward a lethal, ready and digital Army of 2028.

by Dr. Raj Iyer

The Army's modernization strategy identified digital transformation as key to achieving its goal of a lethal and modern force by 2028. Keeping pace with rapid changes in technology has been historically challenging for the Army as a result of inflexible institutional processes, legacy policies that have not kept up with new technologies, such as cloud and artificial intelligence (AI), and a workforce that is not empowered to innovate at scale.

To better position the Army, the Office of the Chief Information Officer (CIO) is tasked with driving a comprehensive digital transformation strategy. This new strategy boldly invests in transformative digital technologies, reforms institutional processes and builds a workforce equipped to operate in increasingly complex environments.

Digital transformation in the Army requires a holistic approach to doctrine, organization, training, materiel, leadership, personnel and facilities, to enable new digital technologies such as cloud, data and AI to fundamentally transform processes. This will enable a culture change in the Army to one that is agile, innovative and tech savvy. As the Army's modernization strategy states, such an approach is critical to the U.S. Army maintaining digital overmatch against our strategic competitor adversaries both in competition and conflict.

GET TO KNOW THE OFFICE OF THE CIO

To achieve digital transformation at scale across the Army, required the service to establish a new organization with a focus on developing and fielding forward-leaning technologies across the enterprise, to establish new policies consistent with digital technologies, and to establish the framework for the digital workforce of the future. All of this is to be accomplished in a fiscally constrained future. On Aug. 31, 2020, the Army separated the Office of the CIO from the Army deputy chief of staff, G-6 (DCS G-6), to serve as a new principal official in the secretariat.

The CIO serves as the principal adviser to the secretary of the Army, setting the Army's strategic direction, policy and oversight for information technology, cloud, cybersecurity and data. The DCS G-6 is the senior military adviser to the chief of staff of the Army and the CIO on policy planning and implementation, with specific responsibilities to set the unified network for multidomain operations.

DEPLOYMENT READY

Dr. Raj Iyer, chief information officer for the U.S. Army, greets Maj. Gen. Xavier Brunson, the America's First Corps commanding general, for a briefing July 28 during Forager 21 at Andersen Air Force Base, Guam. The exercise demonstrates the U.S. Army Pacific's strategic-level readiness to deploy a combat-ready force. (Photo by Pfc. Richard Mohr, 28th Public Affairs Detachment)

EARLY ACCOMPLISHMENTS

The Office of the CIO established a few foundational changes very early on to kick-start digital transformation in the Army. The first was to establish a new governance structure to enable synchronization, prioritization and integration of the various digital efforts underway. The Army Digital Oversight Council, chaired by the CIO, is the first such across DOD to integrate efforts across mission areas and to serve as the integrator for the planning, programming, budgeting and execution process to ensure the Army's $15 billion annual information technology and cyber budget align with Army priorities.

In January 2021, the Office of the CIO elevated its Enterprise Cloud Management Office to the status of field operating agency and renamed it the Enterprise Cloud Management Agency, granting the Office of the CIO greater autonomy and flexibility. This agency is committed to the adoption of new cloud and digital technologies across the enterprise. Since its inception, the agency has established the Army's first accredited development, security and operations platform called CREATE (the Coding Repository and Transformation Environment) in support of the Army Software Factory, established both unclassified and classified cloud environments in commercial cloud service providers called cArmy, and established a centralized contract for discounted procurement of cloud services. The agency also supported the migration of several mission-critical applications to the cArmy cloud resulting in early cost savings for the Army.

The Office of the CIO also provided oversight to the Army's implementation of the cloud-based Army 365 collaboration platform across 1 million users worldwide—considered the largest Microsoft 365 implementation ever, following only Walmart.

These recent accomplishments are a great source of pride, but ultimate success will come from the Army's ability to achieve a digital Army of 2028. In that light, the Office of the CIO developed an integrated,

collaborative and holistic approach to guide future efforts—the Army enterprise digital strategy.

THE ARMY ENTERPRISE DIGITAL STRATEGY

The Office of the CIO's Army enterprise digital strategy will lead the Army through changes in technology, processes and overall culture. The strategy establishes the vision for how digital transformation can help achieve the Waypoint 2028, the Army's construct for victory in multidomain operations. The strategy indicates clear lines of effort leading to this objective, identifies priorities for the Army to resource, and outlines an integrated master plan to synchronize and better integrate all ongoing activities to achieve the digital-age Army.

The strategy outlines lines of effort to support each of the objectives relating to modernization and readiness, reform and people and partnerships.

OBJECTIVE 1: A digitally-enabled, data driven Army propelled by digital transformation.

The Army's current digital initiatives are siloed across mission areas, inhibiting the interoperability needed to support multidomain operations. In addition, the Army continually struggles with prioritizing resources for modernization over current year operational readiness. This has led to costly maintenance of legacy systems that are not sustainable and perpetuate silos while simultaneously investing in priority modernization efforts like cloud computing. Similarly, the Army has struggled to balance resourcing information technology (IT) service delivery and cybersecurity across the enterprise while also prioritizing modernization of the unified network.

Between 2021 and 2028, our goal is to converge current digital initiatives that support readiness and modernization into a single integrated plan, enable these initiatives at the enterprise level so they are available to the total Army from the tactical edge to the enterprise core, and establish standardized service delivery processes, methods and tools, all fully leveraging cloud as an enabler. We will develop an Army that seamlessly shares data and information for timely insights to warfighters, commands and enterprise functions, in direct support of Army readiness and modernization.

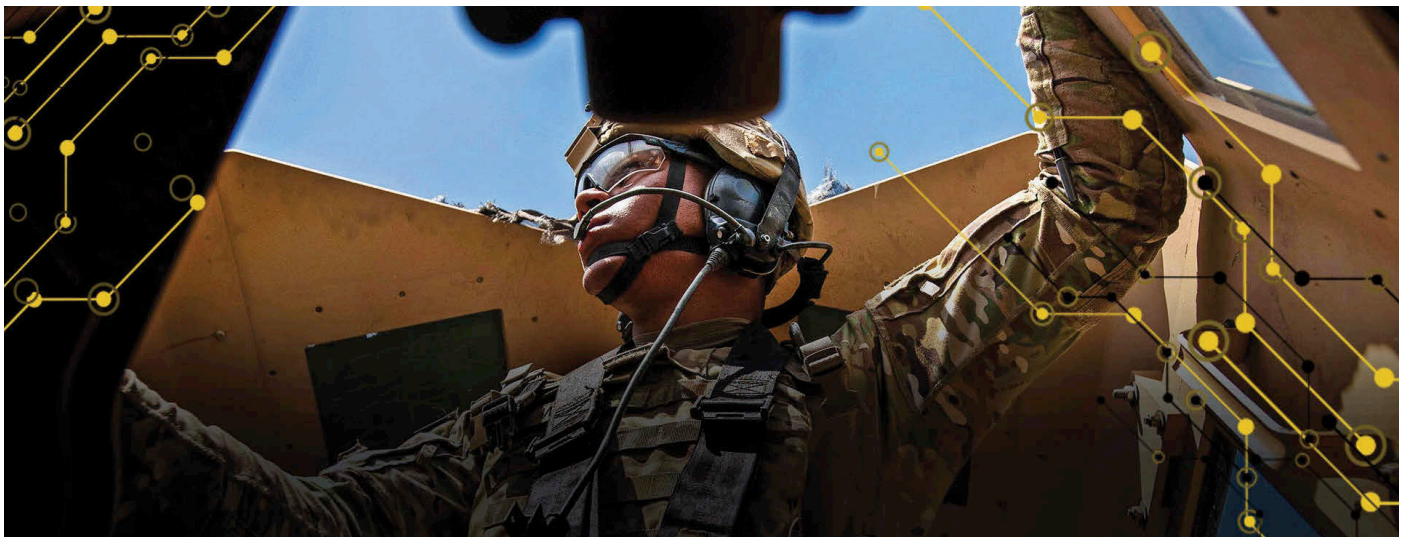
OBJECTIVE 2: Optimized and mission-aligned digital investments providing greater value to the Army.

Operational excellence is an imperative for the Army in light of the tight fiscal reality. With the evolution of technology, commercial organizations are finding lower cost, more efficient and innovative ways to run and invest in their enterprises. The Army seeks to maintain pace with the evolving advancement of technologies, but this requires a reevaluation of priorities, resourcing and investments.

Current challenges include limited visibility into our IT portfolios, inflexible and waterfall IT acquisition processes, and ineffective IT investment accountability and oversight. These challenges prevent us from ensuring our resources and spending are best aligned to save costs, improve operations and ultimately harvest these savings to modernize the Army through digital transformation.

CODE WARRIORS

The Army must instantly share data and information to warfighters and commands in direct support of Army readiness and modernization. The Enterprise Cloud Management Agency established the Army's first accredited development, security and operations platform in support of Army Futures Command's Software Factory in Austin, Texas. (Photo by Luke J. Allen, Army Futures Command)



IN OUR SIGHTS

"The Army must be manned, trained, equipped and modernized to be ready to fight today, but also to meet the demands of an uncertain and unpredictable future," said Secretary of the Army Christine Wormuth. (Image by U.S. Army)

Our goal is to optimize the Army's resources and enable confident investment decisions that are data driven and objective while at the same time ensuring direct alignment of these investments to Army priorities. With improved and more efficient institutional processes for acquisition, budget and portfolio management, the Army can ensure better alignment of digital resources to current and future digital requirements.

OBJECTIVE 3: A tech savvy, operationally effective digital workforce partnered with a robust network of allies, industry and academia.

People drive success. Our people and our relationships with allied partners are vital to achieving our goal to dominate in multidomain operations. In today's digital transformation revolution, simply having the newest technology is not sufficient—we need the right digital skills to optimize and fully apply the technology through innovation. Similarly, simply having strong partner relationships is not enough—the Army needs proper channels, networks and systems in place to effectively collaborate and communicate. The Army faces internal challenges with ensuring its workforce can understand, develop, apply and enable digital priorities as well as external opportunities to improve collaboration with allies, academia and industry. Our goal is to embrace the recognition that people drive Army's success on and off the battlefield. Robust recruiting, training programs, digital career models and partnerships with academia and industry will build a digital ready, adaptive and innovative workforce. In addition, sustained communications and interoperability with allied nations will ensure we optimize our ability to collaborate in all domains.

The Office of the CIO has established 13 priority lines of effort to support the three objectives listed above. These priorities will drive resourcing decisions in future in austere fiscal conditions, while at the same time achieving unity of effort across the Army. The Office of the CIO is working closely with the DOD CIO, joint staff, the Defense Information Systems Agency and other military department CIOs to better integrate and leverage lessons learned from each agency, while also staying fully aligned with the DOD CIO's digital modernization strategy. Priority initiatives in the strategy will be monitored through the oversight council to ensure they meet mission outcomes. At the same time, the Office of the CIO is reviewing and updating current policies to ensure they are not an impediment to innovation and fully support digital transformation.

SAY HELLO TO THE ARMY OF THE FUTURE

The Office of the CIO is setting the stage for digital transformation and collaboration across the Army enterprise and around the world. The Hon. Christine Wormuth, secretary of the Army, said, "The Army

GUIDING THE WAY
The Army Enterprise Digital Strategy seeks to invest in transformative digital technologies, reform digital investments and build a tech-savvy workforce equipped to operate in increasingly complex environments. (Graphic by the Office of the CIO)

must be manned, trained, equipped and modernized to be ready to fight today, but also to meet the demands of an uncertain and unpredictable future." Coordinated, prioritized efforts supporting modernization and readiness, reform and people and partnerships will make the vision of a digital Army of 2028 a reality. Building an Army mission-ready for the challenges of tomorrow requires adopting transformative technologies, efficient processes, and a culture of continued education and innovation today.

For more information, go to ***https://www.army.mil/cio****.*

DR. RAJ IYER is the U.S. Army chief information officer for information technology reform. Before assuming his current role, Iyer served as the managing director for government and public services and senior manager, technology strategy, defense and national security for Deloitte Consulting. Before Deloitte, he held various roles in information technology within the commercial and military space. His top civilian awards and professional achievements include the Meritorious Civilian Service Award, the International William Conroy Standards Professional Award, and dozens of published peer-reviewed papers. He holds a Ph.D. in electrical engineering from the University of Texas, an MBA from the Ross School of Business, University of Michigan, an M.S. in electrical engineering from the University of Texas, and a B.S. in electrical engineering from India's National Institute of Technology.

EDWIN D. MARTINEZ-VEGA

COMMAND/ORGANIZATION: U.S. Army Test and Evaluation Command, Aberdeen Test Center

TITLE: Senior test officer

YEARS OF SERVICE IN WORKFORCE: 10 years

DAWIA CERTIFICATIONS: Level III in test and evaluation, Level I in engineering and program management

EDUCATION: B.S. in mechanical engineering with a minor in aerospace engineering, University of Puerto Rico, Mayagüez

AWARDS: Department of the Army Civilian Service Commendation, 2020 and 2021

SPOTLIGHT ON SAFETY

"From a very young age, even before the age of 6, I knew I wanted to be an engineer," Edwin Martinez-Vega recalled. "I never had any doubts about that." Like many children, he had a fascination with airplanes and he wanted to know who was responsible for building them. "Somebody said, 'Planes are built by engineers,' and so I decided right then that I would be an engineer, no question." And though the path wasn't always easy, he kept his eyes on the goal.

He breezed through high school, before applying to and being accepted into the engineering program at the University of Puerto Rico. Once there, he said, he struggled to keep up with his peers academically. "I never had to study before, so it was difficult for me. I definitely wasn't the smartest kid anymore—my class, entering the engineering program, had 110 students, and I believe 109 of them were smarter than I was," he said. His grades suffered and he couldn't see—even while studying engineering—how he would ever reach his dream of building planes. "I was lost," he said. And then two things happened that changed the course of his life. He found some other airplane enthusiasts, and he met a girl. "I heard about this engineering competition team that built planes, and they had a chapter at the school, so I went to talk to them. That really gave me a sense of direction—I finally could see how the dots connected, from what I was studying to where my goal was."

And about that girl—*the* girl, actually—when Martinez-Vega took a job working the front desk at a nearby hotel, he met his future wife, Alondra, and the remaining puzzle pieces began to fall into place. "She worked the midday shift and I was on the night shift. I started arriving earlier, she started leaving later." The connection was immediate, and they married in 2011, after he had taken a job at Aberdeen Proving Ground, Maryland, and she had moved to New York for her doctorate.

Since that first Army job 10 years ago, he has found a string of opportunities at Aberdeen. Today, he works as the senior test officer for U.S. Army Test and Evaluation Command, Aberdeen Test Center. "I am a senior test officer in charge of automotive and fire-control programs. We test systems that are either legacy, new programs of record or technology demonstrators. Testing addresses safety and performance concerns to provide the data for evaluation and action by oversight and decision-makers," he explained.

"There are very good opportunities—always jobs opening on the installation. I believe now, it's up to 20,000 civilian and contractor positions. There are big organizations here, and they keep adding more, so yes, there's a wealth of opportunity."

When he is asked for career advice, he has two suggestions for junior acquisition professionals. "I have received a lot of advice throughout my career, giving me much to pass along to others," he said. "One piece of advice that applies more generally to the acquisition world is that every program is different and its differences must be considered when applying standard practices." His second tip for colleagues—always know *why*

INTO THE BREACH
Martinez-Vega at a June 2018 test of the Assault Breacher Vehicle at Aberdeen Test Center. (Photo by Aberdeen Test Center)

things are done the way they are. "That it is always done this way should never be the answer. The reason for a decision or action matters as much as the action itself," he said.

It was a love of airplanes that got him into the world of engineering, but it's the love of his family that keeps him focused on his work. In fact, he said, having a family has fundamentally changed the way he approaches his job. "I optimize tasks to make sure my team does not lose long weekends or have to spend more hours at work than they should," he said. "Family also makes my drive for Soldier safety stronger than ever."

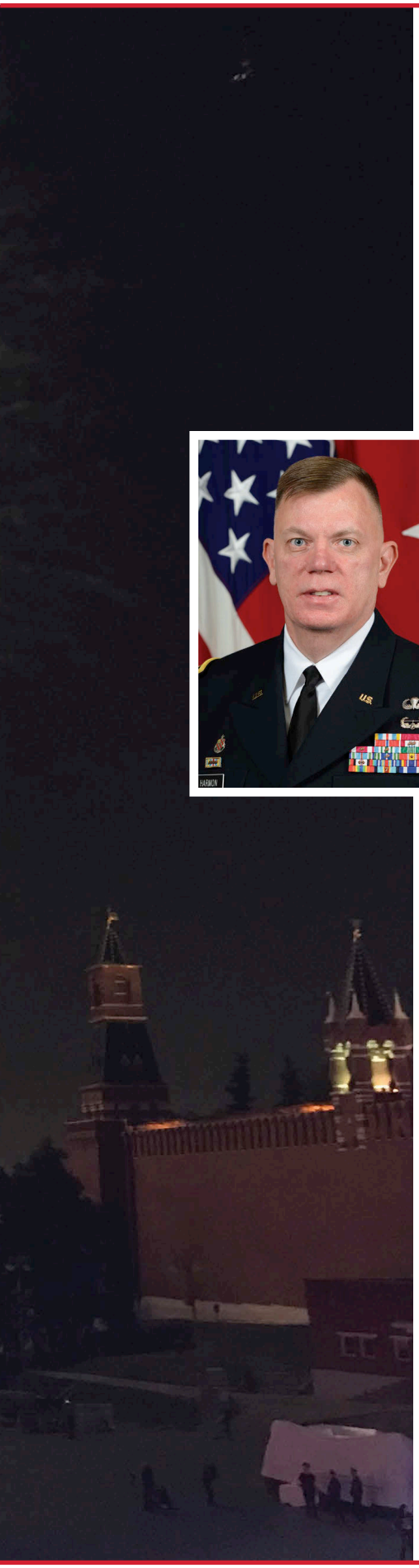
He recalled seeing a poster on the walls of his office building several years ago—an image of a Soldier with two young children, as a reminder of the importance of safety. "Being a Soldier is a dangerous duty—there's no way around that fact—but a Soldier should not fail to return home to their family because their equipment was unsafe or did not work right when they needed it to," he said. "When I'm doing my job, in a situation where I have a decision to make—am I going to speak up or not? Am I going to be that person right now, or not? I think about those kids and I think about *my* kids, and it makes the choice really easy."

Throughout his career, Martinez-Vega said, that is the most important lesson he has learned—staying true to his standards. "I learned that when I was younger but I've applied it continuously through my career," he said. "If I do not compromise my values, I will not regret my decisions, even if the consequences are difficult." He has also stayed true to his original dream of working with airplanes, though he hasn't achieved it just yet. "I don't work with aircraft, which is, I guess, a left turn I took." But he's still working toward that goal. "I am currently part of the Academic Degree Training program to earn my M.S. in aerospace and aeronautic engineering," he said. "It was a life goal—an *expensive* life goal—more than a career goal. After I'm done, perhaps I'll move to an aviation position, but I'm not sure yet what the future holds. Maybe I'll pick up a hobby after that."

—ELLEN SUMMEY

HOT AUGUST NIGHT

Fireworks above Red Square in Moscow in August 2019. Part of Harmon's job as U.S. senior defense official and defense attaché to the Russian Federation was to ensure fireworks didn't turn into a firefight. (Photo by Brig. Gen. Garrick Harmon)



FINDING COMMON GROUND

Brig. Gen. Garrick Harmon, commander of USASAC, shares his insights on enterprise collaboration, forged in fire while he was the senior U.S. military official in Russia.

by Ellen Summey

If you're the DOD senior military representative to the Russian Federation, it's your job to keep the lines of communication open—even when things are really, really difficult. The stakes are too high and any miscommunication could lead to conflict.

"One of the worst things that could have happened to us would have been an incident over the Black Sea, for example, where two aircraft accidentally clip wings, and something unfortunate happens," said Brig. Gen. Garrick Harmon. "If the first part of our conversation was going to be, 'Hey, what's the phone number to that one guy that we used to talk to?' That's the position we didn't want to be in." Now the commanding general of U.S. Army Security Assistance Command (USASAC), Harmon was previously the U.S. senior defense official and defense attaché to the Russian Federation. "When you're trying to prevent a miscalculation from escalating into a full-blown crisis, established lines of communication are vital," he said.

Harmon has made a career of building relationships through his work as a foreign area officer (FAO), and he shared his insights on enterprise collaboration during an interview with Army AL&T in June.

FIT FOR PURPOSE

USASAC is known as the "Army's face to the world," because of its established, enduring relationships with nations worldwide and because it leads Army Materiel Command's security assistance enterprise, developing and managing security assistance programs and foreign military sales with allies and partners. When Harmon assumed command of USASAC in May, he spoke about the critical nature of this

type of work. "At a time of increasing levels of military competition around the globe, and as we seek to expand the global land power network as part of our approach to a multidomain Army in competition, the important role of security assistance through foreign military sales will continue to grow," Harmon said. And with $209 billion worth of foreign military sales in more than 135 countries, the command's scope is huge.

Harmon's extensive experience as a foreign area officer has given him a unique perspective on this type of collaborative, relationship-focused work. "I'm not the traditional sustainment or acquisition officer, but I have sat on various sides of this important enterprise over my career as an FAO," he said in the interview. "The end state is 'win in competition, be decisive and prevail in conflict and crisis,' and we're only going to do that with allies and partners."

Gen. Edward M. Daly, commanding general of Army Materiel Command (AMC), presided over the ceremony at Redstone Arsenal, Alabama, and spoke about Harmon's unique qualifications for the job. "He has spent the last 22 years studying foreign nations and languages, and serving in international posts from Germany to Spain, to Georgia to Afghanistan, along with several Pentagon assignments," he said.

That's putting it mildly.

COLLABORATION COUNTS

Harmon was selected as the U.S. senior defense official and defense attaché to the Russian Federation in 2018, after serving in a number of Defense Intelligence Agency assignments in Estonia, Georgia and Russia. Being a high-ranking American diplomat and the senior DOD representative in Russia at that time—amid widespread protests over domestic conditions, tit-for-tat expulsions of diplomats over a suspected nerve agent attack in the U.K., the COVID-19 pandemic and the ongoing controversy about Russia's alleged tampering with the 2016 U.S. presidential election, among a litany of other difficulties—is probably not anyone's idea of a walk in the park. "Simply put, it was an extremely challenging period, but I had the honor of working with an exceptional interagency team to navigate a complex landscape," Harmon said.

Not only was he tasked with navigating the fraught relationship between the U.S. and Russia, he also faced administrative and staffing hurdles in his own office. "I was the first DOD person back into Embassy Moscow following all the Russian

CONSULTING ALLIES
Harmon, left, speaks with senior military members of the Polish army during a June 1 meeting at Redstone Arsenal, Alabama. (Photo by Tim Hanson, USASAC)

WARMING UP
Harmon, right, meets with Finnish reserve officers at an international military competition near Johvi, Estonia, in January 2008. (Photo courtesy of Brig. Gen. Garrick Harmon)

"With any organization, it's really the people that are the key of what we do."

government-directed staffing reductions in September 2017, followed by the diplomatic expulsions in April of 2018. The DOD presence in Moscow had been reduced by almost 80 to 85 percent over that period of time," he recalled. "Instead of the full office that I was accustomed to in my first tour, I arrived back to an office that had three people that had to manage that very difficult relationship for a period of about eight months with limited support," he said.

But even in that very tense environment, Harmon said he knew his mission was to focus on dialogue and engagement. As any therapist would confirm, sometimes the most difficult relationships require the most intentional conversations. "Even at the height of the Cold War, the U.S. and the Soviet Union always had to find a way to have lines of communication with each other. We had to find a way to ensure that we didn't inadvertently create a situation where we introduced risk of miscalculation and escalation and increase the likelihood of a crisis or a conflict because of lack of dialogue and lack of understanding," he said. "In that very difficult environment, at my level, we valued the ability to talk, military-to-military, for the purposes of transparency and risk reduction, about our activities and what we were doing, with the goal of also trying to understand Russia's strategic intentions. Of course, bilateral dialogues require equally committed and transparent interlocutors."

Thus, the earlier hypothetical Black Sea scenario. As the U.S. senior defense official in Russia, that late-night phone call would have been Harmon's to make.

THE ART OF ALLIES

Thankfully, the U.S. has more congenial relationships with the bulk of its other international partners. Harmon cited his time in Estonia as one example, and said there are important lessons to be learned in those experiences, as well. "In a place like Estonia, what you learn is that we have a lot of great allies and partners out there. The ability to get to work with them side by side, when it comes to training and exercises, when it comes to capabilities acquisition, working with a partner and really understanding them, understanding their military and how we can work together bilaterally and multilaterally, it was a great case study in how to do things well," he recalled. "Through our close relationship with the Estonians and by extension, our close relationship with other Baltic nations, you really learn about engagement, you really learn about the importance of allies and partners. You also really understand the threat from a partner perspective, too, and how [our work] with allies and partners in military competition becomes absolutely critical to face that threat."

Managing international collaboration and engagement on such a large scale requires certain skills and experiences, Harmon said. "It starts with some of the key skillsets that all FAOs need to have, which is really the critical thinking, the analysis, the clear and effective communication. Being able to provide clear, cogent recommendations, well informed by your nuanced understanding of a host nation, the broader region and the threat, to senior leaders is important." Those officers, perhaps better than anyone else in the security assistance enterprise, understand their host nations and the threats they face, so it's important to harness that expertise "so that we can help deliver what a nation requires to support its national defense as well as regional or global operations" through security assistance or foreign military sales, he said.

FLYING HIGH
Harmon with Army astronaut Col. Andrew Morgan at Baikonur Cosmodrome, Kazakhstan, prior to Morgan's launch to the International Space Station in July 2019. (Photo courtesy of Brig. Gen. Garrick Harmon)

"It starts from that understanding that can only come through routine engagement. It starts with that clear, concise communication, and the understanding of shared interests and opportunities."

LEADERSHIP PRIORITIES

Harmon is, by virtue of his international experience, a natural advocate for the work of USASAC, and he's a champion for his

A CAREER IN THE MAKING

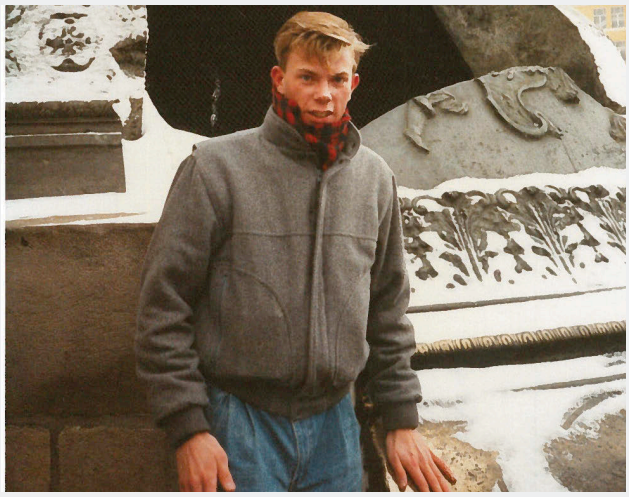
Since he was just a kid growing up in Hutchinson, Kansas, Brig. Gen. Garrick Harmon was determined to join the Army—a goal he pursued with single-minded determination. "For as long as I can remember, that's all I ever wanted to do," he said. According to his parents, the fascination began with a family trip to the Dwight D. Eisenhower Presidential Library and Museum in nearby Abilene. Eisenhower, one of only eight U.S. Army officers to attain the rank of five-star general officer, General of the Army, seemed to make a lasting impression on then-5-year-old Harmon. "That one engagement 46 years ago set the path for what has become multiple decades of Army service."

But if Eisenhower was the inspiration, Harmon's high school teacher was the foundation of his success. "Here we are in Hutchinson, Kansas, a relatively small town. One of the best teachers in the high school was a man by the name of Gary Hughes." Hughes taught honors courses, and it was widely accepted that "if you wanted to be the most prepared for college that you could be, you studied with Gary Hughes. Whatever classes Gary taught, those were the classes that you took." In Harmon's senior year, that class happened to be Russian history. "Whether I knew that to be the case or not at the time, studying with him, and that class in particular, is what set me on the course to, arguably, doing what I do now. It is an example of the powerful influence of a great educator."

While still in high school, Harmon participated in a Pittsburg State University exchange program to the Soviet Union. "In March of 1988, I had my first trip to the Soviet Union. By the time I went to West Point, when it came time to pick a major, I knew what I wanted to do, which was Russian history and Russian language." In the summer of 1991, as a U.S. Military Academy at West Point cadet, Harmon returned to the Soviet Union for another exchange program at Moscow State University. "This was just prior to the August coup of 1991, which preceded the fall of the Soviet Union about six months later, so a very unique period of time."

He commissioned into the field artillery as a second lieutenant in 1992 and was stationed at Schofield Barracks, Hawaii, and Fort Sill, Oklahoma. But after battery command, "I wasn't really sure what I wanted to do next," he said. Harmon said several of his former classmates were facing similar circumstances at the time. "Some of them went Acquisition Corps, some went to law school. We all decided we wanted to continue to serve in our great Army, but we wanted to serve in ways that maybe were different from the standard operational track." When presented with the opportunity to attend the Defense Language Institute for Russian, "I said absolutely."

"My FAO [foreign area officer] career began in about October of 1998, and [I] have never looked back. It was just my background and then a series of opportunities that presented themselves at the right time and, here I am, 23 years later, kind of doing the same thing." Indeed, he later completed an M.A. in Russia, Eastern Europe and Central Asia studies from Harvard University and an M.A. in strategic studies from the Army War College. "The professional opportunities, as well as the family opportunities to repeatedly live abroad, travel extensively, understand other cultures and languages, becoming a foreign policy and regional expert, while having a strategic impact as a relatively junior officer," have been rewarding for Harmon. "The decision to become a FAO was the right one," he said.



EARLY EXPERIENCE
Harmon visits the Kremlin grounds in Moscow on his first trip to the Soviet Union in 1988, through an exchange program with Pittsburg State University. (Photo courtesy of Brig. Gen. Garrick Harmon)

workforce as well. When discussing his goals as commanding general, he spoke highly of his predecessor and the strategic goals he established. "Even before I got here, the team had already done an enormous amount of work, and the previous [commanding general, Brig. Gen. Doug Lowrey] too, developing a security assistance enterprise strategy for 2021," he said.

The command identified three lines of effort, roughly centered on people, modernization and program execution. Harmon said he will continue working toward those priorities and look for opportunities to make foreign military sales more agile and responsive to partner needs in support of military competition.

"My focus will be on further building out those lines of effort," he said. "With any organization, whether it's USASAC, the Army, DOD or beyond, it's really the people that are the key of what we do, and we need to invest in and grow the security assistance experts of the future. For this organization, it's the people that execute the process, it's the people that lead the engagement, it is the people that deliver the strategic effect that we're seeking with allies and partners. … I tell people, even if you spend your day in a cubicle, staring at a computer screen, if you ever doubt the impact that you have at the strategic level, disabuse yourself of that now. Everything that you do here on a day-to-day basis, managing a difficult and critical process, has a strategic impact with an ally or partner that is almost immeasurable."

The organization's other primary goals—modernization and program execution—center on the ins and outs of security assistance. USASAC will prioritize the measured, coordinated execution of its comprehensive security assistance program, Harmon said, while also focusing on where it can improve. "Are we doing everything possible to build partner capacity, are we supporting what the combatant commands want to do, and how are we helping to reinforce the trust and further build those relationships around the world through foreign military sales?" he said.

"We'll want to look at how we want to modernize the AMC security assistance enterprise for tomorrow," Harmon continued. "Through innovation, new ideas and understanding what we can do to better position the [enterprise] within the existing policies and processes. Do we have the right authorities, do we have the right policies and processes to be as agile as necessary so that we can effectively compete?"

And with the Army's sights set on modernization, Harmon said USASAC will help ensure that the U.S. remains interoperable with its allies and partners. "It will be important to understand where Army modernization is going and how it may drive future FMS opportunities, while also preserving the ability to be interoperable with allied and partner legacy systems, because that level of interoperability remains absolutely critical in a future conflict," he said.

CONCLUSION

Collaboration is more than a nice-to-have for the United States and its international partners. It's the foundation on which the nation will build its future. "Our senior leaders have said it many times—we are not going to fight the next war by ourselves, we're going to do it with allies and partners. A command like this allows us to bring together the understanding of the threat, the understanding of priorities and opportunities, and the understanding of the importance of foreign military sales in support of ally and partner requirements. The security assistance enterprise will ensure that we can compete effectively, and FMS gives us that network that we need so that, should there be another conflict, should there be another crisis, we will be decisive in our victory, as a result of years of investment in our relationships.

"It's that work that we do over time that guarantees the success of the future."

For more information, go to ***www.army.mil/usasac/****.*

PREPARE TO BOARD

Harmon at Naval Air Station Sigonella, Sicily, before embarking to the USS Enterprise in the Mediterranean Sea with the president, minister of defense and chief of defense of Estonia in December 2007. (Photo courtesy of Brig. Gen. Garrick Harmon)

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SHARED GOALS

Command Sgt. Maj. Sean Rice, left, senior enlisted adviser at U.S. Army Security Assistance Command (USASAC), speaks with soldiers assigned to the aviation maintenance unit of the Colombian army base in Tolemaida, Colombia, in April. Rice and other USASAC leaders visited several sites to see the impact of U.S. security assistance and foreign military sales, in support of the Colombian military in defending against narcotic and terrorist threats. (Photo by Richard Bumgardner, USASAC)

SECURITY COOPERATION REFRESH

An all-of-Army approach to building foreign capability will advance U.S. coalition readiness.

by Robert Maginnis and Michael Prater

Until 2018, a significant shortfall in the Army's international engagement strategy was a self-imposed division of labor between conventional forces' exercise-centric security cooperation and the materiel-focused security assistance enterprise, which resulted in less than optimal outcomes. Congress helped the U.S. Army rethink this synergy of effort by issuing new guidance via the National Defense Authorization Act (NDAA) for Fiscal Year 2017, which promises to result in better designed capability that meets U.S. and partner shared security goals.

DIVISION OF LABOR

The Army's operational forces conducted security cooperation through troop exercises, information sharing and key leader engagements for decades. Meanwhile, the Army security assistance enterprise worked out of the limelight, remaining mostly materiel-focused and tethered to the State Department's 22 U.S. Code, Subchapter II—Foreign Military Sales authorizations. The bifurcated foreign engagement activities infrequently overlapped, undercutting the Army's true potential for helping prepare foreign partners to defend themselves as well as strengthen U.S. Army units for coalition operations and reach the aspirational outcome of robust interoperability—a "stretch goal" for Army commanders and our best foreign partners.

The Army's division of security cooperation labor is the result of a decision made decades ago to split into two international engagement entities previously housed under the deputy undersecretary of the Army for international affairs.

The first entity in this division of labor is the Army secretariat represented by the deputy assistant secretary of the Army for defense export and cooperation (DASA (DE&C)) under the authority of the assistant secretary of the Army for acquisition, logistics and technology. DASA (DE&C) oversees the transfer of materiel, engineering activities and related training for foreign partners such as servicing foreign military sales cases and armaments cooperation agreements to leverage foreign

FOREIGN CLASSROOM
Puerto Rico National Guard Staff Sgt. Pedro Ramos teaches a bridge-building course in June to soldiers in the Honduran armed forces at Siguatepeque, Honduras. (Photo by Spc. Ashley Fletcher, 55th Combat Camera)

technologies and capabilities that support Army readiness, modernization and interoperability goals.

The balance of international engagement activities was assumed by the Army's chief of operations, the assistant chief of staff G-3/5/7, which oversees the day-to-day maneuver-related engagements with foreign partners. That partition of effort can result in conflicting messages to foreign partners and less than optimal outcomes for the Army's contribution to DOD's strategic goals of building partner capabilities and preparing for global coalition operations.

REDEFINING COOPERATION

Fortunately, those disjointed outcomes are now merging into a far more synergistic endeavor thanks to that NDAA, and in particular the codification of Title 10, Chapter 16, "Security Cooperation."

Congress redefined nearly everything DOD does with a foreign partner as "security cooperation." That definition includes not just exercises and information sharing—which are the traditional forte of operational forces—but the Army's support of State Department-approved foreign military sales cases, direct commercial sales, the training provided to foreign partners at our schoolhouses and other programs as defined by Title 22 Security Assistance, a State Department authority executed by DOD.

Importantly, the new law mandates the creation of a formalized assessment, monitoring and evaluation efforts to foster more accurate and transparent reporting on the extent to which DOD achieves security cooperation outcomes and an evaluation of the reasons for success or lack thereof. This new accountability requirement aims to identify and disseminate best practices and lessons for security cooperation to inform decisions about policy, plans, programs and workforce. The law also requires an annual report to Congress on the measurable results of U.S. security cooperation investments.

Meanwhile, the Office of the Secretary of Defense for Security Cooperation issued assessment, monitoring and evaluation guidance as well as produced helpful guides such as "Standards and Guidelines for Security Cooperation Assessment," which provide security cooperation programs and activities with standards, guidelines and tools to inform decision-making. Much of this new guidance places the task of assessing, monitoring and evaluating the security cooperation investment on the executing unit or agency, and the results are collected annually by the Office of the Secretary of Defense for Security Cooperation for a report to Congress.

MAJOR UPDATE

DOD publications updated as part of the National Defense Authorization Act of 2017:

Department of Defense Directive 5132.03, "DOD Policy and Responsibilities Relating to Security Cooperation."

Department of Defense Instruction 5132.14, "Assessment, Monitoring, and Evaluation Policy for the Security Cooperation Enterprise."

Department of Defense Instruction 5132.15, "Implementation of the Security Cooperation Workforce Certification Program."

NEW REGS

Army publications created or updated in response to DOD changes:

Army Regulation 11-31, "Army Security Cooperation Policy."

Army Regulation 12-1, "Security Assistance, Training, and Export Policy."

Army Regulation 5-22, "The Army Force Modernization Proponent System."

The Defense Security Cooperation Agency's comprehensive and expanded mission, according to the agency's website, is "to advance U.S. defense and foreign policy interests by building the capacity of foreign partners in order to encourage and enable allies and partners to respond to shared challenges." Important aspects of the agency's mission are the tasks of managing and training the department's security cooperation workforce and demonstrating the return on program investments, all while continuing to perform its traditional core functions such as defense trade and arms transfer, institutional capability building and international education and training. Much of that mission passes to the military services for execution through a variety of new guidance like that for workforce certification.

CONVERGING EFFORTS

Understandably, the new DOD and Defense Security Cooperation Agency guidance resulted in the Army rethinking top-to-bottom how it engages with foreign partners and manages its workforce. Specifically, the materiel side of international engagement, the Army security assistance enterprise, led by DASA (DE&C), began to collaborate more closely with the operational forces headed by the Army's G-3/5/7. That synergistic effort resulted in the formulation of new Army guidance for the security cooperation enterprise that more closely aligns with "General Order 2020-01, Assignment of Functions and Responsibilities within Headquarters, Department of the Army," and updated critical guidance in security cooperation-related Army regulations.

This refreshed marriage of Army policy—operational security cooperation and security assistance—optimizes Congress' 2017 guidance by contributing to the service's combat readiness and the effectiveness of our security assistance efforts. Further, it ensures a whole-of-Army approach, which aligns plans that equip and train allies and foreign partners to better contribute to the Army Campaign Plan, the service's guidance for allocating resources and tasks to satisfy the DOD mandates.

The Army validated this new relationship with a number of significant administrative and strategy documents. In particular, those documents include the designation of the Army chief of operations and DASA (DE&C) as the Army's force modernization co-leads for security cooperation. These partners also co-developed the Army Strategy for Allies and Partners and three of its annexes: Implementation of Security Cooperation with Allies and Partners, the Global Prioritization Assessment and Country Specific Guidance.

NEW ROLES AT THE COMPONENTS

Implementation of this new partnership required a number of structural and personnel changes to optimize outcomes. Specifically, Army Regulation 11-31, "Army Security Cooperation Policy," makes the primary implementer of security cooperation the Army service component command, which implements the geographical combatant command's land-focused portion of the campaign plan. DASA (DE&C) placed security assistance strategists at each Army service component command (U.S. Army Pacific, U.S. Army Europe-Africa, U.S. Army Central, U.S. Army South and U.S. Army North) to assist them in incorporating security assistance activities.

The DASA (DE&C) strategist sits with the Army component's security cooperation staff to perform a number of functions. The strategist helps identify partner nations' materiel-related capability gaps from the perspective of the operational command and advises U.S. security cooperation officers at embassies and the foreign partner representatives with the early development process for foreign military sales cases. That assistance ensures accuracy and completeness of the letter of request leading to an expedited response from the Army's security assistance enterprise. The strategist also helps the Army component command draft land-specific significant security cooperation initiatives that support the geographical combatant commander's security cooperation priorities.

The benefit of assigning DASA (DE&C) strategists to component commands is multifold for the Army's security assistance enterprise. These strategists help develop component-specific assistance plans as part of the component's theater plans and synchronize those plans with foreign partner requirements. Further, those

TOP-LEVEL BRIEFING

Brig. Gen. Douglas Lowrey, second from left, then-commander of USASAC, and Command Sgt. Maj. Sean Rice, third from left, receives a briefing on tactical gear purchased through foreign military sales during a key leader engagement in central Colombia in April. (Photo by Richard Bumgardner, USASAC)

plans build-in a mechanism that allows for creative concepts of armaments cooperation to address shared security priorities such as expanding interoperability.

Another critical benefit of the DASA (DE&C) strategist's efforts is to coordinate, project and clarify foreign partners' security assistance training. Those efforts include geographical combatant command-approved partner training at Army schoolhouses, as well as the planning, coordination and deployment of training assistance teams to support foreign military sales cases. There are also the anticipated security assistance roles such as new equipment training assumed by security force assistance brigades now aligned with combatant commands and under the operational leadership of Army component commands.

The Army component's challenge to effectively employ the security force assistance brigade is to marry the unit with the appropriate authorities and funding streams aligned with strategic goals identified by the geographical combatant command's campaign plan.

CONCLUSION

Congress' inclusion of an entire chapter within Title 10 addressing security cooperation gives focus and legitimacy to DOD's important contributions to foreign partner security capabilities. Thanks to the refreshed marriage of the Army's international engagement entities of DASA (DE&C) and Army G-3/5/7, the Army's international engagements now have the unity of effort needed to deliver more capability into the hands of foreign partners and, best of all, results in more effective and interoperable U.S. Army coalition readiness.

For more information, go to ***https://www.dasadec.army.mil/****.*

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MICHAEL PRATER serves as the principal adviser to the DASA (DE&C) for global security assistance and armaments cooperation and brings to the position 17 years of defense-related experience. He is the primary interface with the Army staff regarding security assistance and armaments cooperation and contributes to Army strategies, campaign plans, policies and operational orders. He earned a bachelor's degree in business administration, focused on acquisition and contracts management from Strayer University.

INCREMENTAL ADVANCES

Product Manager Medium Caliber Ammunition leads collaboration for countering drone threats by upgrading platforms' armament systems.

by Kaitlyn Tani and Anthony Amoroso

As air threats like unmanned aerial systems (UAS) proliferate on the battlefield, the need for self-defense armaments on military vehicles becomes imperative—but with persistent constraints on weight and size. Small caliber systems, such as the .50-caliber M2 machine gun, have been the traditional solution for carrier vehicles. But enemies are increasingly exploiting small, fast, inexpensive drone—even a mass-produced hobby quadcopter can now be used to ascertain the position and size of a ground force—and small caliber ammunition can no longer keep up. Vehicles designed to carry Soldiers must maintain the ability to maneuver quickly across the battlefield. Larger caliber ammunition, while eminently effective, requires heavy weapon systems, which can limit speed and agility. Thus, medium caliber ammunition became the preferred means to counter the drone threat, and Product Manager Medium Caliber Ammunition (PM MC) is collaborating across the enterprise to provide enhanced capability.

In response to a joint operational needs statement for counter-drone capability and a direct requirement for self-defense, PM MC—under Project Manager Maneuver Ammunition Systems (PM MAS) and the Joint Program Executive Office for Armaments and Ammunition (JPEO A&A)—has reacted with an urgent materiel release strategy to fulfill the requirements for self-defense and an ammunition solution against drones. In collaboration with stakeholders, including PEO Missiles and Space and U.S. Army Training and Doctrine Command (TRADOC), the 30x113 mm ammunition was selected as the caliber of choice to provide lethality while not increasing vehicle weight significantly.

SAME WEAPON, NEW USE

For nearly four decades, the 30 mm M789 High Explosive Dual Purpose (HEDP) cartridge has been the tactical cartridge for the AH-64 Apache attack helicopter. Fired from an M230 chain gun at 625 rounds per minute, it provides a storm of air-to-ground fire. As the name implies, it also provides dual capability—lethality against ground enemy personnel targets and the ability to penetrate armored

BIG GUNS
JPEO A&A is leveraging and modernizing the 30x113 mm ammunition used on the Apache's M230 chain gun for the use on the XM914E1 chain gun on new ground platforms such as the Stryker M-SHORAD, pictured. The inset photo shows the XM914E1. (Photo by PEO Missiles and Space)

vehicles. If the Army's leading attack helicopter can achieve high speeds and maneuverability, and also engage with air and ground targets, what limits that capability to just air platforms?

Modernizing the Army does not always mean replacing old technology with new. Instead, it can mean repurposing proven technology for a new use. Take the M230 variant known as the XM914, which provides the capability for self-defense from ground threats as well as air defense, while allowing vehicles to maintain maneuverability. With more range than a 40 mm MK19 and more versatility than the .50-caliber M2, this lightweight weapon became the obvious choice for a host of new vehicles with similar missions—the Joint Light Tactical Vehicle; Mobile-Low, Slow, Small Unmanned Aerial Vehicle Integrated Defeat System; Mobile Short Range Air Defense; and the U.S. Marine Corps Marine Air Defense Integrated System. But traditional M789 HEDP ammunition fired from a ground platform risks collateral damage if targets are missed in ground-to-air engagements.

INCREMENTAL CHANGES

In a joint effort with U.S. Army Combat Capabilities Development Command Armaments Center (DEVCOM-AC) and industry, the M789 HEDP was modified to include a percussion primer and self-destruct fuze feature to provide dual-purpose capability while reducing the threat of collateral damage and unexploded ordnance. The added capability produced a new designation, the XM1198 HEDP – Self Destruct (SD). The self-destruct feature ensures that if projectiles miss their intended targets, they will detonate before hitting unintended targets near the ground. The self-destructing cartridge was developed, tested and approved for an urgent materiel release to support an initial 2021 fielding.

While the XM1198 HEDP-SD provides the hit-to-kill capability and achieves an initial incremental lethality for ground platforms against emerging threats, it has limited effectiveness against enemy

Enemies are increasingly exploiting small, fast, inexpensive UAS—even a mass-produced hobby quadcopter can now be used to ascertain the position and size of a ground force.

personnel and drone. PM MC continues to partner with DEVCOM-AC and industry to lead the path to smarter lethality. With advances in electronics miniaturization and advanced fuzing, the proximity fuzing capability, previously only found in large-caliber ammunition, has been implemented in the 30 mm round. The proximity fuze capability allows the round to detonate when it senses it is near a target, rather than requiring a direct hit.

For comparison, in basketball, when shooting free throws at a standard basketball hoop, even the best player will miss occasionally. But, what if the basketball hoop grew to the size of a hula hoop? You could probably hit nearly every shot, and even take a few steps back and still be just as good. The XM1211 High Explosive Proximity (HEP) cartridge is being developed to provide an increase in effective range, reducing the need for precision and making a larger lethal footprint—essentially increasing the size of the hoop so that every shot counts. The XM1211 HEP is currently being tested and validated for an urgent materiel release to support a projected 2022 fielding.

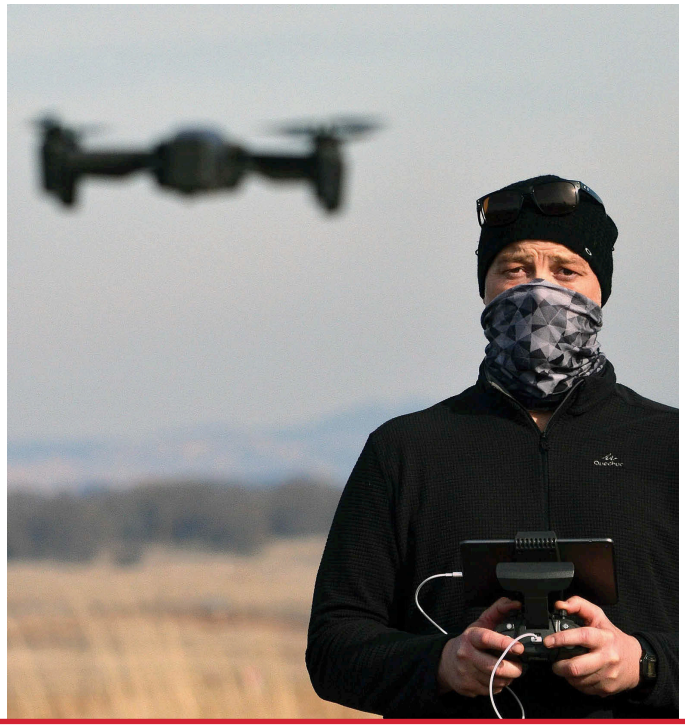
A LONG-TERM SOLUTION

While the urgent materiel releases have provided warfighters with the immediate capability through incremental development, PM MC strives to provide enduring, advanced 30 mm munitions for current and future ground platforms. The XM1198 HEDP-SD provides hit-to-kill drone capability while maintaining armor defeat, and XM1211 HEP provides proximity airburst against drones and personnel. The future generation of 30 mm ammunition will provide those capabilities and more.

Enter the Multi-Mode Proximity Airburst (MMPA) cartridge, currently being developed by PM MC to engage ground and air threats while significantly increasing lethality, with less ammunition, in a multidomain operational environment.

Imagine a Stryker vehicle commander taking fire from enemy troops in a protected position, while also in the direct line of fire of an enemy vehicle and with an enemy drone approaching quickly. He calls a fire mission to the gunner, who sets the weapon system to each of the different targets with the press of a button. He selects the MMPA proximity airburst mode, the weapon launches and the munition bursts within the proximity of the incoming air targets. Seconds later, it bursts above the hidden personnel targets and in point detonation with the vehicle threat. With minimal ammunition, the commander and crew are able to defeat three distinct threats. It's not science fiction. This 30 mm capability will change previous tactics of avoiding detection because of limited defense capability, and will save the Army from using expensive missile assets at shorter ranges, while providing enhanced ground force protection.

"It is essential to equip the joint warfighter with the immediate capability while developing a game-changing, multifunctional



DRONES 'R' US

As drones have become more advanced, less expensive and more widely available, DOD has shifted its approach to dealing with the threats they pose to troops in combat. MMPA helps to counter drone threats including swarms. (Photo by Joseph P. Bruton, U.S. Army Corps of Engineers)

solution to keep pace with an ever-changing threat on the battlefield," said Kevin Vo, deputy product manager for Medium Caliber Ammunition. MMPA enhances the ability to defend or engage against personnel, counter drone threats, including swarms, and counter materiel threats in cluttered environments through multimode programmability.

CONCLUSION

As the Army is adapting to fight in multidomain operations, its ammunition is being modernized to do the same. Any Apache pilot will agree that the 30x113 mm ammunition has provided decades of undeniable capability for our warfighter; and now, infantry Soldiers will have that capability as well. While developing the next-generation capability is the ultimate goal, incremental modernization is the agile approach for reducing the acquisition timeline and improving the efficiency, lethality and effectiveness of legacy systems to keep up with the pace of the threat. "Our future munitions need to be smart and interoperable in order to counter threats in multidomain operational

Modernizing the Army does not always mean replacing old technology with new.

ATTACK FROM ABOVE

The AH-64 Apache attack helicopter is an example of a fast and maneuverable vehicle that is also very lethal. The 30 mm M789 High Explosive Dual Purpose (HEDP) cartridge has been used successfully on the aircraft for nearly 40 years. (Photo by Sgt. Sarah D. Sangster, 25th Combat Aviation Brigade)

environments. The team's efforts in providing counter-UAS munition capability is a great stepping stone on the path to munition and Army modernization," said Lt. Col. Paul Santamaria, product manager for Medium Caliber Ammunition.

This effort can only be successful through collaboration across the enterprise so that we all reach the same objective—synchronization with TRADOC for requirements development, DEVCOM-AC for research and development, Army Test and Evaluation Center for test and evaluation, acquisition through different program executive offices, industry for manufacturing and development, and Joint Munition Command for materiel release approval. This is the winning combination to provide the right capabilities to the warfighter at the right time.

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ANTHONY AMOROSO works within JPEO A&A for PM-MAS as a matrixed employee from DEVCOM-AC as the project officer for 30 mm counter-unmanned aerial systems. He has worked at Picatinny Arsenal in support of the Army for 17 years. He holds a B.S. in mechanical engineering from Penn State University.

VERSATILITY WANTED

The M230 variant known as XM914 provides the capability for self-defense from ground threats as well as air defense, while allowing vehicles to maintain maneuverability. It is the "weapon of choice" for vehicles like the M-SHORAD. (Photo by Georgios Moumoulidis, Training Support Activity Europe)

CHAIN OF EVENTS

JPEO A&A is modernizing by making existing munitions better. The .50-caliber machine gun was too light for the task of bringing down unmanned aerial systems. It has adapted the Apache's chain gun to be truck mounted, and is working on new ammunition that will destroy unmanned systems. (Photo by General Dynamics)

JAMES VANATTA

COMMAND/ORGANIZATION: Joint Program Executive Office for Armaments and Ammunition, Project Director Joint Bombs

TITLE: Program analyst

YEARS OF SERVICE IN WORKFORCE: 13 years

DAWIA CERTIFICATIONS: Level III in business – cost estimating and in business – financial management; Level I in program management

EDUCATION: B.A. in general studies, Temple University

TOOLS OF THE TRADE

James Vanatta doesn't use a pipe wrench at work anymore, but he still uses the life lessons he learned years ago as a plumber's apprentice in northeast Pennsylvania. Show up on time, be honest, help out your team, take responsibility and understand your role in the larger project. If the plumbing isn't finished on time, then the entire project suffers—a surprisingly accurate parallel to Army acquisition.

As a newly minted college graduate, Vanatta found himself at an unexpected crossroads. He had planned to attend law school after finishing his bachelor's degree, but the job market was not favorable and he didn't think it was the right time to take on such a large amount of debt. So he went back to what he knew—construction. It was the family business, after all. His grandfather had moved from New York to Pennsylvania to start his home building business decades earlier. Vanatta worked as a plumber's apprentice for about two years before he decided to explore job opportunities at Picatinny Arsenal, New Jersey. "My neighbor worked at Picatinny, and my mother-in-law as well. I didn't know anything about government jobs until I sat down and spoke with my neighbor and he told me what he did. I've always been interested in business, so I decided to give it a shot. I put my resume in, interviewed, and I got lucky, honestly."

Today, Vanatta is a program analyst for the Joint Bombs project office within the Joint Program Executive Office for Armaments and Ammunition—an office that was just starting out when he joined the team on a rotational assignment. "I went over there, not knowing that they were literally 12 months into inception. They were a brand new organization and I got thrown into the fire immediately. There were only four or five of us—it was kind of like a new startup company, that's the best way I can describe it." Vanatta said the experience of joining a brand new organization was unique in many ways. "When you're starting an organization from the ground up, you have to be involved in all the facets of daily operations. With such a small staff, if somebody's out, the task is going to fall to you. You had to come in with a self-starter attitude. You had to come in wanting to learn, to accept pressure and responsibility, or the organization would suffer."

If you think that scenario sounds a bit like working in residential construction, you're not alone. "There are definitely some similarities," Vanatta said. "If your material doesn't show up on the job one day, you can miss your inspection and then the whole house is going to sit for a month. Our team is that small, where if one group doesn't show up, we could be set back for a month."

The team at the Joint Bombs project office has grown since the early days, and now includes 20 full-time personnel dedicated to Army, Navy and Air Force products. "We're part of the SMCA, the Single Manager for Conventional Ammunition. We provide acquisition management of transitioned bombs and Navy gun ammunition and focus on industrial base planning and integration. We have

FIRE AWAY

James Vanatta has been with the Joint Bombs Project Office since it was first created. Since then, the office has grown, and now includes 20 personnel dedicated to Army, Air Force and Navy products—like the ammunition for the MK45 5-inch gun aboard the USS Benfold. (Photo by U.S. Navy Mass Communication Specialist 2nd Class Deanna C. Gonzales)

"The more honest we can be about our workload and our stresses, the more easily we can navigate those waters and work together effectively to achieve our common goal."

the responsibility of coordinating with the military services and OSD in matters relating to their requirements, planning, programming, budgeting and funding for conventional ammunition programs that relate to the SMCA mission. It's really advantageous for the other services, as they don't have to allocate additional funding to support the SMCA and they get all their products successfully built."

And though the work can be challenging, Vanatta said it's a job he truly enjoys. "In the beginning, I would say that the best part of my job was getting the responsibility and the challenge that I was looking for. That's the environment where I thrive. Today, the best part is when I see all the hard work that we did in the beginning, and it starts to come to fruition."

Working on a joint team involves a lot of coordination, and Vanatta said effective communication is the key to success in that environment. "Besides being hardworking and devoted, I'm looking for honesty. We're all under different commands, we all have different stresses, different management, different expectations," so it's important to be honest about the environment that you're in. "The more honest we can be about our workload and our stresses, the more easily we can navigate those waters and work together effectively to achieve our common goal," he said.

Vanatta is happy to give advice to others who are just beginning their careers in acquisition. "Never stop asking questions, and never feel you can't ask questions. Coming into an organization is a brand new adventure and there will always be aspects of the position that are challenging. No one expects you to know everything on day one," he said. "Another piece of advice is to take advantage of every opportunity that interests you. If the plan is to have a long career, you don't want to retire with regrets."

Over the course of his career, Vanatta said he has learned the importance of looking out for his teammates. "People over programs," he said. "I've been fortunate to have supervisors and managers who have taught me that no matter how hard people work, if they aren't happy and fulfilled, the programs will never be as successful as they could be." He encourages others to pay attention to their coworkers, make time for conversations, ensure workloads are manageable and tell everyone how much they are appreciated. In construction and in acquisition, those so-called "soft skills" are the tools of the trade.

—ELLEN SUMMEY

ENABLING IMPARTIALITY

Not every competitor is a perfect 10. Tools like Valid Eval allow judges to base their scores on specific, measurable criteria, for more accurate results. (Image by Getty Images)

CONFIDENCE *BOOST*

The Army gets help from a small business to improve decision-making for technology solutions.

by Stephanie Price and Anna Volkwine

With a winning partnership between the Army and an innovative small business, DOD has a low-barrier, streamlined approach to identify transformative technology solutions. That small business is Valid Eval, and its evaluation tool has given the Army a simple-to-use process to get technological innovations into the hands of Soldiers with greater confidence and greater speed.

In a typical evaluation process for Army prize competitions and proposal reviews, a judge could expect to sit in deliberation for two to three days straight, discussing and negotiating with peers about which technologies could be the next innovations to ensure mission readiness for Soldiers. By partnering with Valid Eval, it not only simplified the process, but it implemented a more efficient, reliable way to make these funding decisions for DOD.

HOW IT BEGAN

Adam Rentschler, co-founder and CEO of Valid Eval, said he's always been bothered by how innovation is evaluated.

"Everything is driven by experts' gut instincts. For those being judged, the process is opaque, mysterious and without any feedback loops other than a 'no thanks,' " Rentschler said. "There had to be a better way."

Rentschler was complaining about this problem to a friend, Todd Reimer, a Ph.D. learning scientist, who began to detail a scientific approach to evaluating complex performances like innovation pitches. Rentschler, Reimer and Kent Hollrah, a user

XTech and SBIR are willing to take some smart risks and do things differently.

experience expert, joined forces. Together, they developed a prototype for a secure platform to manage complex group evaluations with transparency, efficiency and accountability at the forefront. From there, Valid Eval was born. "One of the things that makes our tool different is that we deliver a consumer-grade user experience to expert evaluators," Rentschler said.

A secure software-as-a-service platform, Valid Eval is an online evaluation system that helps organizations make and defend tough decisions. It can work on virtually any scale, so companies or organizations can involve as many applicants, experts or judges as they need, while providing defensible, data-driven results and robust reporting tools to help them monitor and measure performance.

In 2018, Rentschler reunited with a former business colleague who worked for the U.S. Air Force and required a tool to provide more robust feedback to companies not selected for its business accelerator competition, the Hyperspace Challenge. One of the biggest areas of improvement Rentschler wanted to address with his tool was the lack of valuable feedback provided to the innovation community. Valid Eval was able to provide the Air Force just that—clear-cut and applicable feedback, delivered in a neatly packaged and easy-to-read format. And now that the Air Force's front door was open, Valid Eval quickly learned that there were many more opportunities for it to continue doing business across various DOD agencies that are all responsible for having efficient, effective and transparent acquisition processes.

GOING GREEN

Valid Eval formed a partnership with the Army in 2019, streamlining the evaluation process for xTechSearch 2, the second xTechSearch competition. This was only the first step in a long-term relationship with the Army and a clear demonstration of how small businesses can provide large-scale solutions for the Army enterprise.

Sponsored by the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), the xTechSearch competition was launched in 2018 to identify and award transformative technology solutions, from small, non-defense businesses, to sustain Army priorities and fill critical mission gaps. Through xTechSearch, winners have the opportunity to earn significant cash prizes, to secure potential follow-on contracts and agreements with the Army, and to find unique opportunities to engage with key defense stakeholders through events, mentoring and educational programming.

To determine which businesses can most impact Soldier readiness, each competing organization goes through an extensive judging process. For the xTech Program's first prize competition, now known as xTechSearch 1, the Army used a government-developed tool that suffered from a lack of recorded feedback and a difficult user experience.

To simplify the review and submission process for both evaluators and participants, the xTech Program adopted the

TEST RUN

U.S. Air Force Lt. Col. Richard Tanner, left, 18th Wing vice commander, reviews submissions using the Valid Eval system in 2019 at Kadena Air Base, Japan. The Kadena group was the first Air Force "spark cell" innovation group to use the Valid Eval system. (Photo by Senior Airman Michael Jones, 18th Wing Public Affairs)

Valid Eval tool for the second iteration, xTechSearch 2, which required more than 130 expert judges to review more than 150 applicants. Over the past three years, the xTech Program has grown to 500 judges for xTechSearch 5, which launched in February 2020 and announced the grand-prize winner in September 2021.

"We've made efforts to make this easy and intuitive," Rentschler said. "Judges are having fun with the process—that helps a great deal."

This technique arms evaluators and decision-makers with the knowledge to demonstrate mission alignment with the Army and other potential clients. Understanding and meeting government needs are critical components of a business's success, and providing an easy path to do so propels these businesses to the front of the line when it comes to awarding cash prizes and funding.

"We want to be able to start solicitations as needs emerge from Army senior leaders, and get decisions made on a rapid cycle, rather than the traditional process that can take 12, 18 or 24 months," said Dr. Matt Willis, director of Army Applied Small Business Innovation Research (SBIR) and Army Prize Competitions in the Office of the Deputy Assistant Secretary of the Army for Research and Technology (DASA (R&T)).

With Valid Eval, the biggest advantage is the elimination of lag time. Instead of manually scoring and tallying results, then filtering them through to each competitor, automation helps to select the best technologies to support Army research and development and acquisitions programs. The sooner new technology can be introduced to Soldiers, the better their performance and reliability, which can ultimately be lifesaving on the front lines.

TOOLING AROUND
Maj. Billy Thomas, left, and Maj. Ryan Fillis use the Valid Eval tool in the xTechSearch 4 competition to evaluate, score and deliberate on science and technology innovations in January 2020. (Photo by xTechSearch)

To date, xTech has used Valid Eval as the judging and scoring mechanism in more than 15 competitions and counting. Valid Eval will continue to be a major player in making these research and development and acquisitions decisions better and faster, as well as highlighting a meaningful small-business approach to Army problems.

ANOTHER ARMY DOOR OPENS

Valid Eval is helping the Army make the right technology acquisition decisions faster while meeting critical DOD needs through a partnership with the Army Applied Small Business Innovation Research (SBIR) Program started in April 2021. The Army Applied SBIR Program sponsors research and development for small businesses to provide innovative solutions to meet urgent Army modernization needs. The program also connects Soldiers and other subject matter experts with small businesses to provide insight and mentorship through the Army research and development ecosystem.

To capitalize on small business innovation and respond to the most urgent Army capability needs, the Army Applied SBIR Program issues contract opportunities on an ad hoc, rolling basis to address needs as they emerge—a switch from the legacy SBIR process of releasing topics via predetermined announcements issued at the DOD level. Valid Eval supports this effort by helping Army Applied SBIR make fast,

TIPPING THE SCALE
No two judging criteria are the same, and some should be weighted more heavily than others. Valid Eval helps xTechSearch judges make data-driven decisions about very complex issues and processes. (Image by Getty Images)

reliable decisions that are in the best interest of the Army.

"We have a tremendous amount of interest in the solicitations we put out on the street, and we're trying to bring innovation back to the SBIR program," said Willis, who has led the Army Applied SBIR Program for nearly two years. "We want to be expeditious in our approach by scouting the tech landscape to determine which technologies respond to not only the Army's needs, but small business needs as well."

The program awards topics that clearly align with the Army's modernization priorities as well as DOD's key science and technology areas, such as artificial intelligence and machine learning, and advanced materials and communication technologies, which dictate the Army's investment decisions. To make this happen, the program is shifting from a passive, topic-driven approach to the newly created transition broker team construct, which manages a centralized portfolio and synchronizes among stakeholders to identify the best emerging technical solutions while integrating all program activities.

"There had to be a better way."

A crucial step in determining which companies meet these urgent Army priorities is providing unbiased decisions as quickly as possible and giving transparent feedback. Even if companies don't receive an award, they can understand how they can pivot their proposal or technology to be more viable in the future.

Valid Eval was awarded a new task order on its Phase III indefinite duration, indefinite quantity SBIR contract with the General Services Administration. It also won an Air Force Phase I SBIR in 2018 and secured a Phase II from the Air Force in early 2019.

Valid Eval is now the primary tool for evaluating proposals that small businesses submit to the Army Applied SBIR Program. It allows the program to set clear expectations for how a company will be evaluated, collate responses and reviews from experts, give an unbiased assessment, and provide data-backed recommendations to Army leaders on the best proposals.

"We're empowering our program managers to make decisions under the best interest of the Army, and have those decisions be supported by a data-driven tool," Willis said.

CONCLUSION

With technology constantly evolving, the Army must always progress and improve in order to deter and defeat adversaries. Identifying technologies, providing funding, prototyping, and implementing solutions can be a long process, so time-saving tools are a must—and Valid Eval hits the mark for efficiency.

"The shared mission is to make innovation better for the DOD," Rentschler said. "The really cool thing about our partnership with xTech and SBIR is that they are willing to take some smart risks and do things differently than they've done in the past, which is why collaboration is key to these relationships."

Collaboration with small businesses like Valid Eval, along with Army prize competitions and other contracting mechanisms, demonstrate how distinct entities can work together. The goal is to create innovative processes to bring trust, efficiency and improved performance to the materiel development process and drive research and development and acquisition programs to find the best technology and partners for government programs.

"We now have a process that makes acquisition better for the DOD—and that's thanks to a partnership between the federal government and a small business," Willis said. "These crucial partnerships not only foster, strengthen and encourage the role of small businesses, but also help us modernize our world-class military and transition life-saving technology into the hands of our Soldiers."

For more information, go to ***https://www.armysbir.army.mil/.***

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ONE MUNITION, *MULTIPLE TARGETS*

Project Manager Close Combat Systems takes the next-generation shoulder-launched munition in a new direction.

by Ken Schulters, Mark E. Bailey, Michael Franz and Styles E. Underwood Jr.

As early as World War I, commanders faced a dilemma when deciding which shoulder-launched munitions (SLMs) to carry into battle: anti-armor, anti-structure, or both. This dilemma directly affects force load-out—the equipment a group of Soldiers (company, platoon, squad or fire team) must elect to carry when they deploy—Soldier survivability and, ultimately, mission success. Additionally, the current, multiple shoulder-launched munition configurations entail expanded training, logistics, life cycle management and cost requirements. In alignment with the Army modernization priority for Soldier lethality, Project Manager Close Combat Systems (PM CCS) within the Joint Program Executive Office for Armaments and Ammunition, at Picatinny Arsenal, New Jersey, has been charged with eliminating this dilemma by providing a new shoulder-launched munition capable of engaging multiple target categories.

An integral part of the PM CCS portfolio, such munitions have been the dominant effective weapon against armored vehicles and fortified structures used by the U. S. Army, Marine Corps and special forces. These munitions are designed to defeat or incapacitate adversaries within earth and timber bunkers, adobe, double reinforced concrete, triple brick wall structures, and light armored vehicles. Although the shoulder-launched munition has proven to be a weapon of choice, there is a major challenge that Soldiers face—no single shoulder-launched munition configuration is capable against all of these target sets. The solution—the XM919 Individual Assault Munition—will be lighter, able to be fired from within an enclosure, and capable of defeating each of the target sets. It will contribute to survivability by enabling the Soldier to engage targets from protected positions without being exposed to enemy fires and effects. This disposable shoulder-launched munition will combine the capabilities and replace the M72 Light Anti-Armor Weapon, M136 AT4 Light Anti-Tank Weapon, M136A1 AT4 Confined Space, and M141 Bunker Defeat Munition in the arsenal.

In addition to addressing the technical challenges, PM CCS will address the underlying acquisition

BOOM BUNKER

An earth-and-timber bunker at the Redstone Test Center in Alabama before the SLM detonation, left, and after the detonation, right. Previous iterations of shoulder-launched munitions can only defeat one or two types of targets, a limitation PM CCS wants to overcome. (Photo by Redstone Test Center)

process. Historically, shoulder-launched munitions have been procured via sole-source contracts to meet specific, narrow mission requirements. This approach has resulted in limited competition, diminished government data rights, and multiple shoulder-launched munitions in the Army's inventory, each with unique logistics and training requirements. PM CCS will pursue full and open competition for the XM919 production contract with government data rights to support future competitive procurements.

THE CHALLENGE

The infantry warfighter community continues to request enhancements to improve Soldier survivability while increasing combat effectiveness and lethality. Lt. Col. Christopher Kennedy, chief of the Lethality Branch, Maneuver-Capabilities Development and Integration Directorate, is responsible for the evolution and integration of shoulder-launched munition capabilities to meet this challenge. "The current suite of shoulder-launched munitions are optimized for specific target sets. While this served its purpose in the past, the future fight requires the ability to defeat our adversaries across a wide spectrum of environments with one munition," he said.

How can the U.S. Army fill the capability gap of a single shoulder-launched munition used to defeat multiple targets, and thereby eliminate the commander's dilemma of having to choose the correct shoulder-launched munition to address the potential threat? For example, the M141 Bunker Defeat Munition provides Soldiers with the capability to defeat the protective cover provided by masonry structures, earth-and-timber bunkers, and field fortifications. However, they can only be fired in an open environment, such as trench lines or streets, exposing Soldiers to enemy fire.

Conversely, the M136A1 AT4 Confined Space provides Soldiers the capability to only defeat light armored platforms but can be safely fired from within an enclosure or covered and concealed position, eliminating Soldier-to-enemy fire.

However, the XM919 Individual Assault Munition must provide a capability to penetrate and deliver incapacitating effects behind standard building walls (triple brick, reinforced concrete and adobe), lightly armored vehicles, and field fortification or bunker fighting positions. The munition must also support the close fight in urban and complex terrains (fired from within an enclosure). Ultimately, it needs to be lightweight, compact, highly lethal, easy to safely operate and readily transported with Army forces anywhere on the globe.

PM CCS is reducing the commander's burden of having to decide which shoulder-launched munitions to carry into battle by providing a single fully integrated munition to address potential threats.

In addition to the technical challenges, shoulder-launched munitions have been procured through sole-source contracts with limited to no competition and a lack of data rights, which puts the government at a disadvantage from a negotiation perspective. This significantly impacts the munition's unit cost for both the tactical munition and the training devices. The question is, how does the government shift the paradigm from sole source to a competitive procurement and still acquire a technically superior munition system (tactical and trainer) for a reasonable price?

THE APPROACH

For years if not centuries, target characteristics such as earth and timber, concrete and brick have not changed. However, a single munition capable of defeating these targets has not been developed or identified. Industry's approach has always been to meet the specific needs of the Soldiers rather than developing a more versatile weapon. In line with the Army Futures Command philosophy of creating "a continuous transformation of Army modernization in order to provide future warfighters with the concepts, capabilities and organizational structures they need to dominate a future battlefield," PM CCS engaged the technical community, industry and the user community through requirement and technology development, industry capability assessments and open dialogues.

To best influence the requirements for a single shoulder-launched munition and modernize the state of technology, PM CCS approached the solution from two directions. First, the U.S. Army Combat Capabilities Development Command Armaments Center (DEVCOM-AC) at Picatinny Arsenal was tasked to develop key elements of the weapon to close the capability gaps at the munition level. A military operations in urban terrain Army technology objective was funded with the goal of integrating component technologies into a technology readiness level (TRL) 6 multipurpose shoulder-launched munition. (TRL 6 is a system model or prototype demonstration in a relevant environment.)

The goal was to develop a system weighing less than 15 pounds with fire-from-enclosure capability. The objective was to achieve the lethality capabilities identified in the Individual Assault Munition's capabilities development document. While this effort primarily focused on integration, it significantly leveraged 10 years of warhead development. The overall effort enabled the government to significantly improve its shoulder-launched munitions design competency, launch capability, target effects and system optimization modeling. The urban combat Army technology objective effort resulted in a TRL-6 government-owned technical data package, proving that technologies exist to achieve the requirements with a single munition.

Second, PM CCS worked with the user community and U.S. Army Maneuver Capabilities Development and Integration Directorate to develop an extensive Individual Assault Munition capability development document. This integrates the combined capabilities of several configurations with the need for Soldiers to carry just one into the field. Added benefits to this approach include Soldiers training on one configuration, making inventory and logistics significantly easier to manage.

"Our innovative acquisition approach to pursue mature technologies eliminates costly development efforts, reduces overall life cycle costs, and rapidly fields improved capabilities to our joint warfighter," said Col. Russell Hoff, project manager for CCS. PM CCS found a balanced approach to the XM919 Individual Assault Munition program that eliminates government development costs and schedule. The government technical experts are working

INSIDE AND OUT

The XM919 Individual Assault Munition will be able to be fired from within an enclosure and capable of defeating multiple target sets. Previous shoulder-launched munitions could only defeat one target set and had to be fired under specific conditions—such as out in the open. (Photo courtesy of PM CCS)

with industry to meet our Soldiers' needs to rapidly produce a more versatile and effective munition.

MOVING OUT

Based on the results of the urban combat technology objective, coupled with an approved capability development document, PM CCS is in the process of acquiring a mature, production-ready XM919 Individual Assault Munition candidate from industry. The program is proceeding with a multipronged approach in order to best meet the Soldier's requirements while being mindful of costs and schedule. In 2020, PM CCS performed market research to determine the maturity of the shoulder-launched munition industry as compared with the Individual Assault Munition's capability development document requirements. Based on the results, three mature munition configurations were procured for assessment and user feedback through Soldier touch points such as user jury events. These assessments are not intended to select a final candidate, but to establish an industry technology maturity baseline as it relates to the capability development document requirements.

Because of pandemic constraints, PM CCS conducted an XM919 Individual Assault Munition virtual industry day in the third quarter of fiscal year 2021. The event was successful in providing

guidance on the government's acquisition strategy and insight for industry to focus their internal research and development investments toward addressing the Individual Assault Munition requirements. The government also offered the technical data package developed under the urban combat effort for industry to leverage in part or its entirety. This event was a critical first step to generate industry interest in providing a solution.

A second industry day is planned for the third quarter of fiscal year 2022 to provide program and requirement updates before the XM919 Individual Assault Munition full and open production contract request for proposals release. It is the program's intent to acquire the XM919 Individual Assault Munition data rights. This will reduce the government's dependency on a single contractor and allow for more flexibility in modifying the munition to meet future requirements. This is a major paradigm shift in the history of shoulder-launched munition procurements.

CONCLUSION

The XM919 Individual Assault Munition will provide a modernized single munition with a multitarget capability to penetrate and deliver incapacitating effects behind standard building walls, field fortification and bunker fighting positions, and lightly armored vehicles. The lightweight, compact shoulder-launched munition will provide a highly lethal capability delivered in a safe, easy to operate, and readily transportable weapon configuration with Army forces to anywhere on the globe. Finally, it will significantly reduce the overall shoulder-launched munition cost, training, logistics and life cycle management requirements.

PM CCS is reducing the commander's burden of having to decide which shoulder-launched munitions to carry into battle by providing a single fully integrated munition to address potential threats. The paradigm shift of openly competing a shoulder-launched munition contract in lieu of a sole-source arrangement provides the government more flexibility to negotiate better pricing. Additionally, the government strategy of acquiring a mature shoulder-launched munition system eliminates the development cost and provides this capability to the Soldier more quickly.

"Our innovative acquisition approach to pursue mature technologies eliminates costly development efforts, reduces overall life cycle costs, and rapidly fields improved capabilities to our joint warfighter."

For more information, contact Ken Schulters, XM919 project officer at ***ken.r.schulters.civ@mail.mil*** *or go to the PM CCS website at* ***https://go.usa.gov/xFrE2****.*

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MARK E. BAILEY is a Booz Allen Hamilton contractor supporting PM CCS. He has more than 33 years of civil service with the U.S. Navy, supporting RDT&E, acquisition and program management on torpedoes, surface ship torpedo defense, rolling airframe missile systems, counter narco-terrorism, and hyper velocity projectiles. He has a master's degree in public affairs from Indiana University and a B.S. in electrical engineering from the South Dakota School of Mines and Technology, and was DAWIA Level III test and evaluation certified.

MICHAEL FRANZ is a DEVCOM Armaments Center mechanical engineer supporting shoulder-launched munitions. He has more than 19 years of civil service with the U.S. Army, supporting RDT&E, acquisition and technical management on shoulder-launched munitions and their major subsystems. He has a B.S. in mechanical engineering from the New Jersey Institute of Technology, is Level III certified in engineering, Level I certified in program management, and is a member of the Army Acquisition Corps.

STYLES E. UNDERWOOD JR., Nemean Solutions LLC, is the senior capabilities development analyst and expert for shoulder-launched munitions. He has more than 41 years of military experience with combat requirements development, training development, doctrine coordination and new equipment training on both heavy and medium anti-armor missile systems and shoulder-fired rockets. He has a Bachelor of Applied Science in resource and technology management from Troy University.

NETWORK TEST
Sgt. 1st Class Joshua D. Geren tests the Squad Area Network at Joint Base McGuire-Dix-Lakehurst in New Jersey in September 2020. The Squad Area Network is a part of the C5ISR Center's nontraditional waveforms effort, dedicated to improving communications capabilities in electronic warfare operating environments. (Photo by Jasmyne Douglas, C5ISR Center)

ALL TOGETHER

Director discusses C5ISR Center reorganization that aims to eliminate stovepipes and enable decision dominance.

by Joseph Welch

The Army is traditionally organized by function. A Soldier is assigned a military occupational specialty that falls under a specific branch (e.g., infantry branch or engineering branch). Each branch has its own schoolhouses and its own centers of excellence. Similarly, from an acquisition perspective, we have program executive offices structured to support different environments.

However, as we look to the future and what it will take for a multidomain operations-ready force to execute the Joint All-Domain Command and Control (JADC2) framework—DOD's effort to combine sensor information from all of the military services into a single network—we must be mindful of functional silos and stovepipes. Our success in multidomain operations depends upon developing an integrated set of capabilities working together and enabling decision-making at greater speeds than we've ever had before to beat the adversary's decision and action cycles.

TERMINAL TROUBLESHOOTING
C5ISR Center engineer Richard Hoffmann collaborates with a Soldier from the 51st Expeditionary Signal Battalion to troubleshoot a multi-band satellite terminal during a field exercise at White Sands Missile Range in New Mexico. (Photo by U.S. Army)

Decision dominance requires the ability to sense, detect, locate, navigate, process, share, display, automate, protect, communicate and target—it's a lot, and it all needs to work together.

The core capabilities of the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center underpin this concept. To ensure we are postured for success, we've taken steps to reduce our functional stovepipes and optimize our contribution to multidomain operations and the Army's vision for the JADC2 concept. Most notably, we implemented a reorganization that is effective Oct. 1.

As a component of Army Futures Command's Combat Capabilities Development Command (DEVCOM), we provide research, development, engineering and analytical expertise, expediting the delivery of near-, mid- and far-term C5ISR capabilities that allow Soldiers to be more lethal on the battlefield, today and tomorrow.

We support all six Army modernization priorities and all eight Army cross-functional teams, so you've almost certainly interacted with technology and capabilities we influenced, whether we delivered it, prototyped it, integrated it or provided the subject matter expertise to support cross-functional teams and program executive offices in their modernization efforts and acquisitions.

A PROUD PAST

Those contributions came out of our six legacy directorates, which made important contributions to Soldiers and joint service partners for decades.

From developing first-generation night vision devices during the Vietnam War to pioneering aided target recognition today, our **Night Vision and Electronic Sensors Directorate** enabled countless U.S. troops to "own the night" and achieve battlefield overmatch. Previously known as Night Vision Labs, the directorate was instrumental in developing the forward-looking infrared program, producing multiple generations of high-performance thermal imaging systems for targeting and situational awareness. It also provided a variety of sensor technologies to locate and neutralize improvised explosive devices and mines, and to support humanitarian demining initiatives.

Our **Intelligence and Information Warfare Directorate** has been a national leader in cyber operations, electronic warfare, signals intelligence, radar and information systems and processing technologies. For the past 20 years, it provided rapid support to Operations Enduring Freedom and Iraqi Freedom, including with the Counter Radio-Controlled Improvised Explosive

REALITY CHECK
Soldiers participates in a perception testing event held by C5ISR Center experimental psychologists and scientists at Fort Belvoir, Virginia, in March. Soldiers engaged in simulated and virtual reality activities, testing various capabilities early in the development cycle. (Photo by Kaitlin Newman, C5ISR Center)

Device Electronic Warfare (CREW) Duke Version 3, the Vigilant Pursuit multi-intelligence system and the Warlock countermeasure protection system.

Our **Space and Terrestrial Communications Directorate** made numerous contributions to support and enable the network. Among these were the research and development leading to the first generation of military mesh network radio communications systems, all the way up to the next-generation Warrior Robust Enhanced Network (WREN) waveform, which significantly improves communications range, network scalability, spectrum supportability, secure communications and resiliency.

Our **Command, Power and Integration Directorate** (CPID) provided a unique set of core competencies in mission command, operational energy and positioning, navigation and timing to develop, integrate and deliver innovative technology solutions. It developed the Distributed Analysis and Visualization Infrastructure for C4I, known as DaVinci, which provided a scalable digital command and control system with battle planning and execution monitoring functions. DaVinci-based products were used in Operation Iraqi Freedom and ultimately replaced the battle planning and visualization system used by III Corps, 4th Infantry Division, XVIII Airborne Corps and United States Forces Korea. CPID also played a key role in maturing a chip-scale atomic clock to support highly accurate location and battlefield situational awareness for weapons, weapon systems and dismounted Soldiers in the temporary absence of GPS.

Finally, our **Product Realization Systems Engineering and Quality Assurance Directorate** (PRD) and our **Software Engineering Directorate** (SED) both provided key life cycle engineering and sustainment services to the C5ISR community, including program executive offices and life cycle management commands. PRD provided technical support and leadership throughout all phases of the product life cycle and SED conceptualized, developed and supported the fielding and sustainment of software products, services and technologies.

While these directorates had many successes, they were largely function-focused within specific technology areas and lacked the cross-collaboration necessary to provide integrated support to multidomain operations and JADC2. It was evident that a model focused on S&T portfolio integration—mirroring the framework seen elsewhere in DEVCOM—would better enable internal and external collaboration, broaden our system-of-systems engineering approach to problem solving, and strengthen our ability to address more complex challenges and opportunities.

C5ISR Center missions are now streamlined into two core directorates, both headed by a member of the Senior Executive Service. The Research and Technology Integration Directorate is led by Dr.

There's never been a better time to align to the future.

EXPERIMENTAL WARFARE
A C5ISR Center engineer trains Soldiers from I Corps on emerging electronic warfare capabilities during a field-based experiment at Joint Base McGuire-Dix-Lakehurst in New Jersey. (Photo by Edric Thompson, C5ISR Center)

Donald Reago and the Engineering and Systems Integration Directorate is led by Michael Monteleone.

RESEARCH AND TECHNOLOGY INTEGRATION

All science and technology (S&T) portfolios fall under the Research and Technology Integration Directorate (RTI). RTI's priority is to formulate effective S&T programs that are innovative, responsive to customer needs, structured to produce outputs that we can give to Soldiers for experimentation and refinement, and designed to produce technologies that our acquisition partners can easily transition and integrate.

RTI will improve S&T accountability and enable a strong management framework, with one leader responsible for project oversight, adjustments to meet emerging requirements, technology transition and delivery, and technical and financial planning, programming and execution. It also brings together many complementary areas of applied research and advanced technology development previously spread across the center.

For example, under RTI we've combined the development of advanced sensors for ground and Soldier platforms with position, navigation and timing capabilities to address emerging sensor-to-shooter requirements in the JADC2 environment. To improve our contributions to the Army's cyber strategy, we've consolidated our efforts supporting offensive and defensive cyber operations. We also combined our teams working within the radio frequency spectrum to leverage their common expertise, and better support both blue (friendly) force communications and red (enemy) force sense, jam and defeat capabilities. RTI now hosts our research efforts in power and energy storage, generation and distribution capabilities alongside our S&T projects that rely on these advancements, and it consolidates our modeling and simulation environments to support all elements of the center's mission via comprehensive, high-fidelity system representations that enable rapid analysis, prototyping and experimentation. Finally, the RTI directorate hosts our world-class talent center for advanced image and signal processing technologies as well as artificial intelligence and machine learning across our entire domain space.

ENGINEERING AND SYSTEMS INTEGRATION

The Engineering and Systems Integration (ESI) Directorate is streamlining and synchronizing our lab- and field-based experimentation and life cycle engineering. This synergy, which runs from basic research through technology maturation and post-production support, provides an improved systems engineering approach to capability development, production and sustainment. The directorate will also help to clearly define and shape the way we experiment, collect data and inform stakeholders. The combined approach allows stakeholders to make informed decisions that best support Army modernization priorities.

ESI will enhance experimentation by bringing together all lab- and field-based risk reduction, prototyping and platform integration capabilities under a single directorate. This will better inform engineering designs across the S&T and acquisition communities and demonstrate how emerging technologies will actually perform in relevant, threat-based operational environments. ESI will also help the Army to holistically understand the nuances of delivering and validating data across a network that is joint and interoperable, while exploring how to manage and securely transmit trustworthy data as it traverses the Army's network in a

JADC2 environment. ESI optimizes our life cycle engineering and sustainment functions across all elements of C5ISR, bridging S&T and fielded systems.

KEYS TO SUCCESS

The center's new structure provides the integrated approach necessary to achieve decision dominance while standardizing key processes and streamlining cross-organizational efforts in support of our S&T and lifecycle engineering missions.

Our support for the Integrated Visual Augmentation System (IVAS) is a good example of how this integrated concept is already working. Not only are we addressing the sensors and augmented reality components, we are also developing a conformable, longer-running battery to power them. Passing that sensor data will be important, so we're using our lab- and field-based experimentation venues to evaluate industry radios being considered for the IVAS Soldier network. Finally, we want our Soldiers to maintain situational awareness capabilities whether mounted or dismounted, so we're using our prototyping and integration facilities to explore how best to integrate IVAS onto aircraft and ground combat vehicles to give Soldiers a better understanding of the battlespace before they enter it.

SUITE UPGRADES

A C5ISR Center electronics engineer demonstrates the C5ISR Electronic Warfare Modular Open Suite of Standards (CMOSS), a uniform open system architecture that will allow fast and flexible upgrades of tactical hardware and software. (Photo by Kathryn Bailey, Program Executive Office for Command, Control, Communications – Tactical)

Before, the program of record would have dealt with up to six individual organizations to accomplish these tasks. Now, there is a single point of entry to the center that coordinates across our capabilities and expertise to provide quicker, streamlined, holistic support.

Our new structure also gives our scientists, engineers and business professionals the opportunity to expand their horizons, get involved in multiple functional areas and use their talents as broadly as possible. This will help us build a culture of greater collaboration, innovation and creativity, better supporting career development and job satisfaction for our employees while improving capabilities that will ensure our Soldiers remain the most dominant land force in the world.

CONCLUSION

We are committed to developing and maintaining a unified, integrated C5ISR culture and clear lines of communication within the organization. We also intend to simplify how our partners and stakeholders within the acquisition community, DEVCOM and industry interact with us.

There's never been a better time to align to the future, and we are ensuring our organizational posture, structure, processes and culture are enabling us to deliver the best integrated capability possible to the warfighter. The reshaped C5ISR Center is well positioned to address the Army's modernization priorities and deliver capabilities supporting multidomain operations through 2035 and beyond.

For more information, go to ***https://c5isr.ccdc.army.mil/****.*

JOSEPH WELCH is the director of the C5ISR Center, a component of DEVCOM. He holds a Master of Engineering degree in systems engineering from Stevens Institute of Technology and a B.S. in electrical engineering and economics from Tufts University. He is DAU Level III certified in program management and engineering, and he is a member of the Army Acquisition Corps.

PROTECTORS OF COMPETITION

When a sole-source award for Humvee control unit components was challenged, GAO found that the Army didn't know the minimum quantity needed, and had made no effort to determine that number. The FAR instructs contracting officials to act affirmatively to obtain and safeguard competition, rather than taking a passive approach. (Photo by Sgt. Samuel Hartley, 131st Mobile Public Affairs Detachment)

ON CONTRACTING

THE LURE OF URGENCY

In defense acquisition, you can't always get what you want.

by Dennis P. Longo

The seventh and final article in the On Contracting series, based on the Competition in Army Contracting course developed by the author for the Office of the Deputy Assistant Secretary of the Army for Procurement.

While on deployment in 2003, my commander told me more than once with regard to procurement requirements, "It got here yesterday, you work on it today, and you get it here tomorrow." In other words, we received the procurement requirement yesterday, you work on the procurement requirement today, and you get the items here tomorrow. The focus of our procurement efforts in theater was an urgency to obtain goods and services immediately to sustain successful military operations.

We've been in wartime mode since the turn of the century, and that urgency mantra continues to ripple throughout Army acquisition. Labeling procurement requirements as urgent seems to be the "usual" practice in our current high-paced era of increasing international conflicts and emerging threats. It seems that, no matter what the environment, no contract action may be set aside for another day irrespective of your workload or those meetings and conferences you have scheduled.

Ask the requiring activity or program manager if the request for a sole-source contract action that he or she submitted today may be delayed for a few days and the answer without hesitation will be an unconditional "No." That may, perhaps, be for good reason. But federal procurement regulations are intended to limit competition based on unusual urgency, not on usual urgency.

When the urgency of a procurement requirement results in a decision to restrict full and open competition to one or a limited number of sources, that urgency must be "unusual" and not merely pose a risk of an unacceptable delay. The urgency must be so unusual, in fact, that the government is compelled to take the extraordinary action to limit competition simply because there's not enough time to solicit and award a contract for the requirement using normal competitive procedures.

REMOVE BEFORE FLIGHT
The Cessna T-37 is a trainer aircraft used by the Air Force for more than 50 years, until it was retired in 2008. In 1990, the service awarded sole-source contracts to two suppliers for replacement fuel cells, but GAO determined that the contract provisions included unnecessary standards for extensive flight testing of the parts. (Photo by Harry Toneman, U.S. Air Force)

The Federal Acquisition Regulation (FAR) identifies such an urgency as "unusual and compelling urgency," and one where the United States would be "seriously injured" unless the number of sources solicited is limited, according to FAR 6.302-2. (B-243382.3 Durodyne Inc.)

Restricting competition because an unusual and compelling urgency exists is an authorized exception to the full and open competition requirements of the Competition in Contracting Act, implemented at FAR 6.302-2. However, federal procurement regulations don't define urgency as it relates to restricting competition for the government's procurement requirements. One may reason that, if one can simply explain the need to procure a particular item or service quickly, competition requirements may be waived.

The Government Accountability Office (GAO) has provided some guidance as to what circumstances may result in an unusual and compelling urgency and as we'll see in each of the following examples, unusual compelling urgency is not always defensible.

RULE NO. 1

Limiting full and open competition must not be based on a lack of advance procurement planning.

FAR 7.102 requires federal agencies to perform acquisition planning and conduct market research for all acquisitions. Typically, acquisition planning should begin as soon as the agency need is identified, preferably well in advance of the fiscal year in which contract award or order placement is necessary. (FAR 7.104(a).)

Example 1. The Navy had been working on the performance requirements for a replacement contract, issued a solicitation, realized the solicitation requirements were not adequately defined, and canceled the solicitation. Because these contracts would expire within a matter of weeks, performance under both contracts was extended on the basis of "urgent and compelling circumstances."

In 1996, New Breed Leasing submitted a protest to the GAO, complaining that there was no rational basis for the sole-source extensions, and that the sole-source contract extensions resulted from a lack of planning.

In response to the protest, the Navy claimed it hadn't realized that both solicitations' requirements were not adequately defined until the end of July 1996. Consequently, because both contracts would expire Sept. 30, 1996, both required an extension for an entire year because the requirement must undergo "a thorough and comprehensive review and rewrite."

It turns out that the solicitation requirements for the follow-on contract were identified in July 1994, the acquisition plan was approved June 1995, proposals submitted in response to the solicitation were submitted by October 1995, and the proposal evaluation was completed by June 1996. When the contracting officer sought approval from headquarters in July 1996 to proceed with negotiations, headquarters expressed its concern that the request for proposal lacked definitive task descriptions. The Navy canceled the solicitations on Aug. 8, 1996, and subsequently extended both contracts. In essence, the Navy realized that the solicitations were flawed more than a year after the solicitations were issued and more than eight months after proposals were submitted.

The protest of the Navy's action to the GAO was sustained because the contract action resulted from a lack of advance planning. (B-274201 New Breed Leasing.)

"Advance procurement planning" may appear redundant. One could reason that all planning is done in advance. But the FAR intends procurement planning to be conducted well in advance;

not momentarily or spontaneously. When procurement planning is not conducted in advance or timely, such planning may be unreasonable.

Example 2. The Army had been reporting safety messages regarding the vehicle control unit, a protective control box in the Army's Humvee, since 1999. The control unit had caused the vehicle's starter to crank on its own, causing the batteries to drain of their power, short out and catch fire, and potentially destroy the vehicle. Because replacements for the vehicle control units were needed immediately, and anticipating that the issuance of the safety message would create a significant demand for a replacement electrical starter system, the Army executed a justification to limit full and open competition based on unusual and compelling urgency and awarded a sole-source contract to a single firm to obtain replacement vehicle control units.

In April 2001, an Army deputy for system acquisitions decided that all vehicle control units, of any version, would be replaced as soon as the stock was available, and a second sole-source contract was awarded to procure the needed units. The sole-source justification supporting this second sole-source contract was approved on the basis of unusual and compelling urgency.

A protest challenging both sole-source contract awards was submitted to the GAO. The GAO found that the Army didn't know the minimum quantity necessary to satisfy its immediate urgent requirement because it did not know how many control units were still in the field and would have to be replaced. Despite this lack of knowledge, the Army made no effort to determine how many control units were in place and there was no explanation why the Army couldn't determine the number of units to be replaced.

Government personnel turnover and inexperience essentially recognize the lack of planning and merely provide an excuse based on the limitations of the agency's personnel.

Sustaining the protest, the GAO found that the Army failed to conduct reasonable procurement planning. Knowing of safety concerns with a vehicle control system that would have to be replaced, the Army took nearly two years to draft performance specifications.

Key point. Contracting officials must act affirmatively to obtain and safeguard competition; they cannot take a passive approach and remain in a noncompetitive position where they could reasonably take steps to enhance competition. (B-288107 Signals and Systems Inc.)

In each of the prior examples, the government's actions to issue sole-source contracts resulted from a failure to conduct advance procurement planning.

RULE NO. 2

Urgency caused by personnel turnover and an inexperienced staff is not adequate rationale to support unusual and compelling urgency.

Example. Significant decreases in personnel resulted in the Defense Mapping Agency awarding a contract for grounds maintenance services for sites in Virginia and Maryland by

WOULD YOU LOOK AT THE TIME?

Limiting full and open competition by awarding a sole-source contract must not be based on a lack of advance procurement planning. Acquisition planning should begin as soon as the agency need is identified, preferably well in advance of the fiscal year in which contract award or order placement is necessary. (Photo by Getty Images)

authority of a justification to limit full and open competition under unusual and compelling urgency because the Defense Mapping Agency didn't have enough time to prepare the work description for a competitive procurement. The agency's incumbent contract for grounds maintenance services expired on Sept. 30, 1992.

The agency explained, in its justification to limit full and open competition, that it was unable to procure a replacement contract using full and open competition by Oct. 1, 1992, because the requiring activity was unable to prepare a timely statement of work because of personnel vacancies, inexperience of existing staff and an excessive backlog of work.

The award was protested to the GAO.

After reviewing the protest, GAO concluded that the award was improper and sustained the protest, ruling that agency personnel turnover and inexperience cannot justify a noncompetitive procurement based on urgency. In GAO's view, a failure to promptly draft adequate specifications and "an excessive backlog of work" are both unacceptable justifications. (B-252614 TLC Services.)

Key point—Government personnel turnover and inexperience essentially provide an excuse based on the limitations of the agency's personnel.

RULE NO. 3

Risk to military operations or human safety is an important element justifying limiting competition based on unusual and compelling urgency.

Certain items of military hardware and weaponry may be needed quickly to support mission operations in theater. The government should not risk injury to personnel or property in order to conduct a competitive acquisition when there is a critical need for certain supplies or services to support military operations. (B-402908 Argon ST Inc.)

Circumstances of unusual and compelling urgency because a critical need exists for certain supplies or services impacting military operations is an important factor that may support restricting full and open competition. (B-243067 Lundy Technical Center Inc.)

Example. The polypropylene sandbags used in Iraq had deteriorated at an unexpectedly fast rate. In addition, more of the sandbags were needed to meet force-protection requirements. In November 2004, the government agency requiring these sandbags awarded four noncompetitive contracts on the basis of unusual and compelling urgency because the United States would be seriously injured unless it limited the number of sources. A current, although unsuccessful, firm manufacturing these sandbags for the government under a separate government contract protested the awards to the GAO, complaining that it should have been solicited for the requirement.

The GAO denied the protest and found that the urgency of the requirement was caused by the unexpected rapid deterioration of sandbags, the increased demand for sandbags in Iraq, and the performance problems experienced on the protester's current contract.

The contracting officer decided to restrict the current manufacturer from receiving an award for the urgent requirement because of the delinquent deliveries under its existing contract and the outstanding questions concerning the acceptability of its offered sandbags. Compounding that was that even if that manufacturer were able to resolve the delinquency and acceptability of its products, it still would not have been able to complete delivery under its contract until March 2005. That further jeopardized the safety of military personnel. (B-295434 Total Industrial & Packaging Corp.)

WELL, THAT'S UNUSUAL
In 2004, the GAO supported a government agency decision to award four non-competitive contracts for polypropylene sandbags because of the urgent and unusual need. (Photo by 1st Lt. Kelly McManus, 1st Armored Brigade Combat Team)

In short, you may not always get what you want, but you get what you need.

RULE NO. 4

The work to be performed may not exceed the government's minimum needs.

The total period of performance of a contract action using the unusual and compelling urgency authority may not exceed the time necessary to meet the unusual and compelling requirements of the work to be performed under the contract action.

Example 1. The award of a sole-source bridge contract for home management and marketing services issued by the U.S. Department of Housing and Urban Development (HUD) was protested to GAO. The contract included a four-month base performance period and two four-month option periods. Chapman Law Firm protested the award, complaining that the term of the bridge contract exceeded HUD's minimum needs. HUD explained, however, that the term of the contract and its two four-month option periods were necessary in light of the possibility that the litigation surrounding the requirement would become protracted. HUD noted that litigation surrounding the award of these services in other areas of the United States had lasted as long as nine months. GAO agreed and denied the protest. Given this history of litigation, the contract did not exceed the agency's minimum needs at the time of the award. (B-296847 Chapman Law Firm Co.)

Example 2. Faced with the urgent need to obtain control room services, the U.S. Food and Drug Administration (FDA) awarded a six-month sole-source contract in 1985 with a source it determined was the only source capable of performing the required work immediately.

The FDA justified the need to obtain control room services as urgent and compelling circumstances. The contract included options allowing the FDA to extend contract performance up to two additional 12-month periods and an additional 5.5-month period. IMR Systems protested the FDA's sole-source contract to GAO, complaining that the FDA didn't request offers from other potential sources. Although the GAO ruled that the action was reasonable, it also found that the urgent and compelling circumstances failed to justify the 5.5-month option period. (B-222465 IMR Systems.)

Example 3. The Air Force determined in May 1990 that T-37 fuel cells for its training aircraft were urgently needed. It awarded a contract to each of two previously approved sources. The justification to limit full and open competition was based on unusual and compelling urgency to avoid a critical impact on the availability of its T-37 training aircraft and, because any other firm would need to have its fuel cell successfully flight tested for 300 hours in order to qualify, competition was limited to only the previously approved sources. A protest of the awards was submitted to the GAO, complaining that the flight testing requirement unnecessarily restricted competition. The GAO sustained the protest because the Air Force could not explain why the 300-hour flight testing requirement was necessary for all firms that had not produced T- 37 fuel cells. Essentially, the Air Force included restrictive provisions that exceeded its minimum needs. (B-239837 and B-239839 Engineered Fabrics Corp.)

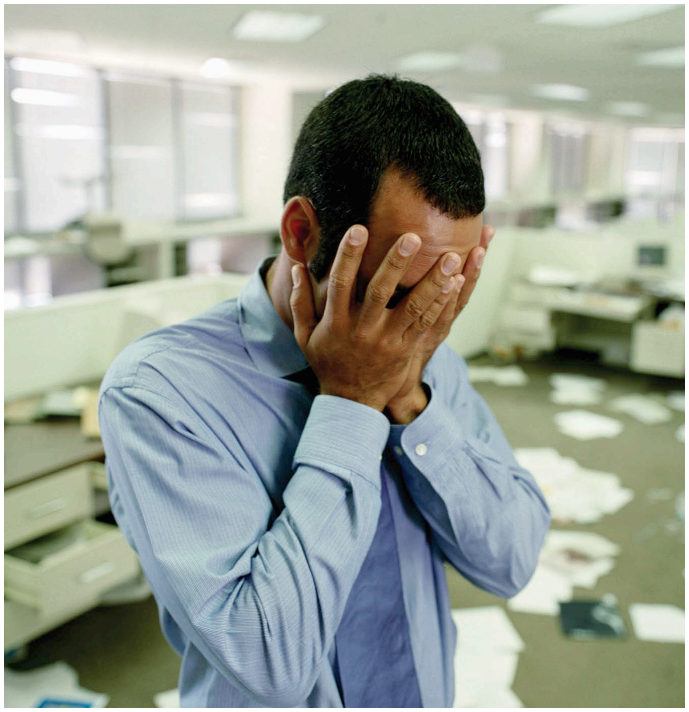
Key point. Understand the government's minimum essential needs and clearly articulate in the justification why those needs are essential. Any need beyond the government's minimum does not justify limited competition.

RULE NO. 5

Properly documenting the rationale for limiting competition on the basis of unusual and compelling urgency will expedite the government's response to satisfy its needs.

The information necessary to accurately document the rationale to limit competition based on unusual and compelling urgency may not be readily available, particularly when the urgency affects

A FAILURE TO PLAN
Even if half of your employees retired tomorrow, urgency caused by personnel turnover and an inexperienced staff is not adequate rationale to support unusual and compelling urgency. (Photo by Getty Images)



WAITING UNTIL THE LAST MINUTE
The FAR intends procurement planning to be conducted well in advance, not momentarily or spontaneously. When procurement planning is not conducted in advance or timely, such planning may not be seen as reasonable. (Photo by Getty Images)

military operations or personnel safety. Here are some elements that should be addressed in a justification limiting competition based on unusual and compelling urgency:

- Explain why the requirement is urgent and how it compels the government to take the unusual approach to pursue a sole-source action and exclude all other sources from competing for the requirement.
- Identify the serious injury the government will sustain if the action to limit competition is delayed, including risk to personnel safety or risk to mission failure.
- Discuss the circumstances of the urgency and how it occurred.
- Identify when we were first made aware of the urgent need.
- Characterize the urgency by explaining why we are taking action now to limit competition.
- If procuring items, identify the quantity of those items and how we determined that the stated quantity meets the government's minimum, urgent need.
- If procuring services, identify the unique and essential performance requirements of those services and how we determined those performance requirements will meet the government's minimum, urgent need.
- Identify the date when the items or services must be provided and why no other date will suffice.
- Describe how the government will be seriously injured if we don't procure the items or services from one or a limited number of sources.
- Discuss why only one or a limited number of sources can satisfy the government's urgent need.
- Discuss the capability of sources to deliver the required items or services.
- Identify the estimated cost of the items or services and how that cost was calculated.

We have a regulatory requirement to separate our wants from our needs when it comes to procuring goods and services. The government's procurement requirements must be written to the extent necessary to satisfy the needs of the agency or as authorized by law and not its ambitious desires.

For more information on unusual and compelling urgency and other exceptions to the Competition in Contracting Act, go to the Competition in Army Contracting training on the ***procurement.army.mil*** *LearningCenter at* ***https://go.usa.gov/xMaAg****.*

DENNIS P. LONGO retired from Army Contracting Command, Aberdeen Proving Ground (APG), Maryland, on July 31 after 39 years in public service. He was advocate for competition, task and delivery order ombudsman and senior procurement analyst at the Army Contracting Command at APG. A member of the Army Acquisition Corps, he holds a bachelor's degree from the University of Baltimore, is Level III certified in contracting and acquisition, and his assignments included acquisition specialist at the Program Manager for Chemical Demilitarization and procurement analyst at the U.S. Army Legal Services Agency. He served in the military from 1971 to 1973 at the Southern European Task Force – Italy, and deployed to Iraq as a civilian in 2003. He authored the Defense Acquisition University (DAU) Continuous Learning DOD Purchase Card Tutorial in 2002, the DASA (P) Competition in Army Contracting course in 2019 and the DAU CON 0160 Competition in Contracting course in 2020. He taught courses on competition in contracting since 2004. The first of the author's On Contracting articles appeared in the Winter 2020 edition of Army AL&T.

AGILE MANUFACTURING GAINS AGAINST COVID

Defense Assisted Acquisition cell cranked up manufacturing to support the fight against the pandemic.

by Erik Heine

CRITICAL EFFORT
The DA2 screening and diagnostics team was able to secure the onshore production of pipette tips. They are critical to molecular-based testing and sustainment of the nation's blood supply. (Image by iStock, anyalvanov)

In the early months of 2020, as the U.S. government and the nation watched with trepidation as COVID-19 arrived on our shores, "testing" became the buzzword that was at the forefront of everyone's minds. Unfortunately, the need to test so many people in such a short period of time severely impacted national stockpiles of testing supplies. Supply manufacturers, many of which were abroad, could either not keep up with demand, or could not deliver products because of shipping issues. Among the maelstrom of response activities, Lt. Col. John Nuckols and the Defense Assisted Acquisition (DA2) screening and diagnostics team executed some of the most complex and nuanced medical acquisition efforts both inside and outside of the United States, with vendors who traditionally have not done business with the U.S. government.

TESTING, TESTING, TESTING

Early in the pandemic, one of the main issues hindering response efforts concerned overcoming the shortage of specialized specimen collection swabs. From the start, Nuckols and the DA2 screening and diagnostics team were aggressive in their efforts to increase U.S.-based swab production. Initially, they were able to increase the production rate from a baseline of 14.5 million swabs per month (pre-COVID-19) to the potential to produce approximately 147 million swabs per month. However, as the pandemic continued and additional waves of increased infection occurred, the U.S. Department of Health and Human Services (HHS) realized the national requirement was actually closer to 300 million swabs per month. Performing an exhaustive market search of swab manufacturers across the U.S., the DA2 screening and diagnostics team identified opportunities to increase U.S.-based production of specimen collection swabs optimal for COVID-19 testing, which are expected to provide approximately 350 million swabs per month. This represented a 24-fold monthly increase in the specialized swabs, which are essential to the performance of all U.S. Food and Drug Administration (FDA) emergency use authorization COVID-19 tests in the U.S.

The team also invested in the growth of test kit manufacturing on behalf of the HHS Office of the Assistant Secretary for Health, the HHS Office of the Assistant Secretary for Preparedness and Response and the Biomedical Advanced Research and Development Authority. Starting with the clinical laboratory, where most diagnostic tests before and during the pandemic have been performed, the team managed six investments in the expansion of diagnostic test kits and their associated analyzer platforms, expected to increase test kit production by 64 million tests per month. Next, they shifted their focus from laboratory-based testing to the tests performed at the point of care, such as in clinics

WHAT'S DA2?

The Defense Assisted Acquisition Cell, nested within the Joint Rapid Acquisition Cell in the Office of the Assistant Secretary of Defense for Acquisition, is poised to rapidly respond to the nation's most urgent acquisition needs in current and future national emergencies. It has assumed the interagency efforts for COVID-19 medical resource acquisition.

Leveraging acquisition and subject matter experts from across DOD to meet urgent U.S. government acquisition requirements, it provides policy and oversight to drive awareness and unity of effort.

Following DOD's acquisition support to the Department of Health and Human Services and the Federal Emergency Management Agency during the COVID-19 pandemic, the undersecretary of defense for acquisition and sustainment (USD(A&S)) recognized the need to ensure acquisition assistance. Accordingly, the USD (A&S) established the Defense Assisted Acquisition Cell on Oct. 13, 2020. Built on the urgent capability acquisition that the Joint Rapid Acquisition Cell executes on behalf of DOD during wartime, the DA2 Cell acquires goods and services as rapidly and effectively as possible for the federal government in support of the American public. The Defense Assisted Acquisition Cell provides acquisition assistance when the magnitude of the government's requirements overwhelms the lead response agencies, leveraging the Economy Act to provide acquisition assistance on behalf of and in coordination with interagency partners.

(SOURCE: Defense Assisted Acquisition Cell (DA2) website, **https://www.acq.osd.mil/asda/jrac/da2/index.html**)

HOME TEST
A COVID-19 home test kit. The DA2 screening and diagnostics team enabled the manufacturing expansion of two at-home testing capabilities that are expected to produce 600,000 at-home tests per day. (Image by iStock, clubfoto)

and doctor's offices, with an emphasis on testing underserved populations as well as senior citizens in assisted living or retirement communities. This resulted in three investments to increase manufacturing for these point-of-care tests to 10 million tests per month. The team anticipates further increasing production capacity of point-of-care tests by 30 million per month in the near term.

Recognizing that additional testing opportunities existed, the DA2 screening and diagnostics team worked with Office of the Assistant Secretary for Health and representatives from the White House Coronavirus Task Force and the COVID-19 Health Equity Task Force to identify, invest in, expand production of, and procure COVID-19 tests with an FDA emergency use authorization for use by individuals from the convenience of their homes. Not only did these investments make access to testing easier in the U.S., they also reduced the potential for exposure of high-risk individuals receiving testing from a clinic, doctor's office or laboratory. Through their efforts, the team picked up the torch on two research and development investments by the Biomedical Advanced Research and Development Authority and the National Institutes of Health's Rapid Acceleration of Diagnostics initiative, and funded the manufacturing expansion of two at-home testing capabilities, expected to provide the capacity to produce 600,000 at-home tests per day.

The team manages a testing and diagnostics portfolio of $2.1 billion in investments, with an expected $1.1 billion in near-term awards. These investments are expected to yield the tests and testing supplies required by HHS and the nation, including a total expected increase of 120 million tests per month. This represents the majority of the target increase in U.S. testing capability defined by HHS.

BRING IT ON HOME

Another major hurdle during the pandemic revolved around international sourcing of supplies. With the lack of availability, transportation issues and governmental restrictions, the team understood that onshore production was one of the keys to increasing capacity. The DA2 screening and diagnostics team received funding from the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) to build a team of military, civilian and contractor personnel to provide continued industrial base expansion expertise and counsel on acquisition efforts, and to maintain situational awareness regarding availability of industry resources. These integration efforts advanced the development of the Rapid Acceleration of Diagnostics, the Biomedical Advanced Research and Development Authority and the Office of the Assistant Secretary for Health and ASPR initiatives, resolved urgent test distribution crises and aligned industry partners to enable development, and ultimately delivery, of the next diagnostic capability.

Throughout the COVID-19 pandemic the DA2 screening and development team has always delivered.

MAKING GRADE
The DA2 screening and diagnostics team helped establish a national testing network in support of the national priority to reopen K-8 schools. (Photo by iStock, kevajefimija)

As an example of this enhanced interagency collaboration, working with the U.S. Department of State, the team ensured on-time delivery of manufacturing equipment necessary to produce COVID-19 testing materials and brought industry to the table to discuss efforts to move their manufacturing to the U.S. in support of COVID-19 testing. Working internationally, and paired with their ongoing U.S. industry engagement activities, the team was able to secure the onshore production of pipette tips, which are critical to molecular-based testing and sustainment of the nation's blood supply. While onshore production was ramping up, the DA2 screening and diagnostics team further ensured the national supply of pipette tips for COVID-19 testing and blood product testing were never exhausted by coordinating weekly airlifts of 3 million to 6 million pipette tips per week, from approved manufacturing facilities in Germany to distribution centers supplying the nation's clinical laboratories. This effort became critical to ensuring there was no interruption of highly sensitive molecular testing in the United States.

In addition, the investments in the onshore production of pipette tips was followed by supply chain investments in critical test reagents and other diagnostic supply chain resources. These supply chain investments ensure sustainability of the test expansion efforts made thus far, support the U.S. diagnostic infrastructure and prepare the U.S. medical system and strategic national stockpile for the next pandemic.

SCHOOL'S OUT

One of the greatest challenges the DA2 screening and diagnostics team executed, on behalf of and in coordination with HHS, was the effort to establish a national testing network using untapped diagnostic testing resources and laboratory capabilities in support of the national priority to reopen kindergarten through 8th grade (K-8) schools. This investment included execution of three other-transaction authority agreements through Army Contracting Command – Rock Island, Illinois, to establish regional testing hubs across the United States. The DA2 screening and diagnostics team seamlessly aligned HHS's vision with U.S. Army program management, contracting and technical support resources, soliciting robust interest and response from the diagnostics industry. The White House COVID-19 test lead deemed this capability essential to reopening K-8 schools immediately; keeping them open in the fall when students return to school, and continued expanded access to testing for underserved populations across the United States.

Not only did these investments make access to testing easier in the U.S., they also reduced the potential for exposure of high-risk individuals receiving testing from a clinic, doctor's office or laboratory.

PASSING THE TEST
A Soldier from the 111th Theater Engineer Brigade medical section conducts COVID-19 testing at Camp Buehring, Kuwait. Every Soldier on Camp Buehring is required to test negative before redeploying to the United States. (Photo by 1st Lt. James Mason, 111th Engineer Brigade)

OVERSEAS DEPLOYMENT
An 82nd Airborne Division paratrooper gets tested for COVID-19 at Fort Bragg, N.C., in May. The testing is in preparation for participation in Swift Response 21, a joint, multinational airborne exercise involving more than 7,000 paratroops from 10 NATO nations. (Photo by Master Sgt. Alexander Burnett, 82nd Airborne Division)

CONCLUSION

Throughout the COVID-19 pandemic, using their acquisition capabilities and acumen, the DA2 screening and development team has always delivered. In addition to being professional acquisition experts, the DA2 team members are "pathfinders," exploring all solutions and strengthening the resolve of the relationship between DOD and HHS. The team structure they have built is the model adopted by other DOD teams supporting the White House executive order to expand enduring U.S. domestic vaccine capacity, by building and maintaining infrastructure to increase long-term pandemic preparedness. They continue to codify efficiencies and support development of policies and procedures to maintain expedited actions on national priorities, expansion of U.S.-based production capacity, and timely procurement of immediate-need testing resources. Their support of the nation throughout this pandemic has moved the country forward, and helped it outlast the adversity of the moment.

For more information, go to ***https://www.jpeocbrnd.osd.mil/coronavirus.***

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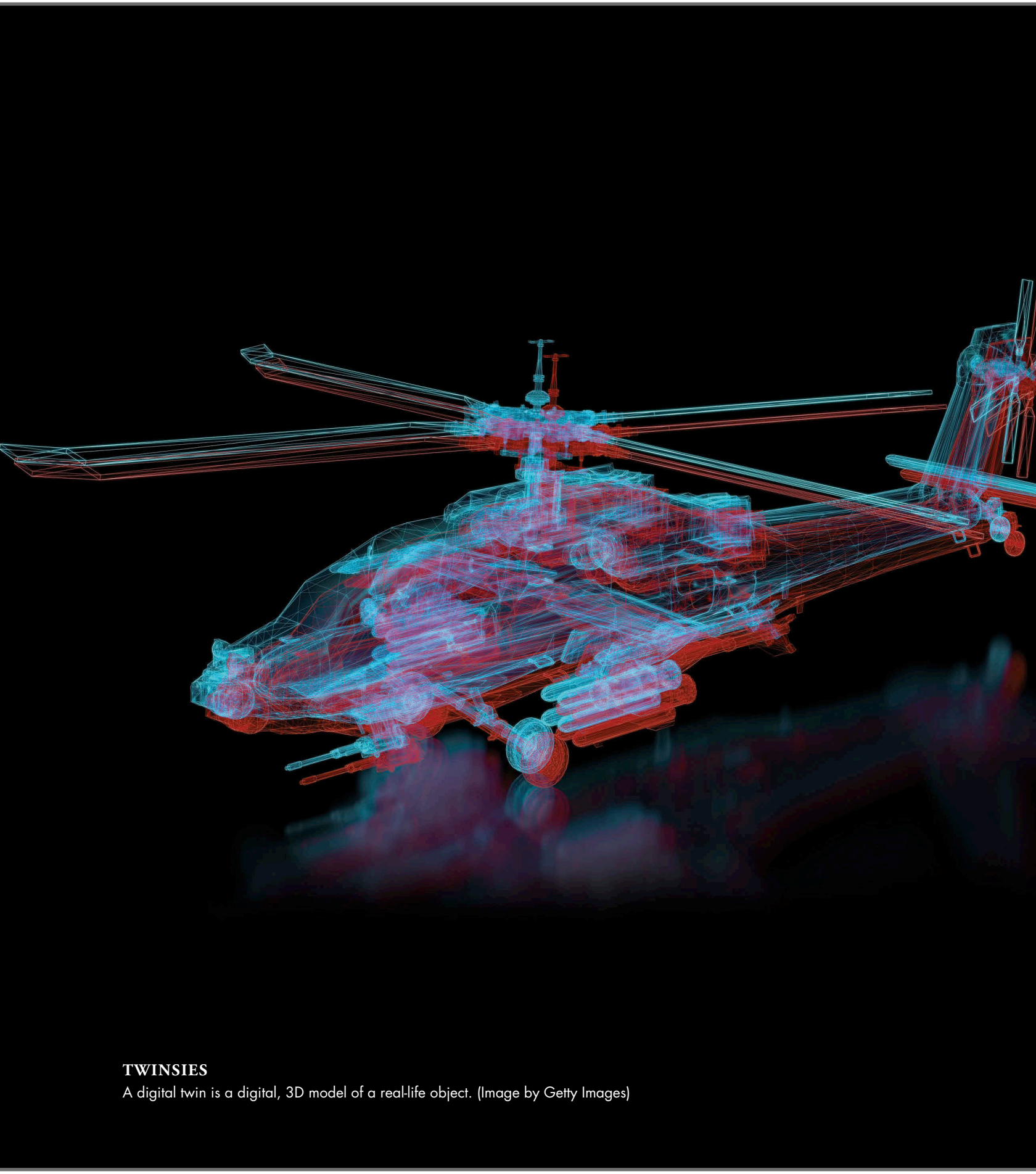
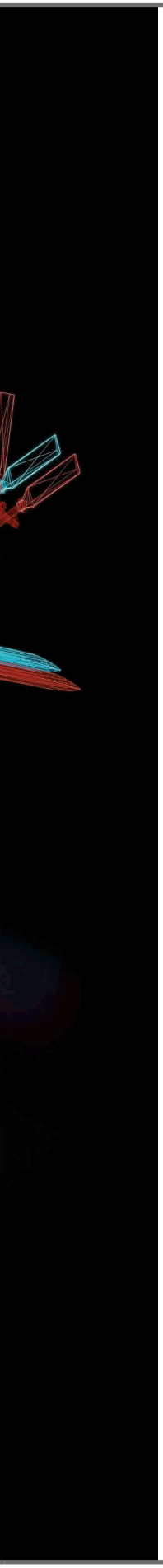


TWINSIES
A digital twin is a digital, 3D model of a real-life object. (Image by Getty Images)



ON THE **DOUBLE**

U.S. Army Aviation and Missile Command is leading the way in digital twin technology for the Army.

by Jacqueline M. Hames

In the not-too-distant future, Soldiers will be able to access detailed, 3D models of helicopters, tanks and other vehicles, with a part-by-part rendering of every aspect of the vehicle. Not only measurements, but also listings of what each part is made of and how it affects other parts connected to it. With these 3D models, Soldiers, following appropriate processes, will be able to access specifications and 3D-print select replacement parts, or interact with the model to identify approved areas of where a new radio would fit best—without the frustration and expense of real-life dashboard Tetris.

But that technology isn't available to Soldiers—yet.

That's where U.S. Army Aviation and Missile Command (AMCOM) comes in: It is on a mission to make that future possible for the Army with digital twin technology. A digital twin is just that—a digital, 3D model of a real-life object, with all the nitty-gritty details of the object accounted for in the model. Army AL&T spoke with Joyce Myers, AMCOM's chief data and analytics officer, in June to learn about the effort.

In September 2020, Maj. Gen. K. Todd Royar established the AMCOM Data and Analytics Center—the office Myers leads—"to address our digital transformation and all things related to data and analytics, to include our governance and our data literacy program," she said, which covers advanced manufacturing and digital 3D models. The research and advisory company Gartner defines data literacy as the ability to read, write and communicate data in context, including an understanding of data sources and constructs, analytical methods and techniques applied—and the ability to describe the use case, application and resulting value. "Therefore, as we include advanced manufacturing and digital 3D models into our day-to-day business, we want to ensure that our data literacy program addresses those specific emerging data areas and not just the familiar data areas already known and familiar to our employees," Myers explained.

DRIVING FORCE
Maj. Gen. K. Todd Royar, AMCOM commanding general, established the AMCOM Data and Analytics Center to address digital transformation. (Photo by Traci Boutwell, AMCOM)

"Every single bit of data that we receive or create, we're responsible for creating a structured governance program around that—policy, catalogs, quality, security, etc.," Myers said. The center is looking at not only how to fix or improve processes already in place, but also how to lay the foundation for the future.

AMCOM's UH-60 Black Hawk digital-twin pathfinding project is a major part of that future foundation.

WHY BLACK HAWKS

The commercial world is ahead of the Army on digital twin and digital thread technology, Myers said, which is one of the biggest challenges she and her team face. "Industry has already started changing their business processes to adapt to new technology, and we need to as well," she said.

"What we're truly doing right now is taking an existing helicopter apart and then we're using a hand scanner to scan the part to create 3D models," Myers said.

To catch up with the power curve, AMCOM has partnered with Wichita State University's National Institute for Aviation Research (NIAR) in developing the twin technology for the Army. "They are the cutting edge," Myers said of NIAR. It is one of the leading aviation research institutes in the country, with projects from helicopters to hypersonics.

Another reason AMCOM chose to partner with Wichita State was that it already had demonstrated its capability with the Navy in creating a digital twin of the FA-18. Royar noted, however, that AMCOM's approach was slightly different. To make the process go faster and yield benefits sooner, AMCOM also partnered with the manufacturer, Sikorsky, on the project. "This is a win-win for both the government and industry," Royar said.

NIAR is sharing lessons learned from its existing and past efforts, as well as the software and skills to create the twin. It's also helping AMCOM identify aviation parts that would make good candidates for the advanced manufacturing process, Myers said.

AMCOM chose the Black Hawk for the project out of practicality. "That's what we have the most of in the Army inventory and also in all of the other services," Myers said. There were enough Black Hawks in the field to pull one out of service for the project without adversely affecting Soldiers, she explained.

THE PROCESS

Scanning a helicopter is no easy task. First, the helicopter—just the structural shell, with all the electronics and rotor blades removed—had to be brought to the research center. "For this effort we are focusing on the major structural components; we're not scanning any of the wiring, harnesses, nuts, bolts or the brackets. We're not scanning the transmission." Myers said, a note of relief in her voice.

Once the helicopter skeleton arrives, Wichita State students and supervising engineers take it apart, piece by piece, scanning each part with a hand-held scanner. Yes, that's right—even large pieces are being scanned by hand.

"We're trying to figure out which questions we should ask, which answers do we need—it is truly a pathfinder."

After each part is scanned, it is matched with 40-year-old structural drawings of the Black Hawk—some of which are difficult to read—and labeled with the correct name and part number, Myers explained. "Every single part is identified," she said.

To create the full 3D twin, the team has to merge the information in the old 2D drawings with the 3D scan. "That scan gives us a complete 3D model file," Myers said. "Now we are starting to get the full picture. [The twin] tells us the measurements, it tells us what each scanned part is called, it tells us the part number, it puts in the distribution statement [minimum security level required to read it], it puts in the export warning control [identifies export-controlled technical data], it puts in the annotations," such as dimensions, geometric tolerances, symbols and notes to document the design and manufacturing requirements.

The team will scan approximately 5,000 individual parts over the course of 30 months, she said. During that arduous process, as each structural component scan is completed, NIAR will review it for quality control and then send it back to the Army. "We will put it into our product life cycle management tool that we use, that the Army uses," and it will undergo different engineering reviews for further quality and safety evaluation, Myers said.

"Now this is where it's starting to be real interesting," she continued. "How do we tie that to the logistics process? How does a logistician go in and look at and understand this 3D model? Do logisticians and maintainers have the software and skills to be able to do it?"

This is another aspect of the pathfinding process, Myers said. Finding out which software needs to be purchased at what cost, who should be viewing the twin

VIRTUAL MODEL
A UH-60L fuselage and an operational Black Hawk helicopter are transported in May from Corpus Christi Army Depot in Texas to Wichita State University in Kansas, where researchers at the National Institute of Aviation Research will create a virtual model. (Photo by Lisa Simunaci, AMCOM)

ON THE WAY
An operational Black Hawk helicopter and a separate fuselage begin an 800-mile journey on May 18 from Corpus Christi Army Depot in Texas to Wichita, Kansas. (Photo by Lisa Simunaci, AMCOM)

LOOKING AHEAD
AMCOM's Data and Analytics Center is looking at how to fix or improve processes already in place, as well as how to lay the foundation for the future. The Black Hawk digital-twin pathfinding project is part of that future. (Photo by Lisa Simunaci, AMCOM)

PROVEN PARTNER
One reason AMCOM chose to partner with Wichita State was that it already had demonstrated its capability by creating a digital twin of the Navy's FA-18. (Photo by Lisa Simunaci, AMCOM)

model, what skills are needed, etc. "We're trying to figure out which questions we should ask, which answers do we need—it is truly a pathfinder," she said.

The Black Hawk, at 40 years old, has parts that are obsolete or hard to get—some vendors don't want to make parts for it because the drawings are too difficult to read, and they would have to reverse engineer to make a model, mold or casting to create a replacement part from that "old, often hard-to-read drawing," Myers said. "We can use these models to give to vendors to perhaps create a part after it's been qualified for advanced manufacturing, after it's gone through the appropriate qualification process."

In the future, the Army could require manufacturers to provide a digital twin with each type of aircraft—creating a digital thread from the beginning of the manufacturing processes. In fact, the National Defense Authorization Act for Fiscal Year 2022 asks that DOD report on the development of digital twin technology and how it can be best used in the future.

TWINS AND THREADS

The digital twin has another sibling, sort of—the digital thread. What's the difference between a digital thread and a digital twin? Simply put, a digital twin is the current representation of a system or product, while the digital thread is a lifetime record of the system or product, from creation to removal.

"Digital threads start at the beginning," Myers said. Engineers create a digital model of something that does not currently exist that they would like to produce—like a new and improved recliner, she explained. This is also where the digital twin begins, at the from-scratch manufacturing process. The Black Hawk

WORKHORSE
The UH-60 Black Hawk is the workhorse of Army aviation. (Photo by Spc. Thoman Johnson, U.S. Army Pacific Public Affairs Office)

twin pathfinding project is doing things a little backward, since it is producing a twin of something that already exists, to help inform future efforts.

However—at the beginning of the digital thread—the twin is used for engineers to perform various analyses. Will the chair hold a certain amount of weight? Will it flip back too far when opened with vigorous force? And that digital model, after testing, is used to build a prototype, Myers said, which then endures its own round of tests.

After that round of testing, advanced manufacturing can be brought into the digital thread process. Parts of the recliner can be engineered to be lighter and stronger, or new 3D-printed features can be added, she said.

"We're creating that digital thread from the time [an aircraft is] created as a new platform through its entire life cycle," Myers said. "So, if we add a radio, we update the digital twin with the radio on it and we know exactly where it's been mounted. In four years, if that radio comes out for whatever reason, we can update the digital twin and show that the space is available again."

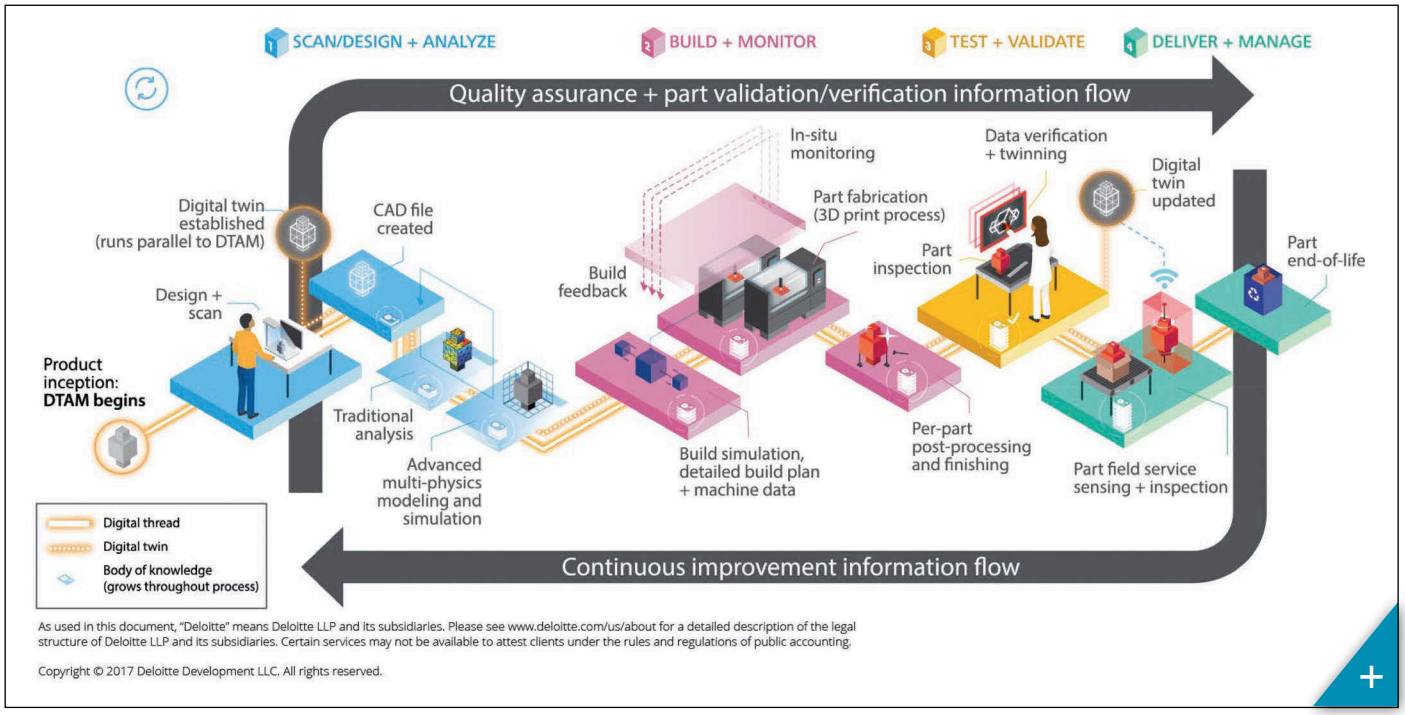
Scanning a helicopter is no easy task.

THE FUTURE IS PRINTED

AMCOM's March 2021 policy memorandum addressed advanced manufacturing for Army aircraft parts, components and support products. As aircraft like the Black Hawk continue in service, the supply system faces obsolescence challenges—parts becoming hard to buy or make—and advanced manufacturing, using the digital thread and twin technologies, can help overcome those challenges.

"The policy is really put in place to provide some structure and guidance to say, these are the different categories of the aviation items that can be printed," Myers said. AMCOM's policy is there to help provide further guidance on the Army's overall advanced manufacturing policy for the aviation enterprise. "Gen. Royar held working groups … [with] our aviation counterparts, GE, Boeing, across the community to come together as a collaborative cohort, if you will, to write this" policy. The policy is not static, though, and they are already working on the next revision.

AMCOM is also working closely with Army Materiel Command, which is leading the advanced manufacturing effort, she said. The policy will help determine what will make a good candidate for advanced manufacturing in the aviation community.



BUILDING A TWIN
A digital twin and a simultaneous digital thread for additive manufacturing (DTAM) are twinned processes, from beginning to end. (Graphic by Deloitte Development LLC)

"We will be able to print parts, but we may not want to advance-manufacture airworthiness or critical safety items today based on the technology available. However, having a digital model for these complex parts sets the groundwork for the future," Myers said. "There's going to be levels of who can print what. It'll be very controlled and tied to specific roles to ensure traceability."

Advanced manufacturing, using the digital thread and twin technologies, ultimately will help improve the supply chain, reducing the lead time on part acquisition and potentially allowing for on-site part production for quick repairs.

"We're already engaged with Wichita State to look at some composite advanced manufacturing of parts," Myers said. They are working with the university to determine appropriate processes and what might be missing in the AMCOM advanced manufacturing strategy, she added.

AMCOM is also pursuing other advanced manufacturing efforts with different universities—like Auburn University in Alabama—"and the Army looks forward to realizing there's a lot of value to be gained by partnering with academia, especially where they have research on the front end," Myers said.

CONCLUSION

The digital twin technology will help improve supply and maintenance for current aircraft like the Black Hawk. But if AMCOM can improve its processes and skills, identify the right software and pinpoint gaps in policy and procedure, it will help to inform the people, process and technology decisions as it moves forward.

"Gen. Royar's just really leaning forward to make sure that not only is he helping the Soldier today, but that we keep helping Soldiers for years to come," Myers said.

For more information, contact the AMCOM Data and Analytics Center at ***usarmy.redstone.amcom.list.data--analytics@mail.mil****.*

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UNDERSTANDING ACQUISITION: THE VALLEY OF DEATH

The valley of death or the chasm sounds like a place where vultures wheel in the hot desert air over the carcasses of the technologies that couldn't make it across. It's an apt metaphor, but the valley of death is not a place. It's a condition.

The metaphor is applied to a wide range of products, including both incremental improvements and disruptive innovations, in many industrial and public settings. As a major developer and user of new technologies, DOD suffers greatly from the valley of death. In acquisition, the valley of death is often an unintended byproduct of an aging acquisition system that wasn't built for the speed of modern innovation.

What it means, generally, when a program is lost in the valley of death is that the program was abandoned for at least one of four primary reasons: financial, technical, doctrinal or organizational culture.

FINANCIAL

Time and money are everything in acquisition, but *timing* of money is also important. If a new technology gets on DOD's budget submission before the annual February deadline, it has a chance to be funded in the next fiscal year, which begins in October. However, that best-case scenario still leaves a gap of, at minimum, seven or eight months. That rosy scenario isn't the norm. If a program isn't in the budget request, it has to wait for the next one. It can take two years or more from viability for a program to get funded.

Congress does not always pass a budget on time. A stopgap continuing resolution does not provide for anything new. It would just fund at the same rate as the last budget. Such resolutions add to the time between viability and funding. That can be murderous for small business, though it's not such a big deal for traditional defense prime contractors with a lot of irons in DOD's fires. For a small company, even with a genius solution, that might as well be forever.

TECHNICAL

Most often, programs don't get abandoned in the chasm because of any fault of their own, but there is a major exception. More than one program has been abandoned in the valley of death because a technology it depends on just can't get past a technical readiness level that its requirement demands. Other times, technologies are overtaken by the speed of change in either advances in technologies or the nature of threats.

DOCTRINAL

The Army tends to want its acquisitions to fit within its doctrine. Its Big Six modernization priorities all fit within the doctrinal concept of multidomain operations. That's because all six come from verified needs that have arisen as that operational concept evolved. A company could have a wonderful new invention or innovation, but if it falls outside that multidomain concept, it could come to a screeching halt. Doctrine can change when there's an event or technology that fundamentally alters national security.

ORGANIZATIONAL CULTURE

Most of the materiel the Army acquires is in the category of innovation—a new way of using something or doing something, rather than that of invention, or something entirely new. The technologies behind the Big Six already exist. The Army wants better, faster, deadlier—a leap ahead in the states of those arts. The Big Six are acquisitions that are going to happen and will have plenty of juice to get past the valley of death. The acquisition culture, however, tends to be less enthusiastic when it comes to solutions that are genuinely novel, overtly impinge on a cultural norm or a well-established routine, or produce a "that's not how we do it here" reaction.

In the graphic that follows, we have tried to show, as simply as possible, how the condition of the valley of death happens. There are dimensions that are not possible to show in a simple graphic. The condition is not guaranteed by fate, but built into the defense acquisition system.

—JOHN DILLARD, Col., USA (Ret.) and recently retired senior lecturer at the Naval Postgraduate School

—STEVE STARK, senior editor, Army AL&T

UNDERSTANDING ACQUISITION: THE VALLEY OF DEATH

RELATED CONCEPTS

TO UNDERSTAND THE VALLEY OF DEATH, IT'S HELPFUL TO UNDERSTAND SOME RELATED CONCEPTS IN ACQUISITIONESE.

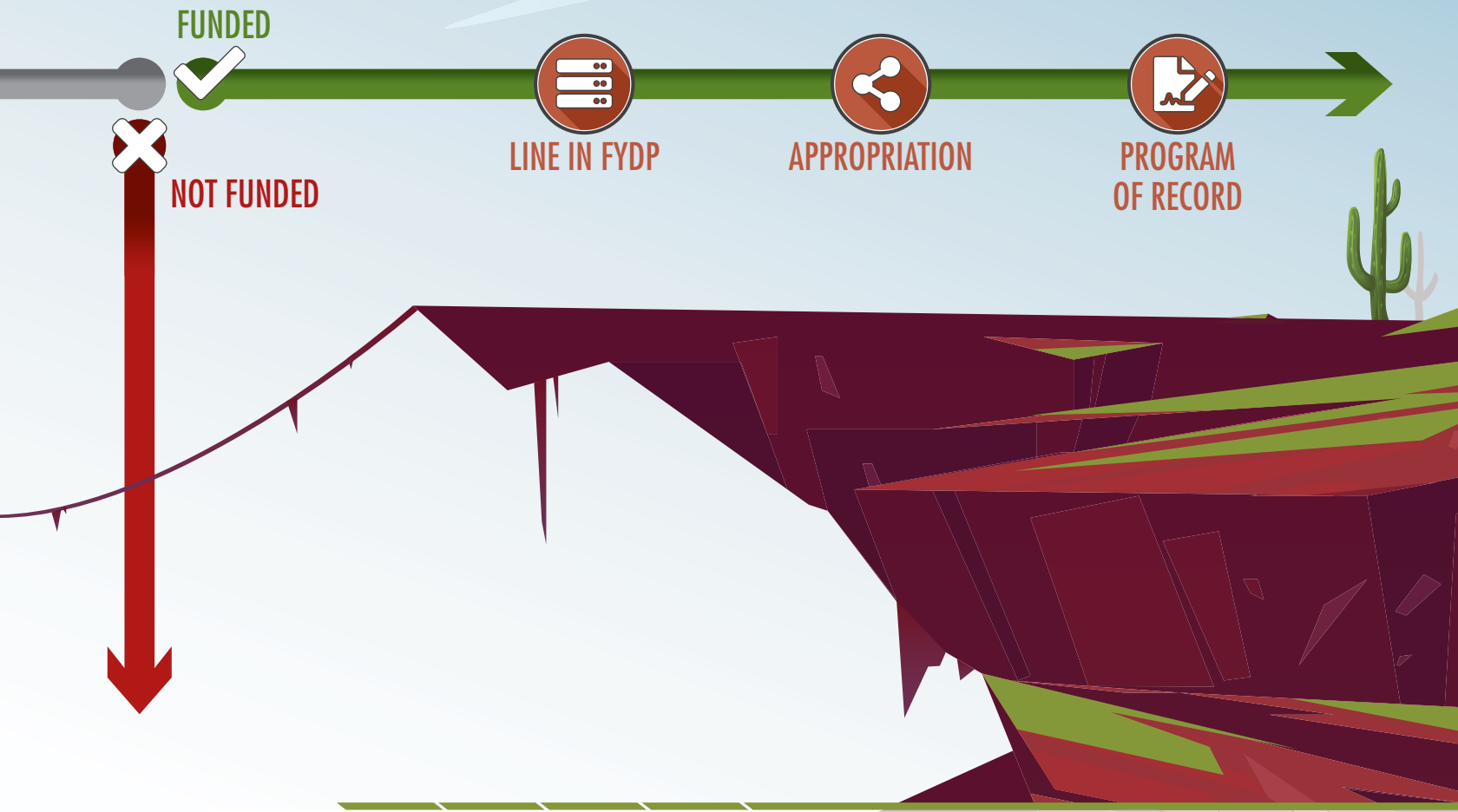
VALIDATED REQUIREMENT

The Army buys virtually nothing without a validated requirement. These explain to Congress how the Army is spending its appropriations and they explain to the contractor what the Army wants, very specifically. Requirements come from needs expressed by commanders and they can also come from Army leaders looking to close capability gaps. The Army Requirements Oversight Council vets and validates them—or doesn't. The Army likes capabilities to follow doctrine. This is a cultural thing—the Navy often experiments with capabilities and builds doctrine around new ones.

FUTURE YEARS DEFENSE PROGRAM (FYDP)

Often pronounced FIEdip or FIDdip. FYDP is essentially a database that represents DOD's "program" and financial plan—what DOD plans to do and how it's to be funded—over the next five years and as approved by the defense secretary. That program is divided by organizations, colors of money and major defense programs. FYDP is part of the planning, programming, budgeting and execution process and gets updated twice during that cycle. FYDP connects Congress's authorizations with specific military programs.

Assuming that a militarily relevant technology can be matured to work as intended, that is no guarantee that it will get a line in the FYDP and end up as a program of record or part of one. Most of the time, the Army can't spend money on new technology without a validated requirement to tell Congress what it is and why it needs it. Without being in the Army's February budget submission to DOD, there is little chance that, when the new fiscal year begins in October, the program will see any money. For a small company with only a single product or small number of innovative products for which the Army is the only customer, that can mean the valley of death because of the length of time it could take them to get funded. There are other ways into the valley of death. Among these are when a technology fails to transition, when a change in doctrine makes a program less useful or a major strategic issue makes a technology irrelevant, or failure of a program to gain support from a key stakeholder.



TECHNOLOGY TRANSITION

"Technology transition" is when a technology is sufficiently mature to move from research to development. It now has the potential to be a useful capability in an operational environment. However, just because it's useful doesn't mean it will get funded. Technology transition is not to be confused with technology transfer, which is the transfer of technology among government, industry and academia.

PROGRAM OF RECORD

Programs of record are programs that appear in the FYDP and for which Congress has appropriated funding or intends to. Generally, approval of the program objective memorandum (POM) when the program is in the POM makes it a program of record. Congress funding a program means that it's a program of record. A program that has a validated requirement and a line in the FYDP is a program of record.

JIM ELLIOTT

COMMAND/ORGANIZATION: Program Executive Office for Missiles and Space, Strategic and Operational Rockets and Missiles Project Office

TITLE: Program integration officer

YEARS OF SERVICE IN WORKFORCE: 11

YEARS OF MILITARY SERVICE: 20

DAWIA CERTIFICATIONS: Level III in program management

EDUCATION: B.S. in business administration, Columbia College

AWARDS: Achievement Medal for Civilian Service

BUILDING TEAMS

If you know Jim Elliott, you know he loves playing sports. He has always been competitive by nature, something that is evident in his personal life and his professional life. "Most people know me for my love of sports and playing sports, such as golf and baseball. This competitive drive to win or succeed definitely has commonality with my professional career," he said. Elliott is the program integration officer for the Strategic and Operational Rockets and Missiles (STORM) Project Office within the Program Executive Office for Missiles and Space (PEO MS). PM STORM is responsible for the development, testing, acquisition, fielding and sustainment of the STORM portfolio of launchers and munitions. In this role, Elliott focuses on strategy and teamwork—likely drawing more inspiration from the sports world.

"My position requires me to assist the STORM project manager and deputy project manager in strategic planning and synchronization across the product teams with PEO MS staff, Department of the Army staff and other teams to ensure programmatic success," he said. "I also assist in science and technology synchronization with the U.S. Army Combat Capabilities Development Command Aviation and Missile Center and Army Capabilities Manager, ensuring future requirements are addressed." In addition, he is the "face of the project office" to warfighters in the field when they have questions, issues or concerns regarding the Multiple Launch Rocket System (MLRS), the High Mobility Artillery Rocket System (HIMARS) and associated munitions.

Elliott has been part of the Army Acquisition Workforce for 11 years now, but he has been involved with Army rockets for decades. It's something that people often find interesting about his work. "My 20 years of service in the U.S. Army as an active-duty Multiple Launch Rocket System and High Mobility Artillery Rocket System launchers crew member from 1986 to 2010, with a four-year break after my initial enlistment." While he was serving as a crew member on the MLRS and HIMARS launchers, he became interested in project requirements and capabilities, which ultimately led him to return to the Army as a civilian after completing his active-duty service.

"As the senior capabilities noncommisioned officer at the ACM [Army Capabilities Manager] office in Fort Sill, Oklahoma, I worked directly with the project office of future requirments and capabilities, which I found very interesting, and I desired to continue work in this field after active duty," he recalled. "I was

"I always engage our young acquisition captains, majors and young acquisition specialists to provide advice in career enhancement and opportunities to excel in their field."

"Bad news never gets better with time. Provide honest tactful feedback. Integrity is everything."

hired by the project office directly after active duty in 2010, as the Field Artillery Launchers Product Office product integrator." Elliott said he is passionate about providing warfighters with tools and capabilities that will allow them to dominate the battlefield, another facet of his career that begs a sports comparison. He has never forgotten his teammates, and he knows what it takes to win the game.

Elliott said he learned some important lessons and had many impactful experiences during his years on active duty, and he is happy to share his insights with younger Soldiers and civilians today. "I always engage our young acquisition captains, majors and young acquisition specialists to provide advice in career enhancement and opportunities to excel in their field," he said. "Also, in 2012, I created a commander's course, allowing young acquisition personnel to receive hands-on training with our launcher platforms and gain a better understanding, from the Soldier's point of view, of the programs they are managing."

What have been the most important points of his career? Elliott cited the three most poignant experiences. "The first significant point in my career was deploying in 2011 to Afghanistan in support of Joint Special Operations Command for a munitions failure investigation." According to Elliott, another important career milestone happened in 2012 when he was "leading a software program to bring organic software for the launcher platforms into the U.S. government. This milestone was a first for a major weapons combat system and is currently fielded to the platforms in the field." And finally, he said he learned a lot when working in support of U.S. Special Operations Command. "I led a software development program from 2013 to 2016 to provide fire support from maritime vessels with our launchers and munitions."

More recently, he completed the Army Supervisors Development Course, and he definitely recommends it to others. The Supervisor Development Course is a web-based course with lessons that focus on supervising civilian employees. It equips supervisors with the knowledge necessary to successfully manage work processes and lead teams in the Army environment, and is required for anyone who supervises Army civilian employees. "I completed the Supervisors Development Course in March 2021," he said. "The course provided a wealth of information and knowledge in supervising Department of Defense civil servants. This course is critical to becoming a supervisor."

Throughout his 20 years of active duty service and his 11 years as an Army civilian, Elliott has learned and experienced countless important lessons. The most important though, he listed without a moment's hesitation. "Bad news never gets better with time. Provide honest tactful feedback. Integrity is everything." On the sports field and in his career, he is a team builder and motivator, always sharing advice with others and keeping his focus on the ultimate goal—equipping his team to win.

—ELLEN SUMMEY

ENGAGE THE FUTURE
Elliott, second from left, is pictured in 2018 with four former Soldiers he met while deployed in support of Operation Iraqi Freedom. Elliot has made it a point to mentor younger Soldiers throughout his career. (Photo courtesy of Jim Elliott)

A GARAND HISTORY
Robert Bell, an M1 Garand armorer, holds one of the historic rifles at Camp Perry, Ohio, in August 2018. Over the past 65 years, most of the rifles have been rebuilt, refinished, rebarreled and repaired at least once, with few in original condition still today. (Photo by Sgt. Dana Beesley, U.S. Marine Corps)

PERSEVERANCE PAYS OFF

The development of the M1 Garand Rifle—from not quite right to world beater.

by Dr. Thomas E. Ward II

"In my opinion, the M1 rifle is the greatest battle implement ever devised." —Gen. George S. Patton Jr.

During World War II, no other nation was able to field a full-power semiautomatic rifle as its primary infantry weapon. Several tried, but for a variety of reasons, they all failed. The U.S. Rifle, Caliber .30, M1 (known informally as the M1 Garand) earned a reputation for accuracy, reliability and ruggedness, but the real technology-enabled overmatch was in terms of firepower. No one else could match the hard-hitting firepower in the hands of the U.S. infantryman. Adversaries were simply outclassed. Still, a little-known part of the M1 Garand story includes a serious redesign effort. The original design, the "gas trap" Garand, did not work very well.

While today's culture has developed an expectation that new technology drives near-instantaneous evolutionary innovation, the much more mundane backstory is often long and complex. The development of the M1 Garand provides an example, and a cautionary tale. Employing the latest technology in new weapon systems is hard work, and the results are not always predictable. Sometimes the acquisition community gets it right, but seldom do they get it right the first time. The M1 Garand provides an example of an initial design that wasn't quite right, but with a few design changes it went on to become one of the most successful infantry weapons of all time.

COMBINING NEW TECHNOLOGIES

In its original "gas trap" incarnation, the M1 rifle exhibited serious performance problems in the field. Although its development was lengthy and deliberate, the original design was deeply flawed. However, hard-nosed realism and listening to the experience of Soldiers in the field led to a relatively simple redesign that resulted in "the greatest battle implement ever devised."

The desire to develop and field a self-loading infantry rifle was almost universal in the years between the First and Second World Wars. Several recent or emerging technologies were available that could be combined to achieve that goal, but no one was quite sure exactly *how* to combine those technologies in a way that worked. The development of

smokeless powder in 1884 was the first key. Smokeless propellants reduced the visible signature created when a weapon was fired, providing a significant advantage on the battlefield. They also enabled higher chamber pressures and greater projectile velocity, which in turn enabled the use of smaller diameter, lighter-weight projectiles with a greater effective range. These were enormous advantages that were recognized and exploited almost immediately. Rifles could be designed with shorter barrels, which meant lighter-weight weapons. Lighter projectiles meant that the individual Soldier could carry more ammunition. Additionally, the use of smokeless propellants greatly reduced the amount of corrosive residue left behind in the weapon from the burned propellant. With the dramatic reduction of corrosive fouling, it became possible to design reliable mechanisms that could eliminate the requirement to manually manipulate a bolt to extract a spent cartridge, cock the weapon and load a fresh cartridge in the chamber. Weapon designers recognized the possibility, but combining the new technologies was another matter.

There were essentially two competing technologies:

1. Using the recoil energy to operate the action;
2. Using the energy of combustion gases to operate the action.

Recoil-operated mechanisms emerged first.

THE RECOIL APPROACH

Semiautomatic pistols emerged in the late 19th century. For low-powered pistol cartridges, the inertia of a slide combined with the tension of a spring sufficed to keep the cartridge case in the chamber long enough to allow chamber pressure to fall off. Higher-powered cartridges required a breech-locking mechanism, and a method of delaying breech unlocking. The U.S. M1911 pistol used a short recoil design, in which recoil caused matching grooves and lugs in the barrel and slide to disengage after a relatively short length of travel caused by recoil.

COMPARATIVE QUALITY
The U.S. Marine Corps' two primary rifles in WWII were the M1903 Springfield (middle) and the M1 Garand (bottom). A .30-40 "Krag" rifle is shown at top. (Photo by U.S. Marine Corps)

The desire to develop and field a self-loading infantry rifle was almost universal in the years between the first and second World Wars.

Recoil-operated design of semiautomatic weapons was not confined to pistols. The original Maxim machine gun, which first appeared in 1884, used a recoil-powered toggle lock linkage in its design.

During World War I, the U.S. developed the Pederson device, a recoil-powered adapter that could be placed in a slightly modified M1903 Springfield rifle, making it capable of semiautomatic fire. However, the Pederson device did not use the .30-06 rifle round. Instead, it employed a much lower velocity pistol-type cartridge, so it lacked the range and power of the full-sized rifle round. The technology to adapt semiautomatic operation to a full-power individual infantry weapon just wasn't available.

EXPANDING GAS

The competing technology used expanding combustion gases to cycle the operating system. Inventors tried a variety of technological approaches to use propellant combustion gases to achieve automatic or

semiautomatic operation of firearms. Some used gas ported from the barrel (a "gas port" design), while others used gas escaping from the muzzle (a "gas trap" design). The original M1 Garand employed a fixed muzzle cap to trap muzzle gases, which then acted on a gas piston that moved in the opposite direction from the projectile.

Several other weapons tried this design; none were successful. The problems were with the basic design concept. Once gases escape from the muzzle, they tend to cool rapidly, leaving carbon deposits behind (carbon fouling). Additionally, primers of the day used corrosive salts that required careful cleaning after use, but the complex design of the gas trap mechanism and its close tolerances made cleaning difficult.

OVERCOMING CHALLENGES

The prototypes and early production specimens of the M1 Garand seemed to work well enough but proved to be unreliable in the field. Shortcomings included the complex procedure to clean the gas trap assembly, an unstable front sight and a weak bayonet mounting system. During field testing, a loose screw securing the muzzle cap to the barrel allowed the assembly to move out of alignment. This resulted in the projectile striking the gas trap assembly as the projectile exited the muzzle, taking the gas trap assembly with the projectile. Ultimately, John Garand—the rifle's principal designer and whose name it still bears—and the Springfield Armory in Massachusetts modified the design to employ a gas port drilled near the muzzle. The port bled combustion gases into a closed chamber, where the gases acted on a piston at the end of an operating rod. The cylinder and piston assembly near the muzzle was simple to remove for operator maintenance and proved to be extremely reliable.

Why did Garand initially use a gas trap mechanism, rather than a ported barrel and a closed-chamber gas piston? Although smokeless propellants had been around for 50 years, weapon designers of the day did not fully understand or trust the technology, even with examples of successful designs in the field. The Colt M1895 "potato digger" machine gun employed a gas port design, but its port allowed gas to move the lever as it escaped through the port and vented into the atmosphere. The M1918 Browning Automatic Rifle was a gas port design but was much too heavy to use as a standard individual weapon.

Distrust of the gas port was not unique to the United States. Interestingly, a 1941 German request for proposal equivalent precluded a ported barrel. The German G41 (M) and G41 (W) both used gas trap designs similar to the early Garand design, and were unsuccessful. A follow-on to the G41 (W), the G43, used a gas piston design and was highly successful, with 400,000 produced between 1943 and 1945. However, the Americans had at least a five-year head start. Americans recognized and solved their problems with their semiautomatic infantry rifle before they entered the war.

Initial adoption of the M1 Garand did not go smoothly. Springfield Armory produced roughly 50,000 "gas trap" rifles between 1936 and 1940. Unfavorable field experience prompted a redesign, from a gas trap to a gas port. Fortunately, the modification

CEREMONIAL USE

The M1 Garand is now frequently used for ceremonial purposes, including honor guards and color guards. (Photo by Petty Officer 3rd Class Elliot Schaudt)

A FINE VINTAGE
A Marine Corps combat instructor fires an M1 Garand during a vintage rifle live-fire competition on Camp Pendleton, Calif., in 2018. (Photo by Lance Cpl. Drake Nickels)

was easily implemented in new production, and modification of existing gas trap rifles could be accomplished at depot level maintenance facilities. Starting in 1940, all new production of M1 rifles used the new gas port design.

What became of the 50,000 gas trap Garand rifles produced between 1936 and 1940? Priority for distribution for the majority of the early production rifles was to the troops in the field—including U.S. Army forces in the Philippines. For refit of existing gas trap rifles, the plan was to replace the gas trap assembly when the barrel or the gas trap assembly became unserviceable. Rifles within the United States were returned to U.S. depots for modification. Rifles issued to deployed units were modified by forward depots. A small number of gas trap rifles saw service during WWII. The upgrade modification process was ultimately successful, and the vast majority of M1 rifles received the modification long before the war's end. Consequently, unmodified gas trap Garand rifles are exceptionally rare today and command an enormous premium in the collector's market.

The original design, the "gas trap" Garand, did not work very well.

A number of M1 rifles fell into Japanese hands when besieged U.S. forces at Corregidor Island in the Philippines surrendered. The Japanese exploited this technical intelligence bonanza and worked hard to reverse-engineer the M1 Garand design for their own use. They were only partially successful. Japanese copies of the M1 never progressed much beyond the prototype stage. An example of the Japanese Type 4/Type 5, a copy of the M1 Garand rifle, can be seen in the collection of the National Rifle Association Museum.

PROVEN IN BATTLE

At the beginning of the WWII, the U.S. Army was committed to replacing its M1903 Springfield rifles with M1 Garand rifles. The U.S. Marine Corps did not adopt the M1 until 1940, so it began WWII relying primarily on the M1903 Springfield rifle. Photographs of the Guadalcanal campaign show Marines equipped with Springfield rifles. Marine Corps forces did the best they could with what they had, and their success at Guadalcanal hinged on the ability of U.S. Navy forces to prevent Japanese reinforcement. U.S. Army forces began reinforcing the Marines on Guadalcanal in November 1942, and in December the U.S. XIV Corps assumed responsibility for the operation. As U.S. Army forces flowed in, the Marines observed firsthand the enormous increase in firepower that Army forces enjoyed with the M1 Garand. Seeing was believing, and the Marines were finally convinced they needed "some of that." Reequipping Marine Corps forces with the M1 Garand became a high priority, and the Marines thereafter enjoyed the same firepower advantage that their Soldier brothers brought with them to Guadalcanal.

FROM GOOD TO GREAT

The rest, as they say, is history. The adoption of the gas port design to the M1 Garand turned a flawed, mediocre weapon into a world beater—literally. The U.S. had an enormous head start over both its enemies and its allies in its development of the infantryman's rifle. That head start was the result of deliberate and persistent effort over a period of many years, starting immediately after the end of WWI. The path was not a straight one; it was full of dead-end ideas and concepts that were ahead of their time. Still, by the time the original gas trap Garand was selected and fielded, no one else was even close to fielding a full-power,

self-loading service rifle. In the intervening years between the rifle's adoption and the U.S. entry in WWII, the Army had an opportunity to sort out the "bugs" before putting the rifle to the ultimate test of combat. That was time well spent. While it may have been a "good" design, the gas trap Garand was not great—it had too many problems. The relatively minor modification, from a gas trap design to a gas port design, made all the difference in the world.

CONCLUSION

What lessons should one learn from this experience? First, despite years of developmental effort by the best designers in the world, the first product may not turn out to be quite what we expect. Low-rate initial production (today's term for producing an initial batch of approximately 10 percent of anticipated production) is an excellent practice. The U.S. Army is doing exactly that right now with the Joint Light Tactical Vehicle. Putting a new product in the hands of troops and paying attention to their feedback based on experience creates an opportunity to detect and correct unexpected shortcomings.

These days, the U.S. does not design and produce its small arms in the arsenal system any longer. It outsources that function to industry and relies on commercial sources for meeting its needs. That makes prototyping and competitive testing even more important than ever.

The complex story of the M1 Garand's development provides good cause for encouragement. The rifle's groundbreaking design wasn't quite perfect at birth, but it was close. Although field performance of the gas trap design was sorely disappointing, with just a little bit of tweaking it became a great rifle—the stuff of legend, and the very best, most reliable "friend" for millions of GIs.

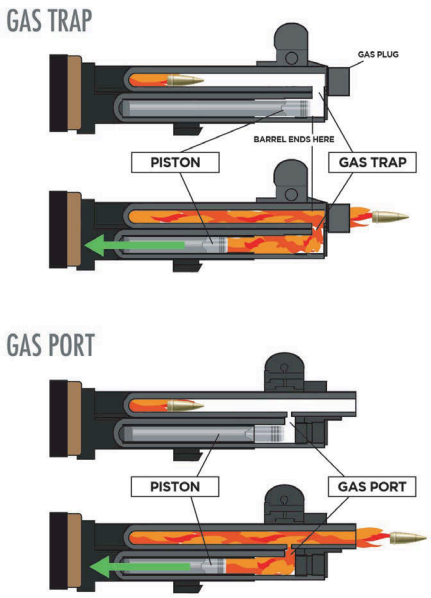
For more information on the Springfield Armory and the development of the M1 Garand, go to ***https://www.nps.gov/spar/index.htm.***

DR. THOMAS E. WARD II is an associate professor in the Department of Sustainment and Force Management at the U.S. Army Command and General Staff College (CGSC) at Fort Leavenworth, Kansas. He has a Ph.D. in organization and management from Capella University, an MBA from the Florida Institute of Technology and a B.A. in political science from the University of Oklahoma. He served 26 years on active duty as a U. S. Army ordnance officer, and has taught force management at CGSC for 14 years.

THE PRECURSOR

James Speraw, an Army curator, shows Joseph W. Westphal, then undersecretary of the Army, a T3E2 semiautomatic, .276-caliber experimental rifle at the Army Center of Military History's Museum Support Center Facility at Fort Belvoir, Virginia, in 2012. This rifle, developed by John Garand at Springfield Armory, was the precursor to the M1 rifle of WWII fame. (Photo by Staff Sgt. Bernardo Fuller)

FIGURE 1



GAS TRAP AND GAS PORT DESIGNS

In the gas trap design, hot gas is trapped after the projectile leaves the muzzle. In the gas port design, hot gas is ported to the gas cylinder before the projectile leaves the muzzle. (Graphic by the author and USAASC)

HEAVY METAL—BANNED

AMCOM is working to remove heavy metals from Army aircraft to ensure the health and safety of aviation personnel.

by Jacqueline M. Hames

In some jobs, there is an inherent danger that simply cannot be avoided—urban window-washers risk falling from great heights; Soldiers risk being shot during wars. But others have dangers that can be avoided. Aviation production and maintenance workers have been working with dangerous contaminants for many years, but the Army is putting a stop to that.

The U.S. Army Aviation and Missile Command (AMCOM) is developing new ways to eliminate heavy-metal exposure from the workplace. Heavy metals are any naturally occurring metallic chemical elements that have a relatively high density, such as mercury, cadmium, arsenic, chromium, thallium and lead. Some, such as zinc and iron, are required for good health in small amounts, but in larger amounts can be toxic. Others are just plain toxic in any amount—like mercury, cadmium and arsenic. AMCOM is eliminating the heavy metals in the aviation fleet, in part, through use of a new anti-corrosive coating—a Class N primer. But getting the primer into the manufacturing process and onto existing aircraft isn't exactly easy.

William Quinn, chief of operational safety in AMCOM's Safety Office, and Mark Feathers, program manager for AMCOM's toxic metal reduction program, sat down with Army AL&T over the summer to talk about how their organization is making the workplace safer for Soldiers and civilians.

STEEL FRAME—RUSTED

Corrosion is a natural, if undesired, part of the aviation life cycle. Rust—a type of iron oxide—is one of the most common forms of corrosion and can easily degrade metal equipment, helicopters and other vehicles in regular use if they don't have an anti-corrosive coating.

"If you have iron in an oxidated environment, what will happen is the oxygen will adhere to the iron and it will form iron oxide," Quinn said. "Over time that starts to

ENVIRONMENTAL HOTLINE

AMCOM's Environmental Hotline is available 24/7 at 256-313-1711 to report heavy metals or exposure to heavy metals. You can also reach safety personnel via email at ***usarmy.amcom-environmental@mail.mil.***

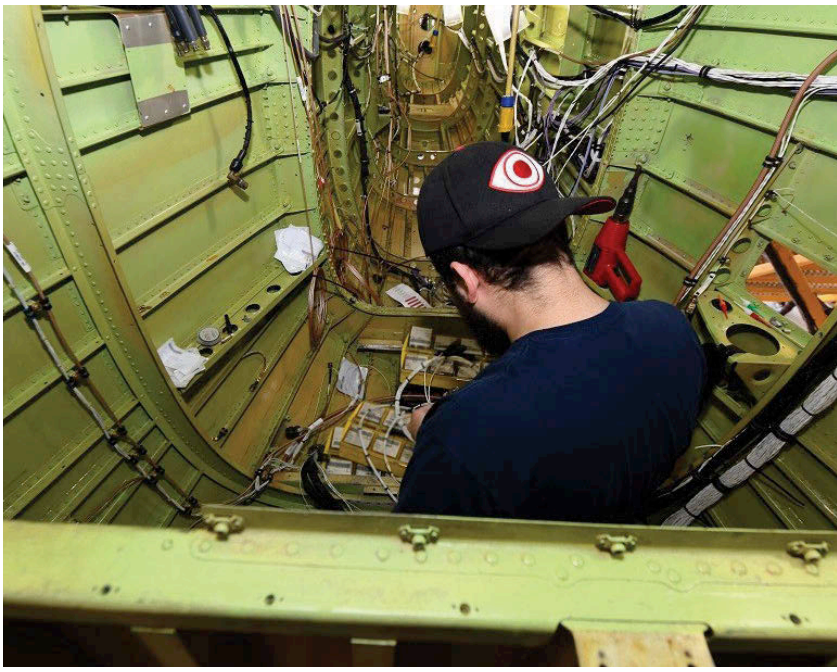
"We have literally removed a health risk from the work environment, ultimately removing the risk to our workforce."

break down and it forms more and more and more, until you get to the point where the iron oxide is basically all that's left." In other words, unprotected metals break down when exposed to oxygen and moisture.

One particular heavy metal, hexavalent chromium—also known as chromium-6 or chrome six—is used widely in aviation as an anti-corrosive protective layer. "Hexavalent chromium is a corrosion inhibitor that has been used in processes for over 50 years," Feathers said. Some of those processes include hard chrome plating, anodizing of aluminum and magnesium—which allows for better primer adhesion—sealants, adhesive bond primers, and as post-treatment sealing for other processes, like cadmium plating, and pretreatment of aluminum. "Coatings interrupt the corrosion process or minimize its ability to occur," he said.

AMCOM has been working for more than a decade to mitigate heavy metals exposure—they specifically began researching hexavalent chromium in 2006. The organization has always followed Occupational Safety and Health Administration (OSHA) and U.S. Army safety guidelines for permissible exposure limits, Quinn explained. But when the Army adopted the ACGIH (American Conference of Governmental Industrial Hygienists) lower hexavalent chromium exposure limit standard in 2018, this heavy metal's days became numbered. The new ACGIH standard is about 10 times more restrictive than the previous OSHA standard, Quinn said.

"We put together a heavy metals working group at AMCOM [in 2018] and we literally tested every single operation that had heavy metal exposure—specifically chrome six—and identified the levels, the risk and what we needed to do to bring those facilities into line," Quinn said. Because AMCOM started working on hexavalent chromium mitigation and replacement more than 10 years ago, it is now meeting the more rigorous 2018 standards, he added. The Army's heavy metals working group and those working the Army's toxic metal reduction program are a large part of that success.



FIRST OF MANY
John Farhat installs wiring for a UH-60L Black Hawk communications system inside the aircraft tail section at the Corpus Christi Army Depot. This is the first aircraft to be painted using 100 percent, chromium six-free Class N primers. (Photo by Ervey Martinez, Corpus Christi Army Depot)

The Army's toxic metal reduction program has worked with AMCOM to develop alternatives for hazardous constituents in the products used in aircraft and missile weapon systems depot and field maintenance processes. "We leverage existing technology or develop new ones" to do so, Feathers said.

One of those new methods is the Class N primer, which does not contain chrome six.

PRIMED

To remove heavy metal additives from the fleet, specifically hexavalent chromium, AMCOM must replace the anticorrosive coatings on current aircraft with the newly approved Class N primers.

All heavy metal "alternatives are all put through rigorous testing and demonstrations to ensure they will work and can be used safely, before they are approved." Feathers said. "Alternatives must always meet the original performance standards. As

PRIMED AND READY
Class N primer is applied to a UH-60 by the 1107th Theater Aviation Sustainment Maintenance Group at Springfield, Missouri. (Photo by AMCOM)

an example, alternatives to hexavalent chrome must meet the same standards as their original to be considered. They also have to be reviewed by the Army Public Health Center."

"The [Class N] primer is an epoxy coating that is applied over the pretreatment—which is on the base metal—and is designed to provide corrosion protection and also serve as a base layer to the polyurethane topcoat," Feathers explained. "The polyurethane topcoat is a chemical agent-resistant coating and does not contain hexavalent chromium."

Feathers described these coating layers as similar to the ones you can buy at your local hardware store, but with much higher performance.

But before the new primer can go on, the old coatings have to be removed. "There is a cleaning process to remove any contaminants before a chemical pretreatment coating is applied. Only then can the primer be applied," he said.

The Class N primer is applied to everything from the aircraft airframe to the components that go on it, like the gear box and transmissions made of magnesium, to all the many small parts on the aircraft. "You name it, just about every part gets primer on it," Feathers said.

The primer is applied using high-volume, low-pressure paint sprayers, applied at a specific thickness, and is usually tack free in about five hours and fully cured in 14 days in normal conditions, Feathers said. It can take up to 300 hours to prepare and coat the aircraft with primer, he added.

DRIVING THE CHANGE

Hexavalent chromium is extremely harmful to humans and the environment, which is why AMCOM is prioritizing its removal in its effort to remove heavy metals from the Army's aviation fleet. It can cause kidney and lung damage, as well as damage to DNA. It can leach into groundwater and cause damage to the ecosystem, Feathers explained.

For example, most people know the story of Erin Brockovich's litigation against Pacific Gas & Electric Co. (PG&E), settled in 1996. The company had used hexavalent chromium cooling towers to fight corrosion at a Hinkley, California, natural gas compressor station. The toxic wastewater from the towers was drained into unlined ponds and contaminated the groundwater, affecting an area of about two square miles around the station. "Of course, families in the neighborhood were drinking that stuff and [it caused] a cancer cluster in that area," Feathers said. PG&E is still working to clean up the site.

Maj. Gen. K. Todd Royar is driving AMCOM's push to remove current toxic coatings from the fleet and to incorporate new, nontoxic primers into the manufacturing process. Royar told Quinn that he didn't just want to meet current requirements, he wanted to exceed them—to be the leader in safety for aviation.

"So we put together a safety assessment and a risk analysis of all the operations within the Army, in the whole Army. And I was able to break it down to specifically those operations where we had hexavalent chrome exposure. We were able to present this to the Department of the Army heavy metal working group. As a result of that presentation, we became a member of

Heavy metals are any naturally occurring metallic chemical elements that have a relatively high density, such as mercury, cadmium, arsenic, chromium, thallium and lead.

that Army-level group and continue to communicate the results of our efforts to hopefully help others following in our footsteps," he said.

AMCOM is attacking the heavy metals problem from both ends—Feathers and the team at the toxic metal reduction program are identifying, certifying and qualifying all the products that will replace hexavalent chromium, and Quinn and the Safety Office are "working with the heavy metals working group to help facilitate policy change at the Army level to allow for use of the alternatives. So it's a two-pronged approach," Quinn said. "We call it our top-down, bottom-up approach. Maj. Gen. Royar embraced this strategy and has engaged throughout this process on both ends. His efforts have pushed us where we have broken new ground, gotten further than I thought we could, and are now starting to see impacts across the Army, DOD and even with our partner equipment manufacturers."

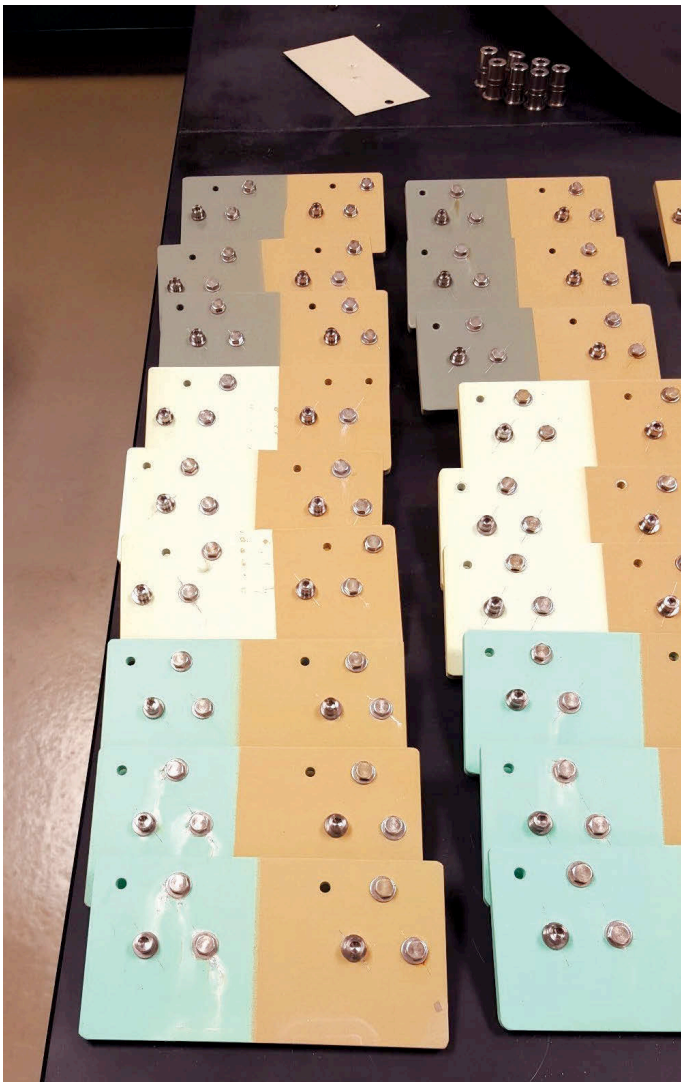
SAFETY FIRST

AMCOM is using mechanical methods, like plastic media blasting, to remove the coatings with heavy metals from aircraft. It's not an ideal method, as the dust created from the process poses a risk to personnel and therefore requires personal protective equipment. "AMCOM is investigating alternative removal methods," Feathers said.

"AMCOM performs routine testing at its industrial operations where there is potential for hexavalent chrome exposure, and provides standard and certified personal protective equipment," Quinn added. "Traditionally, when levels exceeded OSHA standards, additional precautions are taken. These include performing workforce medical surveillance, use of engineering controls including air shower, exclusion areas and special equipment with HEPA [high efficiency particulate air filter] vacuums attached, and use of personal protective equipment such as Tyvek suits and respirators. All this has been done to isolate areas of risk and prevent hexavalent chrome particulates from sanding and grinding processes from impacting our workforce and migrating to common areas," he said.

"The hardest exposure areas to control are field operations, since limited facility control and oversight are present. That is why replacing hexavalent chrome products is so critical to the health of Soldiers and the workforce," he said.

If Soldiers or civilian personnel are identified as being in an area with potential exposure to chrome six or heavy metal dust, they



ACING THE TEST

Class N primers undergo laboratory corrosion testing. At right, with topcoat, at left, without topcoat. (Photo by AMCOM)

Royar told Quinn that he didn't just want to meet current requirements, he wanted to exceed them—to be the leader in safety for aviation.

are fitted for a respirator, Quinn explained. Each person must have the respirator fitted specifically for his or her own use, and the filters must be checked for clogs and deterioration regularly, he said.

Safety officers perform "swipe tests" of the area, according to ACGIH standards, to monitor the level of hexavalent chromium dust in the air. Personnel in these areas are also checked medically. "If it's determined that an area has elevated chromate levels, at that point we ensure our employees in that area are medically tested. That medical surveillance includes regular blood tests and things of that nature to ensure our workforce remains safe," Quinn said.

Recently, Quinn performed an inspection at a paint shop at Corpus Christi Army Depot, AMCOM's aircraft industrial facility in Texas. While performing his inspection, the facility manager approached Quinn and showed him around the shop. "He says, 'Are you working with the team that's eliminating the hexavalent chrome from the process?' I said, 'Yeah, yeah, we are.' He … shook my hand and he said, 'I want to thank you,' " Quinn said. " 'You're making a safer workplace for us and that makes a difference.' "

"We have literally removed a health risk from the work environment, ultimately removing the risk to our workforce, removing the requirement for them to be medically surveilled," Quinn said.

CONCLUSION

AMCOM is pursuing a number of heavy metal mitigation and replacement projects, beyond hexavalent chrome, to help ensure the health and safety of its workforce, Feathers said. But the removal of hexavalent chromium primer remains AMCOM's current focus because it is so widely used and affects so many different installations. Three other efforts are being worked concurrently for hexavalent chromium removal. Zirconium oxide, which removes hexavalent chromium from many treatment processes, is in the final stages before implementation. It should go into use near the end of this fiscal year. In addition, AMCOM is already using tagnite, another pretreatment coating, on magnesium aircraft parts at Corpus Christi Army Depot. Replacement of sealants containing hexavalent chromium used throughout aircraft is also being addressed, and is expected to be pushed to the fleet by the end of the year.

The process of retrofitting the current fleet and incorporating Class N primers into the production line can get expensive—establishing a new plating line could cost $3 million or $4 million, Feathers said—but it's worth it.

"The cost associated with supplies and equipment—while not insignificant—pales in comparison to that of health care costs and loss of experienced professionals in the workforce due to illness," Quinn said. "The real cost savings is in the health and well being of the workforce, a healthy workforce means longevity, stability and sustained productivity."

"Under the leadership of Maj. Gen. Royar, we helped build a diverse and capable Army team, identified a common issue, developed a protection and replacement strategy, validated alternatives, obtained Army approval for the alternatives use and built consensus across aviation commands to stop using hexavalent chromium," he said.

AMCOM's goal is to remove or mitigate heavy metal risks to the Soldier and the Army's sustainment workforce. This effort will enable all aircraft that will remain in the Army's inventory to become chrome six free. In addition, these advances are being communicated to the rest of DOD and industry to remove them during initial production. However daunting, AMCOM hopes to remove hexavalent chromium from the fleet by the mid 2030s.

"The Army and our higher command, the Army Materiel Command, are committed to a safe environment for its workforce and Soldiers," Quinn said. "This hexavalent chrome replacement program on Army aircraft is just one example where AMCOM is playing our role in that commitment."

For more information, go to ***https://www.amcom.army.mil/****.*

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SHORTCUTTING COLD STORAGE

Excess materiel is expensive to deal with—
USASAC has a plan to make it way cheaper.

by Adriane Elliot

If the U.S. Army Security Assistance Command (USASAC) were just allowed to move Title 22 funds to the left of Title 10 decisions, it would be a coup in the Army's War on Excess, the effort to get units to turn in excess or unauthorized equipment in order to save money. Lem Williams has spent the last decade trying to get this message across, and he's finally been heard—loud and clear.

Williams is the chief of the Missions Support Division for USASAC at Redstone Arsenal, Alabama. Tucked away in a small office space, he and a two-man team move billions of dollars of surplus military weaponry all over the globe.

It's the Excess Defense Articles (EDA) program, a sort of rummage sale for U.S. allies and partners. Through the program, approved nations can purchase military equipment for pennies on the dollar. This U.S. foreign policy tool allows partner nations to modernize their militaries and strengthen their defenses, supports burgeoning democracies and regional stabilization, and enables allies to support America's shared interests.

That's nothing new.

The bit that has changed, said Williams, is that the process has now been introduced into Army force modernization forums and planning, hosted virtually by U.S. Army Materiel Command (AMC) at Redstone Arsenal, far in advance of its usual execution timeline.

BREATHTAKING COSTS

"Having a seat at the table and knowing when and what the Army is planning for excess equipment X, Y and Z, gives us time to develop courses of action and divest it long before it has to be hauled to a desert depot or processed for demil [demilitarization] at the Army's expense," Williams said.

ARMY SURPLUS
Excess M1117 Armored Security Vehicles travel in July from Kaiserslautern, Germany, to Camp Bondsteel in Kosovo. (Photo by USASAC)

The cost of transporting, storing and demilitarizing excess equipment at U.S. depots is astonishing, numbers that taxpayers would find hard to comprehend, he said.

When the Army retired the OH-58 Kiowa, a highly successful helicopter that saw service from Vietnam to Operation Desert Storm and beyond, most of them were scheduled to be mothballed at the U.S. military's aviation boneyard, Davis-Monthan Air Force Base in Tucson, Arizona.

"The scenario was to take 300 Kiowas—about $3 billion worth of aircraft—spend Army funds to fly them to the desert and put them in storage for eventual demil," Williams said. "It costs $35,000 each to bubble wrap them for extended storage and an [unknown] figure for final demil. There were also about $250 million worth of Kiowa spare parts—some of them brand new transmissions, engines and blades. The cost to cut up these spare parts was another $4 million, so you can see the projected costs. But wait, I had partner nations who wanted these aircraft and the spare parts right away."

BETTER OFF ALOFT

Williams identified 110 of the Kiowas and divested them through USASAC's excess defense articles program to Greece, Tunisia and Kosovo. Because he became aware of the plan for the excess aircraft before they were transported to a depot, he was able to divert many of them to Redstone Arsenal, where USASAC coordinated sustainment maintenance and shipped them directly to U.S. allies at a fraction of the costs, all funded by partner nations.

Not only did U.S. taxpayers net a huge savings, said Williams, but so did partner nations that avoided the costs of reconstituting the aircraft out of storage and preparing them for flight operations.

Williams called the cost avoidance a no-brainer. But it was a game changer, he said, to gain approval from the Army and AMC to participate during the planning for most Army force modernization and divestiture actions.

"Think about it. If I'm aware that the Army is getting a new rifle in 2025, my question is where are the current rifles going? What are the cascading plans and costs?" said Williams. "Because, by the time the military gets rid of an item, they have been talking about the current item and its replacement for six to eight years or more. In that time, I can check partner nation demand signals and have everything lined up before the rifle ever leaves the unit arms room. We can coordinate the money, training and spare parts, support and sustainment—everything we need to successfully execute a case."

BLIND NO MORE

But without visibility, Williams said that the EDA is behind the game every time, at a huge cost to the U.S. Army and taxpayers. "Not to mention missed opportunities to build cost-effective partner-nation capacity."

Williams now sits in on the biannual Army Modernization and Equipping Conference and the monthly total equipment

TITLES, EXPLAINED

Title 22 funds are appropriated to the State Department, and are often transferred to DOD to execute security assistance programs including foreign military sales and the Excess Defense Articles program.

Title 10 funds are appropriated to DOD and are intended for operations and maintenance of the U.S. military.

management strategy meetings, council of colonels and general officer steering committee, chaired by AMC. Visibility gained through these forums allows him and his team the time they need for the complex synchronization of each unique EDA case.

As the lead for the Army's Excess Defense Articles program, Williams has known for a very long time that there was a better way to execute, one that could save the Army millions of dollars, wasted effort and endless headaches.

An added advantage is that the more proactive EDA process complements the Army's new modernization displacement and repair site initiative. These sites, under AMC, are located throughout the United States. Units turn in excess or legacy equipment to reduce sustainment cost and free up space for new force modernization equipment fielding. Once processed into the modernization displacement and repair site, equipment is prepared for reissue to other units by bringing it back as standard issue or transferring it to USASAC "as is" to support EDA cases. The final option is preparation for disposal through the Defense Logistics Agency – Disposition Services.

Gen. Edward M. Daly, commander of AMC, called the modernization displacement and repair site initiative "one of the most important things AMC will do to support Army readiness in the next five years."

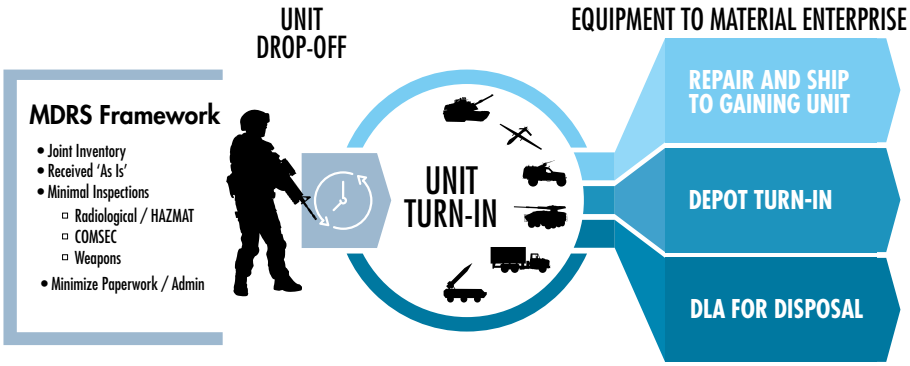
READY TO REARMM

The initiative supports the regionally aligned readiness and modernization model, or REARMM, a unit life cycle process intended to better position the future Army to support the national defense strategy. REARMM is a model that will align units across the Army in a

"We want to free up time and money to spend on today's fight, not yesterday's equipment."

FROM OLD TO NEW

Regionally Aligned Readiness and Modernization Model (REARMM) is a flexible, predictable force generation process that will create an Army that is regionally and functionally capable of supporting the nation's defense strategy. (Graphic courtesy of USASAC)



MATERIEL RECYCLING

Units turn in excess or legacy equipment to the Army's new modernization displacement and repair sites. Once processed, equipment is prepared for reissue to other units or transferred to USASAC as is. The final option is preparation for disposal through the Defense Logistics Agency – Disposition Services. (Graphic courtesy of USASAC)

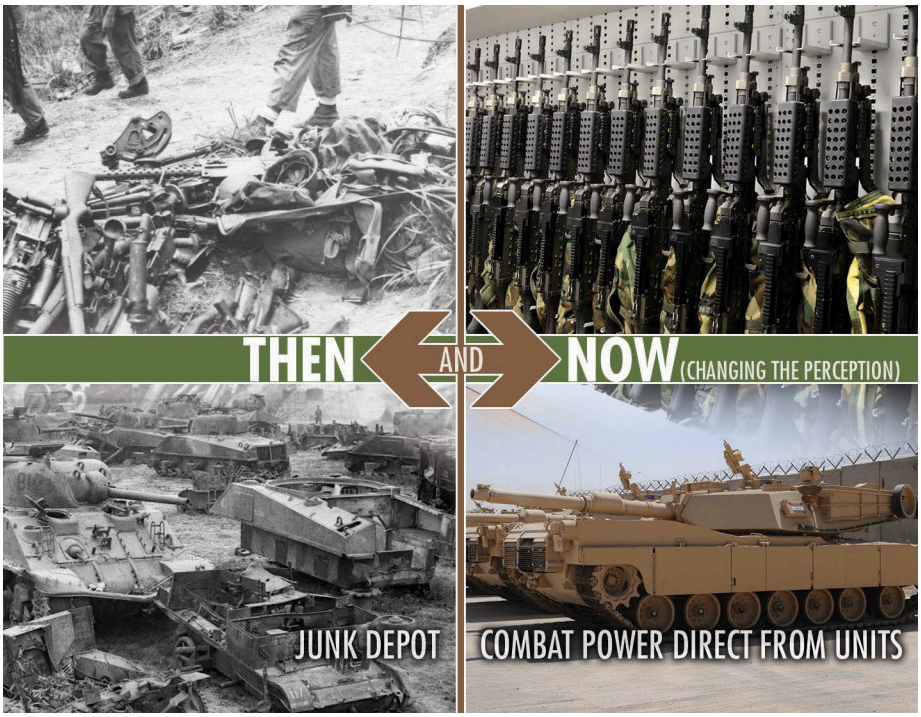
UNWRAPPED, READY TO GO
An OH-58D Kiowa Warrior helicopter, part of an excess defense articles grant, is unloaded in May 2019 at the Greek port city of Volos. (Photo by USASAC)

predictable and sustainable life cycle through training, modernization and mission windows.

Army units are expected to exercise the model beginning Oct. 1, 2022, and will be able to generate and project power during times of competition, crisis and conflict, while simultaneously implementing change through scheduled modernization and training windows, explained Gen. Charles Flynn, former deputy chief of staff for operations, plans and training of the Army Staff, during a general officer rehearsal of concept drill at the Center for Army Analysis earlier this year. He noted that in the modernization window, units can perform a variety of activities including the divesture of excess equipment, conducting new equipment fielding and training and experimenting with new systems.

Williams said the modernization displacement and repair site and EDA programs feed into REARMM by "unburdening the Army of excess items, because any money we spend on excess equipment is money we don't spend on training and modernization. We want to free up time and money to spend on today's fight, not yesterday's equipment."

Recently, the Army planned to divest itself of its M1117 Armored Security Vehicles—shipping them to Sierra Army Depot in California for demilitarization preparation and destruction. The four-wheel-drive vehicles, a more heavily armed alternative to the armored Humvee, were used by U.S. military police and security units in Iraq and Afghanistan. Williams' team identified partners who wanted them and teamed up with Headquarters Army Sustainment Command, European Command G4 (Logistics) and Theater Logistics Support Center to coordinate transport for the vehicles already located in Europe. They were consolidated by Theater Logistics Support Center and diverted to Kosovo. Williams said the initial six "were actually driven from Camp



BETTER THAN A 'BONE YARD'
The Missions Support Division for USASAC at Redstone Arsenal moves billions of dollars of surplus military weaponry all over the globe under the Excess Defense Articles program. The Army recognizes the value in allowing allies and partners to purchase those items, rather than sending them to be stored indefinitely at taxpayers' expense. (Image by USASAC and USAASC)

Bondsteel in Kosovo to a nearby Kosovo army base and transferred—the first direct in-theater transfer done under this new process."

The remaining vehicles for the case were moved by rail from Germany to Camp Bondsteel for follow-on transfers.

CONCLUSION

"These are operational vehicles coming right out of unit motor pools, ready for missions," said Williams. "In the past, the Army would have paid to ship these big-ticket items to a depot, and then paid for storage, demil prep and demil processing while waiting for [Defense Logistics Agency] processing. Any of this equipment that is later identified for allies incurs its own set of costs including transportation back to partner nations."

Williams called USASAC's improved approach to the disposition of excess materiel a professional success milestone. For him, it's also a personal triumph. "I started in the Army, toting a rifle, nearly three decades ago. I've served on the pointy end of the spear and still have many friends there. … So, yes, I absolutely take it personal," he said.

It costs $35,000 each to bubble wrap the retired OH-58 Kiowa helicopter.

"Anytime we can empower our partners to defend their own borders, that means fewer U.S. men and women have to deploy to fight for them. … That's a win. Supporting Army modernization and readiness initiatives allows USASAC to be part of real-world positive impacts for Soldiers on patrol or running convoys in harm's way."

And he wants everyone to hear that, loud and clear.

For more information about USASAC's security assistance and foreign military sales mission, go to ***www.army.mil/usasac****. For more specifics on the Army's EDA program, contact Lem Williams at* ***lemuel.k.williams.civ@mail.mil*** *or 256-450-5697.*

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COMMAND PERFORMANCE

Quinn speaks about the transition from the military and how LinkedIn can be an important tool at the main auditorium of the NCO Leadership Center of Excellence and the United States Army Sergeants Major Academy in April 2018 at Fort Bliss, Texas. (Photo courtesy of Michael Quinn)

Michael Quinn

LEAN, MEAN, TRANSITION MACHINE

For Michael Quinn, retiring from the Army was 'the most difficult year of my life,' struggling to find the right job. But eventually, he created his own job helping others find their next steps.

by Ellen Summey

If you spend much time on LinkedIn, chances are you've heard of Michael Quinn. The two-time LinkedIn "Top Voice" and member of the Forbes Coaches Council has more than 300,000 followers; his posts about military separation and veteran employment are viewed by more than a million people every month. For military service members on LinkedIn—Quinn's key demographic—you can't swing a reflective PT belt without hitting one of his posts. So, how did Quinn go from active-duty Soldier to LinkedIn leader? It all started with a misguided retirement plan.

"I was a military intelligence sergeant major, planning on doing 30 years. I loved everything I was doing. I was at 23 years, there on Fort Belvoir [Virginia], where I was the G-3 [operations and training] sergeant major for the U.S. Army Intelligence and Security Command. The next list of assignments was coming out, and when I brought that list home to my spouse at the time, she said, 'Yeah, I'm not moving.' " Quinn and his family had moved seven times in nine years, "a typical military story," as he put it. "She gave up her career when we got married, she couldn't get a job overseas, she couldn't get a job at El Paso when we moved there for the Sergeants Major Academy for a year, and we finally got back to the D.C. area. We were eight minutes from her family, we had two small kids, we had a house, and she finally had a good job, and she said, 'I'll see you when you get back.' And so, I went from having seven more years, at least, in the Army, to 'I'm getting out in a year.' "

ADJUSTING FIRE

Quinn prepared for his retirement with the dedication you would expect of a career Soldier. He started planning and applying nearly a year in advance, he attended all the Army transition workshops, and he set his sights on high-paying jobs in industry. "You know, I'm pretty

confident in my abilities. I communicate well, I write well, I made it to sergeant major, I was in military intelligence with a TS-SCI clearance, in the D.C. area. I thought it was going to be a breeze. Like I could just walk out, say 'I'm available,' and six figures would be thrown at me."

He can laugh about it now, but he even applied for a job as director of security for the National Football League. Quinn's transition in 2017 was not what he imagined it would be. "I went to my first job fair, prepped to the T as far as I knew. I had a two-page resume that I wrote over a period of weeks and put a lot of effort into, tried out my elevator pitch, wore my best suit, had business cards, everything. I did the research on all the companies there, and over a period of six hours, I watched everyone around me get asked to interview, except for me."

That experience was a wakeup call for Quinn and was the first spark of what has since become a thriving business. "I just dove into LinkedIn. It just made sense to me," he said. "I started reaching out and connecting with people in all different fields, all different companies, all over the country, and just asking, 'Hey, what is your career field like? What's your job like? What do you do every day?' " He was on a mission to market himself in a more effective way. "I started posting content, sharing things that I was doing, thoughts on leadership, writing articles, writing posts. And then I realized, well heck, I was one of the only people from the military on LinkedIn at the time." So he did what a good leader does—he shared his knowledge and skills with his team. He started teaching other service members, first in his own unit and then others, how to share contacts, how to network, how to perform job searches, "and it just kind of steamrolled."

NETWORK IN ACTION

As his retirement date approached, Quinn kept expanding his network and sharing his insights (now under the hashtag #Quinnsights), and then something unexpected happened. "One month before I retired, I was hired as the director of workforce management at a small, federal IT company.

"You've got to prioritize portable careers for military spouses. And I think you've got to prioritize them over veterans."

I literally was introduced to the CEO from another CEO I met via LinkedIn. I went in to just have coffee and he made me a job offer on the spot. He created a director-level role for me." Quinn worked there for about a year, learning everything he could in the role, and when he felt it was time to find the next opportunity, "I started activating my network again." Within four months, he landed an executive role at Big Four accounting firm Ernst & Young (EY)—a feat made no less impressive by his self-professed lack of qualifications.

"I ran People Advisory Services on the Army account for a period of time, and I led our change management training and communications work stream, on what was the government and public sector's largest account, which was Army Audit Readiness," he said. "I mean, literally, I have a Bachelor of Science in liberal arts from Excelsior College. I have no PMP [Project Management Professional], I mean, I don't meet any of the qualifications on paper. I didn't look like other senior managers on paper, but because I got on LinkedIn, because I had a network, because I got face-to-face and spoke with partners, they saw talent. They saw that bringing me to their team was going to bring value, and they told recruiting to hire me."

MEETING A NEED

DOD offers a transition assistance program for active-duty service members, called DOD SkillBridge. It allows service members within their last 180 days of service to work directly for outside employers in training, internship or apprenticeship positions, while retaining their military pay and benefits, for up to six months. "I found out late in my transition about the DOD SkillBridge program, and it was too late for me to use it," Quinn said. As word got out about the program, he started hearing from friends who had applied but weren't placed in internships. One cohort "had 30 credible internships and 90 applicants, so 60 people did not get placed, and they had their hearts set on an internship." When they reached out, Quinn told them to take matters into their own hands. "I said, 'Well, start your own. Find a company that will accept you as an intern, file the paperwork, and you should be golden.' And they looked at me like I was crazy."

It was then he realized, "they don't have connections at companies. They don't know how to explain the Fair Labor Standards Act, and how SkillBridge is not an unpaid internship." And then there is all the paperwork, the legal review and more. "That was where HireMilitary was

TAKING STOCK
Quinn, second from left, speaks at the New York Stock Exchange in 2018. (Photo courtesy of Michael Quinn)

started," in August 2018, Quinn said. Today, HireMilitary is a service that links service members with vetted employers for the DOD SkillBridge program through its own web-based platform. It has grown to include direct job placement for veterans and military spouses as well, and now employs a team of 20 people around the U.S. "We really exploded," Quinn said.

Meanwhile, he was still holding down his day job at Ernst & Young. He knew he had a choice to make. "It came to a point where I left the company, because I figured I could be a better partner to the firm, owning a service-disabled veteran-owned small business, than competing for them as a partner in a large firm like EY."

A NEW FOCUS

Since December 2020, Quinn has been focused on his blossoming company—and it shows. He now has three distinct business units under Tenova LLC, the parent company of HireMilitary. "We've got HireMilitary, which now does both internships and direct placement. We've started taking on select companies [for direct job placement] because we want to focus on making sure they're the right fit and focus on retention. We want to make sure we place people in roles that are great for them and the company. That's for service members, veterans and military spouses."

Quinn and his team also created a Digital Networking Professional Program, which is a certification program that teaches people how to use LinkedIn effectively. "We created the program because there were, almost overnight, tons of LinkedIn coaches, LinkedIn 'optimizers,' LinkedIn lead-generating people, and, I've got to be quite honest, many of them didn't even know what they were doing themselves. I saw a lot of service members paying $1,000 to get a background image and an 'about' section. It was really bad. So we created the [program] out of that challenge." Tenova also does government contracting as a service-disabled veteran-owned small business. "If government agencies want to

BELL LAP
Quinn, left, with Timothy Cochrane from American Corporate Partners at the New York Stock Exchange in July 2018. (Photo courtesy of Michael Quinn)

contract for staffing or support, or if they want training under [the Digital Networking Professional Program], then as a service-disabled veteran-owned small business, we're able to support that. We're also able to act as subcontractors for other contractors that need help filling roles or want to bring our specific experience into their team."

IMPARTING WISDOM

When asked what advice he would give to an auditorium full of active-duty service members, Quinn stressed the importance of getting an early start on the transition process. "I think the transition takes longer than a year. And if you don't start it before you get out, you're going to face it after you get out. My advice to everyone is start early. You have to figure out what you want to do, where you want to do it, what you're qualified to do, if you need to earn additional certifications, if you need to go finish your degree—all of that takes time."

The Army does provide support for transitioning and retiring Soldiers, through the Transition Assistance Program (TAP), but Quinn said it is not enough for most people. "Everyone gets ready to transition and they think that TAP is enough to get them transition-ready. And that's impossible. It is to give you the *minimum* that you need to transition. And I just think a lot of people don't realize that until it's too late," he said. According to a 2019 Pew Research report, 75 percent of transitioning Soldiers leave the service without having a civilian job lined up, and Quinn said more than 50 percent leave their first post-Army jobs within a year. "Some of that is that they got promoted, but some is that they took a job they didn't want. They took a job to get a job, not to find a career."

MANAGING TALENT

Though Quinn is now an expert on getting *out* of the Army, he said he understands how the service can better support Soldiers and families to keep them *in* the Army. It comes down to two key points: recognizing and more effectively utilizing the many talents of Soldiers already on the force, and providing portable careers and prioritizing employment for military spouses on bases.

"First, you really need to do a better job of capturing all the skills, and I think we're trying to do that," he said. The new Integrated Personnel and Pay System – Army (IPPS-A) and Army Vantage are just two such efforts to bridge those gaps, in alignment with The Army People Strategy.

"And second, you've got to factor military spouses into the equation," Quinn said. "You've got to prioritize portable careers for

military spouses—not just those jobs at the PX or the commissary. And I think you've got to prioritize them over veterans. … It's a national security issue, and we're not providing these opportunities, and a lot of talent is leaving the service."

Executive Order 13473 and the DOD Priority Placement Program for military spouses allow federal agencies to make noncompetitive appointments of military spouses who meet certain criteria. However, a 2021 report by the National Military Spouse Network revealed that military spouses still face a 25 percent unemployment rate, and an additional 35 percent of spouses say they are overqualified for the jobs they hold. As Quinn can personally attest, military spouse employment is a major driver of retention among the active-duty ranks. "I would still be in the Army today had my spouse had a portable career," he said. "Everything worked out fine, I'm happy where I am now, but I got out because my spouse decided she wasn't going to move anymore."

CONCLUSION

For Quinn, creating a successful transition from active duty is perhaps the most overlooked and misunderstood facet of military recruitment and retention. For Soldiers who struggle during transition or retirement, the loss of income, health care and stability can serve as a deterrent to others who may have otherwise considered a career in the Army. As Quinn said, when a family sees their loved one facing those bleak circumstances, "no one in their family is ever going to enlist again."

The transition from active duty is no less important than any other part of a Soldier's career, and Quinn said it requires the right mindset. "You can look at it and be scared, you can avoid it, or you can get excited about it," he said. "If you can get excited about the

As his retirement date approached, Quinn kept expanding his network and sharing his insights.

BEYOND THE PROFILE

So, you've created your LinkedIn profile. You uploaded a professional photo of yourself, wrote a compelling summary, added your work experience and education, and you even found a nice background image to add some personality to your online presence. What next? Quinn shared his top three tips for getting the most out of LinkedIn (start with his article, "The Ultimate LinkedIn Cheat Sheet").

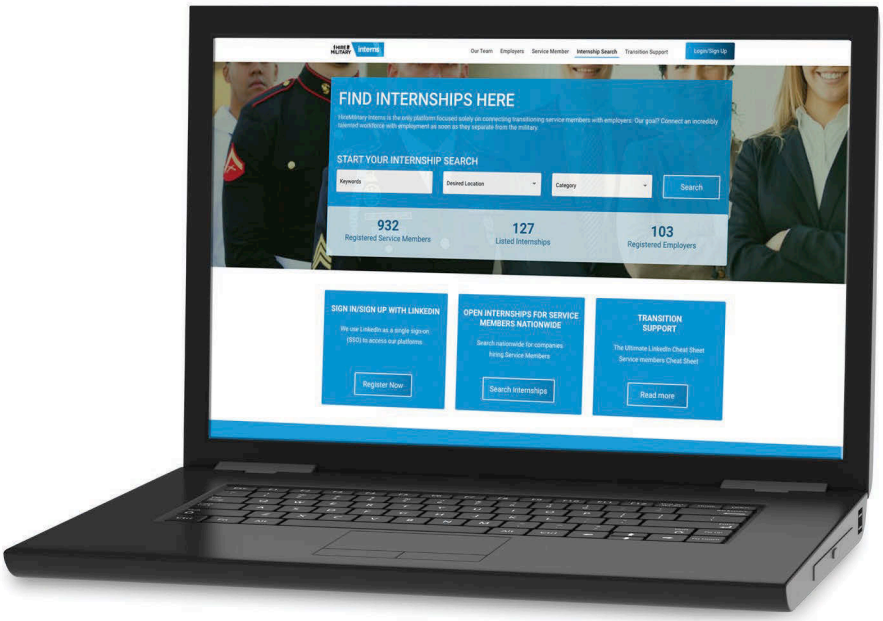
Make it a habit. "Every morning, I grab my cup of coffee, I sit down and scroll through LinkedIn. If I see an article that resonates with me, I drop a 'like,' and I throw a quick comment on there. That starts to build touch points and relationships with the people in my extended network."

Add to the conversation. "A couple of times a week, I tell people, 'Share something. Find an article you like, grab a photo where you're at, just share something.' You don't have to write a 1,300- or 3,000-word article, it can be a few sentences on what you're sharing. When you share that, it creates additional touch points with your network that are content-related. It feels like you're checking in with the people in your network, so nobody goes stale."

Reach out. "Once a week, make it a point to send out some connection requests, either to people in companies or industries or roles that interest you, so you're consciously expanding your network, expanding those left and right limits so that you're reaching a different audience and getting different perspectives."

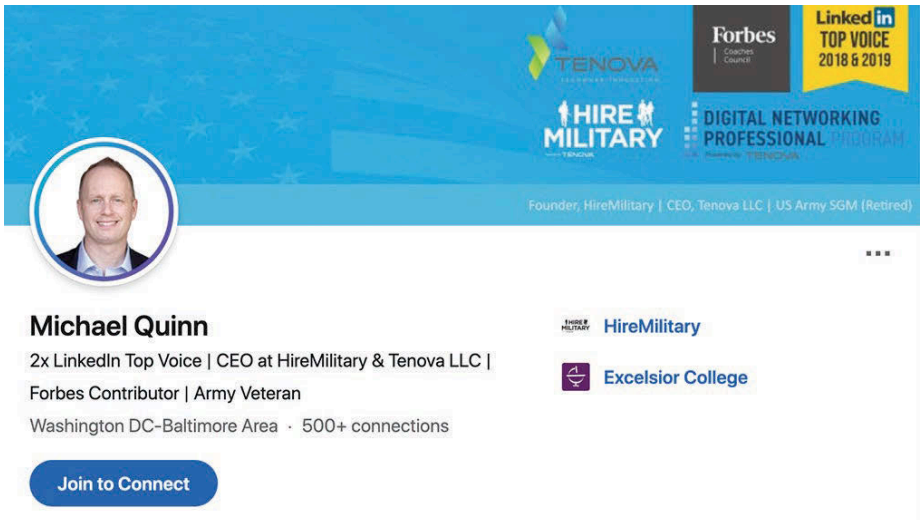
"Maybe five or 10 minutes a day, over time, will be cumulative and you'll start to create that brand, to a point where it's less stressful and you'll start to have those conversations. But when it's time to transition, you can focus on doing the things you need to. You already have a network and an idea of what you want to do, ready to go. The transition is much less stressful when you have a team of mentors, when you know what you want and are qualified to do, and really can just start activating that network to find the right opportunity for you. But when you try to jam that all into six months, it just becomes a hodgepodge. It's overwhelming, and so few people do it well."

—ELLEN SUMMEY



YOUR TURN TO INTERN

On the HireMilitary website, Quinn and his team link service members and spouses with vetted employers for the DOD SkillBridge program and direct hire opportunities.



LINKING UP

Quinn provides military transition-related resources and advice on his LinkedIn page. He and his team created a certification program that teaches people how to use LinkedIn effectively.

"I think the transition takes longer than a year. And if you don't start it before you get out, you're going to face it after you get out."

transition, get excited about the opportunity to choose, get excited about the ability to carve your own path, to start over, or to find a new ladder to climb. If you can change your mindset to one about creating opportunity … then you will find your success," he said. "It's about creating a mindset that sees it as an opportunity to continue growing, as an opportunity to start your next career, and *you* get to choose."

For more information, go to ***hiremilitary.us*** *or follow Quinn on LinkedIn at* ***linkedin.com/in/quinnmi****.*

ELLEN SUMMEY provides contract support to the U. S. Army Acquisition Support Center at Fort Belvoir, Virginia, as a writer and editor for SAIC. She holds an M.A. in human relations from the University of Oklahoma and a B.A. in mass communication from Louisiana State University. She is certified as a Project Management Professional, Change Management Professional and User Experience Manager, and has more than 15 years of communication experience in both the government and commercial sectors.

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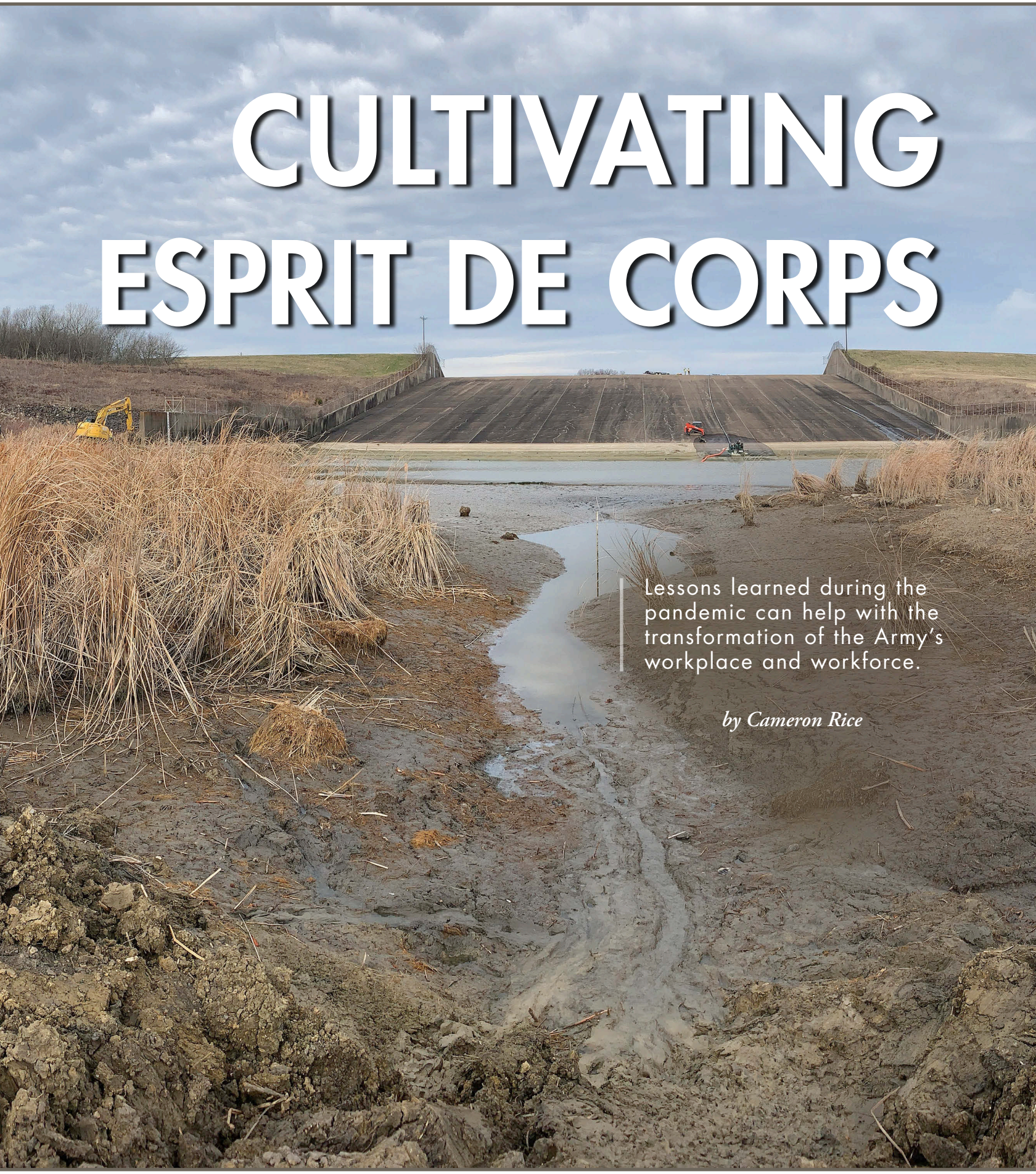
CORPS AT WORK

Despite the challenges of COVID-19, the U.S. Army Corps of Engineers has kept pace with its mission. In February, the Corps worked with the Texas Parks and Wildlife Department to locate, identify and move aquatic wildlife in an Ennis, Texas, lake before conducting maintenance on the spillway. (Photo by Trevor Welsh, U.S. Army Corps of Engineers Fort Worth District)

CULTIVATING ESPRIT DE CORPS



Lessons learned during the pandemic can help with the transformation of the Army's workplace and workforce.

by Cameron Rice

As of this writing in the summer of 2021, more than 50 percent of adult Americans are fully vaccinated against COVID-19 and, it appears, life will be going back to normal, or a normal of sorts. Businesses will resume their normal hours and operations, schools will start a new year in the fall with possible in-person attendance, and families will have celebrated Independence Day and Labor Day in larger gatherings than last year.

Still, returning to normal as life was pre-COVID is not as simple as flipping a switch. The experience will be different for everyone depending on a variety of factors beyond just vaccination status. Those who lost loved ones during the pandemic may experience post-traumatic stress associated with resuming everyday functions. Those who, before the pandemic, already faced social anxieties may now find those anxieties beyond controllable. That's only one facet of the effects of the pandemic on society.

As a country, we may be exiting the COVID bunker, but a new day has dawned, and things will never go back to exactly how they were before the first infections. Additionally, there is the stark reality that the pandemic is still going on with the spread of variants. Therefore, a return to normal isn't possible until the pandemic is completely over, which is a timeline that appears impossible to forecast. The pandemic, by itself, was a catalyst for change and, because the effect on many was at such a personal level, the reaction to that change is going to be varied. These varied changes are causing a cultural change throughout business, government, education, religion and other aspects of life.

A COMPLEX ENVIRONMENT

These variable changes are exacerbated in organizations that have large and wide-ranging sets of functions, such as DOD and the U.S. Army Corps of Engineers. The Corps' mission touches all 50 states, 90 countries, and supports more than 150 Army installations, as well as 90 Air Force installations worldwide. In addition to this worldwide footprint, the Corps' missions include operating over 600 dams and 250 navigation locks, and supporting over 12,000 miles of commercial inland navigation and more than 900 harbors; these numbers equate to the Corps of Engineers addressing all components of navigation for a waterway almost half the circumference of the Earth. Besides the sheer size of the mission, the Corps also interacts with all levels of government, ranging from municipalities to state to federal agencies, within all 50 states and with multiple layers of government in foreign countries. When the pandemic began, the Corps quickly found that this catalyst and the response to this catalyst could drastically change the workplace and workforce within the Corps for the perceivable future.

The Corps, as well as many other federal agencies, has been a traditional office workplace dominated by a physical presence. Yet the massive change in the employee-employer relationship caused by the pandemic meant that employees have shown that they can accomplish the mission from any location. Many federal agencies recognized this new advantage; employees were not bound by an onsite office and many employees found their new flexibilities in work location and hours liberating. Additionally, the Army began to recognize that by removing the need for onsite work, there could be considerable savings because of reduced overhead and maintenance. As in most cases, the answer isn't a simple one, such as declaring that all office workers should be remote workers, to allow the Army to stop paying for office space. The decisions involved with workplace and workforce transformation have ramifications that ripple through every organization and every facet of employee-employer relationships.

For example, the Mississippi Valley Division of the Corps of Engineers reaches from Canada to the Gulf of Mexico and covers 370,000 square miles with portions of 12 states bordering the Mississippi River. The division services more than 28 million people through the work of six districts located in Minnesota, Illinois, Missouri, Tennessee, Mississippi and Louisiana. If, through the process of adapting to the new normal, the Mississippi Valley Division made the decision to consolidate certain physical locations, this could upset many local leaders, current employees who live in those physical locations, the unions that represent those employees, and those who rely on our business, such as the General Services Administration, which leases many of the Corps' office spaces.

This example illustrates the necessity for a detailed plan describing the approach required to return to the office without alienating key stakeholders. If we do not engage in a deliberate way, organizations such as the Corps of Engineers run the risk of losing trust, which is essential to mission accomplishment. At this time in our response to the pandemic, many senior leaders are all asking the same question: What should an approach to the next normal look like and what timeline is associated with this response?

A DELIBERATE APPROACH

The primary approach used by organizations during the pandemic involved mission command and decisions made locally to keep a mission on track. This approach may have been appropriate during the first phases of the pandemic, but it might not be sufficient for building the foundation for future success. According to Army Doctrine Publication 6-0, "mission command" is the Army's approach to command and control that empowers subordinate decision-making and decentralized execution appropriate to

COMMAND PERSPECTIVE
Tom Lavender, project manager at the Corps office on Dover Air Force Base, Delaware, discusses aircraft hangar construction with Lt. Gen. Scott A. Spellmon, U.S. Army Corps of Engineers commanding general, April 7. To attract and retain top talent, Corps leaders must communicate clearly and offer competitive telework and remote work arrangements to staff members. (Photo by Airman 1st Class Faith Schaefer, 436th Airlift Wing Public Affairs)

the situation. Further, mission command stems from the Army's view that war is chaotic and uncertain such that no plan can account for every eventual outcome.

During the early stages of the pandemic, this approach was well suited, especially for organizations such as the Corps of Engineers, because of the variety of local conditions faced by subordinate leaders. Initially, the belief was that these responses would be stopgap measures to react and ensure mission accomplishment before resuming normal operations. Over the duration of the pandemic, however, the need for mission command has decreased as reality has set in: The next normal will require cultural change and necessitates a careful and cautious approach that involves a broader audience than in years past.

The framework for such an approach already exists with The Army People Strategy, which was published in October 2019. This strategy outlines four lines of effort: acquire, develop, employ and retain talent to achieve strategic outcomes. Additionally, culture is one of the three key enabling objectives and, considering that this was written before the pandemic, the importance of culture has increased drastically. Furthermore, the strategy emphasizes to leaders that the new culture must be people-focused, and it eliminates harmful behaviors while building trust through leaders modeling the change and communicating it openly.

UNEXPECTED OPPORTUNITY

The response to the pandemic and the development of the new normal is the perfect opportunity to initiate the people-focused strategy. For example, the telework policies and exemptions allowed during the pandemic effectively removed many barriers to entry for a variety of individuals. The single parent could now continue to do their job from home remotely while managing their family life. Before the pandemic they may have had to choose between work and family. This would either cause the organization to lose a valued member who brings a different perspective to an organization or cause an employee to build resentment at the loss of work-life balance. The response to the pandemic and the facilitation of this people-focused culture allows all organizations to repair these divides between employer and employee and create the conditions for trust to develop. Leaders can operationalize this opportunity to evolve their business practices in order to get and keep the best people in a competitive talent management marketplace.

One such aspect involves the fiscal pressures associated with maintaining and recruiting in an area that has a high cost of living. Locality pay can drive many of the business decisions within the Corps of Engineers because the Corps has some districts in very high locality pay areas. U.S. government employees receive both base pay and locality pay. The latter is based on the expense of living in a given area. For example, the locality pay in San Francisco, where one Corps district is located, is 41.44 percent, while the locality pay in Chicago is 28.59 percent. The national average is 15.95 percent. Organizations in higher locality pay areas have a business incentive to reduce costs by reducing the number of employees who live and work within their locality pay areas. Therefore, their decisions to embrace more workplace flexibilities, such as remote work, may have wide-ranging impacts that force other organizations

to adopt such policies in order to remain competitive in mission execution, talent acquisition and employee retention. The ripple effect is that organizations in outlying areas, like the Corps district office in Vicksburg, Mississippi, may not move as quickly toward remote work or telework because the local conditions do not incentivize nontraditional workplace initiatives.

COMPETING FOR TALENT

Leaders in Vicksburg should recognize the necessity of change by adopting some of the approaches that the higher locality pay organizations are using in order to remain competitive for top talent. They will need to embrace these changes in order to retain their top talent that may drift toward the more expansive policies that these other organizations offer. The best course of action is to follow The Army People Strategy by placing the recruiting, retention and well-being of all employees at the forefront with a timeline that works for all organizational cultures involved.

Additionally, the Corps of Engineers faces decisions about training. Traditionally, training within the Corps is run by the Corps of Engineers Learning Center in Huntsville, Alabama. This center coordinates with experts within the Corps and serves as a hub to connect the demand for training with the facilitators. During the pandemic, the learning system went 100 percent virtual. The impact for the Corps was unforeseen cost savings.

Typically, the tuition is not expensive, but districts spend twice that amount to get the individual to the training location. Once tuition, travel and TDY expenses are combined, the Corps spends more than $45 million a year just to ensure that training occurs in a physical location. During the pandemic, the cost savings resulted in more than $30 million that could be reallocated to more virtual training or

NAVIGATING UNCERTAINTY

The Corps of Engineers operates more than 600 dams and 250 navigation locks, and supports over 12,000 miles of commercial inland navigation and more than 900 harbors—addressing all components of navigation for a waterway almost half the circumference of the Earth. (Photo by Carol Vernon, U.S. Army Corps of Engineers Pittsburgh District)

CORPS STEM

Kaspala Garrett and Neil Tugaoen, left, engineers with the U.S. Army Corps of Engineers, answer students' questions during a presentation Feb. 22 at BASIS Phoenix Central Elementary School. Government employees in the Phoenix metro area receive locality pay of 20.12 percent in addition to their salary. Allowing employees to work remotely from less expensive areas may allow the Corps to reallocate that funding to training or projects. (Photo by Robert DeDeaux, U.S. Army Corps of Engineers, Engineer Research and Development Center)

COST OF DOING BUSINESS

Lt. Gen. Scott Spellmon, U.S. Army Corps of Engineers commanding general, joined Command Sgt. Maj. Patrickson Toussaint and Lt. Col. Rachel Honderd on Jan. 5 at the Environmental Laboratory in Vicksburg, Mississippi. Corps districts in lower cost of living areas, including the Vicksburg district, must adapt to telework and remote work as quickly as those in more expensive areas. (Photo by Dakota Pope, U.S. Army Corps of Engineers, Engineer Research and Development Center)

to other investments. As the pandemic abates, the discussion is now about the right mix of in-person and virtual classrooms. Although the virtual setting resulted in considerable savings, leaders must analyze what is lost by not having in-person interactions.

FAIR IS FAIR

The main friction point between supervisors and employees involves ensuring equity. Inconsistencies were common during the response to the pandemic as supervisors reacted to the needs of the mission. Some offices were 100 percent virtual for the last 15 months while others encouraged individuals to return as soon as possible, which may have created hardships due to dependent care not being available. In other cases, some supervisors required a daily report from their employees while other supervisors evaluated employees based upon work output. Regardless, the Corps recognizes that these inconsistencies should not continue in the next normal. True equity among all offices within an organization will be difficult to achieve, but helping employees and supervisors understand how telework will involve other team members in the next normal will be essential for success.

CONCLUSION

The culture has changed, not because of a deliberate decision by leaders, but because of a pandemic. This process of cultural change is less about getting the procedural aspects and administrative changes correct and more about participating in deliberate decisions that can have generational impacts. History will judge the leaders of today on whether they use all resources and opinions to develop a more progressive workplace and a workforce that is agile and adaptive to future events. The enormity of these decisions creates fear and hesitation in many leaders. Some leaders fall back to a position of comfort—the office space that was left behind when the pandemic began. One approach to handling these fears is a deliberate process to address concerns with the next normal, so that leaders can be more willing to accept the culture change that is occurring.

The core truth is that the next normal is not something that can be handled solely with new policies and procedures, but must be tackled in a holistic manner on a realistic timeline. The goal within this cultural change is not to create a completely virtual workforce. Rather, it is to create a culture in which mission accomplishment, the voice of the employee, and the role of the supervisor are treated with parity such that esprit de corps evolves as a natural byproduct.

For more information, contact the author at ***thomas.c.rice@usace.army.mil****.*

CAMERON RICE has over 15 years of federal service, including 10 years in uniform as an Army infantry officer. He holds a Master of Public Administration degree from Columbus State University and a B.S. in business administration and management from the United States Military Academy at West Point, where he earned his commission. As an Army officer, he conducted various assignments around the world, including deployments to Iraq and Africa. After leaving the service, he worked in private industry for two years before returning to federal service with the Corps of Engineers, where he is currently the strategic planner for the Mississippi Valley Division.

CLEAN SWEEP
The Roomba, a now ubiquitous floor-cleaning robot, is perhaps the biggest success story to come from the SBIR program—but it lacks practical application in a military setting. (Photo by Getty Images)

BUSINESS BREAKTHROUGH

The AAL's four tenets for businesses wanting to work in the Army's 'four-letter word' program—SBIR.

by Dr. Casey Perley, Scott Stanford, Stephanie Hill and Joshua Israel

For years, Congress and the defense establishment have sought a better return on investment (ROI) from the Small Business Innovation Research (SBIR) program, both for the DOD and for companies on SBIR contracts. The Army SBIR program is designed to provide small, high-tech businesses the opportunity to propose innovative research and development solutions to critical Army needs. The return to great power competition has increased the stakes beyond ROI.

In recent testimony, Barbara McQuiston, then the official performing the duties of the undersecretary of defense for research and engineering, said of SBIR, "We have to be able to work at the speed of commercial flexibility because we don't want to just be able to understand what their technology is, *we need to be able to capitalize on it and field these systems for the warfighter*" (emphasis added). McQuiston, who launched a DOD innovation steering group in April, added that "we have to move at speeds that are within a commercial timeframe."

Congress and senior Pentagon officials, including Deputy Secretary of Defense Dr. Kathleen Hicks, who directed the formation of the steering group, are eager for SBIR to result in fielded capabilities. Rep. Ken Calvert, R-Calif., has even proposed legislation requiring service secretaries to identify promising SBIR technologies for inclusion in future budgets. For SBIR to be successful, though, changes must be made at the base of the pyramid, far below service secretaries, about what technologies enter the program and how they will contribute to DOD priorities.

The Army SBIR program distributes more than $300 million a year in contracts to U.S.-based small businesses; the other services across DOD distribute hundreds of millions more. Yet despite this, the biggest DOD SBIR success story in its 40-year existence is perhaps putting the Roomba under the cat in your living room—a viable technology,

but with no application to DOD needs. SBIR is not tied to a specific budget activity code, and unlike programs of record, SBIR projects do not need to be laid out in the congressional budget years before a program manager even knows if a technology can contribute to her or his program.

SBIR does not measure the outcomes of the programs it funds—whether there has actually been "innovation"—but rather the number of those programs. SBIR can be a very potent innovation and modernization tool, and the Army Applications Laboratory's (AAL) Special Program Awards for Required Technology Needs (SPARTN) program has proven how. AAL, a subordinate of Army Futures Command, discovers and delivers current and emerging technologies and applies innovation best practices to warfighter needs.

SPARTN has done this for SBIR. SPARTN has reduced application requirements by 50 percent for businesses wishing to participate, has increased cash paid to small businesses, and has cut award notification and contract timelines by 78 percent.

SPARTN demonstrates that SBIR can be a viable entry point for small businesses and a powerful tool to fill critical modernization gaps while reducing costs and accelerating transition.

A year and a half since SPARTN's launch, eight solicitations (commonly called topics) are in or are just exiting the contracting stage, and five more will follow in the coming months. These topics represent the specific technology needs of six cross-functional teams and seven program managers, many of whom hadn't considered using SBIR to solve their problems before SPARTN.

DELIVERING VALUE

Before SPARTN and other initiatives to update the program such as at the newly formed Applied SBIR office in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, SBIR appealed mainly to a small handful of companies that had cracked the code on how to win contracts through the program.

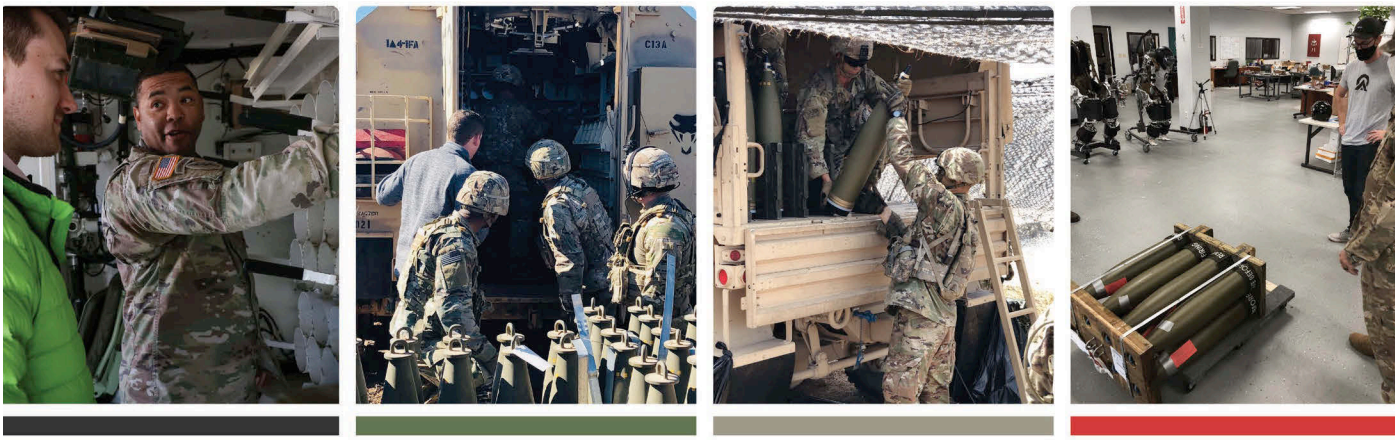
A shocking statistic to illustrate this point: Nine companies have combined to win more than $2.5 billion in SBIR contracts. The small businesses the Army hopes will help solve its modernization technology needs have not been participating, and inertia in the SBIR program has resulted in an institutionalized preference for companies set up to win SBIR contracts irrespective of whether or not those contracts result in value to the government.

TOUCHDOWN

SPARTN puts an emphasis on early feedback and hands-on experience by Soldiers, and provides businesses with access to relevant government information. (Graphic by AAL)

	AAL SPARTN PROGRAM	TRADITIONAL ARMY SBIR
 SOLDIER AND KEY STAKEHOLDER TOUCH POINTS	— Occur in Phase I. — Connect solvers with soldiers *(in the field, when applicable).* — Round tables. — Office hours. — Outbriefs to key stakeholders.	No uniform standard
 GOVERNMENT FURNISHED EQUIPMENT AND INFORMATION	— Diagrams, system specifications, and equipment provided as needed.	No uniform standard

SPARTN IN ACTION: THE FIRE FASTER COHORT



SEP-OCT 2020

FIRE FASTER TOPIC FORMS

Topic developed with LRPF CFT and PM SPHS, and AAL began to conduct marketing outreach. In total, 54 companies applied and—within just six days—were notified of a decision, while 15 awardees were on contract within 30 days.

NOV 2020

MONEY IN, HANDS ON

Within 39 days, companies were able to invoice for $100,000 and travel to Fort Hood, Texas. Solvers and stakeholders experienced what it is like inside a Paladin as it fires and gained direct perspectives on the existing problem from Soldiers.

NOV 2020-MAR 2021

ONGOING COLLABORATION

Experts and stakeholders conducted weekly office hours and roundtables with the solvers. Mid-term progress briefs for concept review and final outbriefs were also delivered to the CFT director, PM, ASA(ALT) and other Army representatives.

APR-JUL 2021

A CLEAR PATH FORWARD

Five Fire Faster companies were chosen for follow-on work and were notified within four weeks of cohort completion. Four companies had complementary solutions, and 40 percent of the companies brought matching funds. Phase II kicked off in July.

KEY
CFT: Cross-functional team **LRPF:** Long-range precision fires **PM SPHS:** Product Manager Self-Propelled Howitzer System

CASE IN POINT

The Fire Faster Cohort was a pilot SPARTN effort to leverage small businesses to increase the rate of fire of self-propelled howitzer systems. (Graphic by AAL)

In addition, capital moves too slowly in the Army SBIR program, making it a risky proposition for small businesses with limited financial runways. It would take 8.5 months on average, from the submission of a proposal until a business received the first payment. Real innovators, the kind DOD needs to help fill its capability gaps, will not wait this long to get paid. In fact, they cannot. And investors have been clear that a program with these characteristics is not a realistic opportunity, and they have steered promising companies away from it.

It isn't only a challenge for businesses. The Army cannot accept administrative inertia in a program it uses to fill critical modernization technology gaps. It can take more than 14 months from the time Army stakeholders propose a SBIR topic until a contract is signed to begin work solving an Army problem. Entire technologies can come and go in the time it took SBIR to produce nothing more than a contract.

AAL started with a simple question: What do companies need from the Army to make it an appealing market for commercial solution providers? The answer has enabled SPARTN to rewrite the SBIR playbook to make the Army a better business partner for small technology firms.

AAL gleaned the answers through extensive, direct engagement with businesses, investors, accelerators, aggregators and other

	AAL SPARTN PROGRAM	TRADITIONAL ARMY SBIR
NOTIFICATION TIME The average time it takes from application close to Phase I award announcement.	14.8 Days	78 Days
CONTRACT TIME The average time it takes from notification to get companies on Phase I contracts.	49 Days	224 Days
BASE AWARD The total dollar amount available to companies that receive Phase I contracts.	$150,000 to $200,000	$111,500
PAYMENT SCHEDULE Determines how companies can invoice and receive payment from the Army.	Deliverable-based	Time-based
MATCHING FUNDS When the SBIR Enhancement Program allows companies to match funds.	At time of Phase II application	End of Phase II
PHASE II AWARDS Potential award amount for SPARTN Phase IIb or Army SBIR second Phase II.	$$$$$$$$$$$$ $$$$$$$$$$$$ Up to $24,000,000	$ Up to $1,100,000

COMPARE AND CONTRAST

The SPARTN program has shortened timelines and enhanced funding opportunities, creating measurable improvements over the traditional SBIR program. (Graphic by AAL)

parts of the commercial tech ecosystem. While the difficulties they expressed apply broadly to DOD as a business partner, SPARTN was able to address them in the SBIR program largely by removing self-imposed restrictions. None required changes in laws or authorities.

The four key tenets to make the Army a viable business partner are:

- Potential for long-term revenue and long-term relationships.
- A level playing field for companies that don't regularly work with DOD.
- Sufficient capital moved at the speed of business.
- Access to government-furnished information, key stakeholders and users.

These tenets not only represent what companies need when doing business with DOD, providing these basics also enables and incentivizes companies to create better solutions to Army modernization challenges. Consequently, some Army stakeholders who used to view SBIR as a four-letter word are beginning to use it to solve some of their most vexing technical problems.

LONG-TERM REVENUE AND RELATIONSHIPS

SPARTN topics offer only two paths for companies on contract: transition to follow-on contracts or early offramp of technologies without transition potential. It eliminates the third option: a limbo in which companies wait, and hope, for funding as a program of record or part of one.

AAL works with cross-functional teams (CFTs) and program managers to identify and frame SPARTN problems important to them and to the Army. No SPARTN topic has ever been released without personal endorsements from both the CFT director and the program manager. Their endorsement is a pledge to be involved in the entire process, from problem framing and company selection through to transition or offramp, ensuring the right people make decisions on technology investments and companies have continuous access to the problem and to problem owners.

AAL gains insight into their acquisition timelines and can tailor timelines and funding under contracts accordingly. Traditional Army SBIR has used a one-size-fits-all Phase I contract in which the funding amount and a three-year timeline for development through prototype are set from the start. SPARTN's technology-specific funding and flexible periods of performance enable stakeholders to plan for funding continuity so technologies do not sit in limbo for two or three years waiting to be included in the program objective memorandum—the "valley of death." (See related article, "Understanding Acquisition: The Valley of Death," Page 92.)

What do companies need from the Army to make it an appealing market for commercial solution providers?

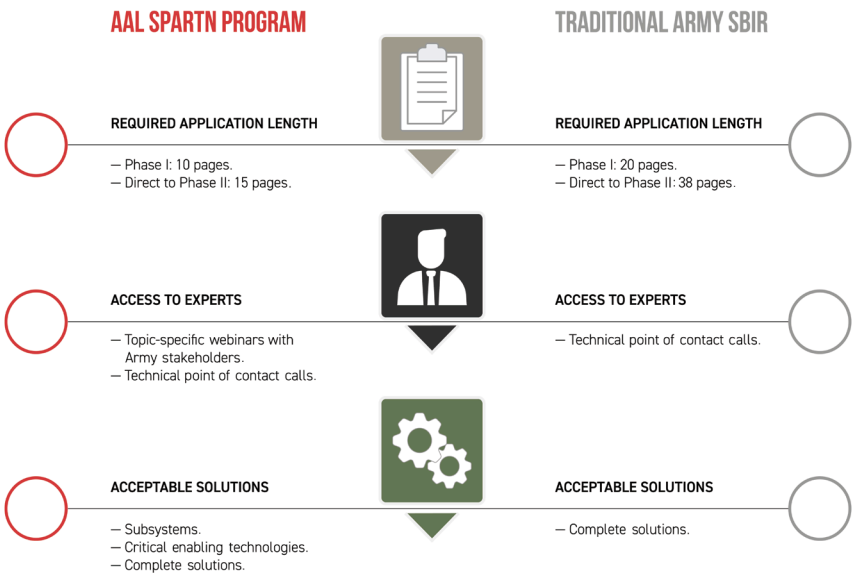
LEVEL PLAYING FIELD

SPARTN topics receive an average of four times as many applications as traditional Army SBIR, according to data from the Office of the Secretary of Defense SBIR portal. Outreach for the program happens across a range of digital channels, including Instagram, LinkedIn and Twitter. This outreach emphasizes the problem to be solved—allowing solvers to understand where their company fits into the Army's needs—rather than discussing how the SBIR program works, as the Army SBIR website had done before its favorable redesign in July. When AAL increases commercial awareness of Army problems and provides resources specifically to help companies through the application process, it matters.

Another reason SPARTN applications are way up is that AAL rewrote SBIR application requirements, simplifying the language and decreasing the technical application length by more than 50 percent. If a company doesn't apply for a SPARTN topic, it should be because its technology isn't relevant, not because life is too short to go through the process.

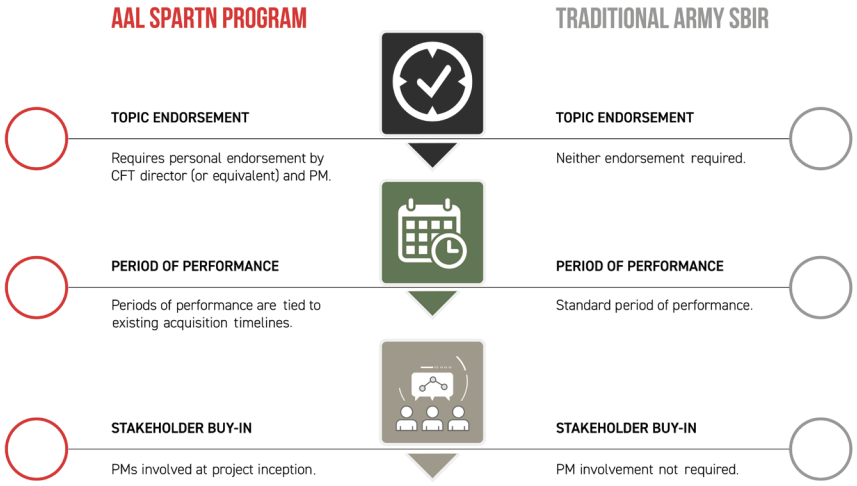
AAL presumes that companies interested in working with the Army have no knowledge of Army structures or systems. SPARTN problems are broad, presented in plain language, devoid of jargon and designed to allow commercial problem solvers to propose solutions the Army hasn't thought of yet. The difference between "build an autoloader for field artillery" and "how can we make field artillery fire faster" creates a world of potential solutions. Companies can attend webinars where technical specifications and application requirements are laid out and complex military processes are explained by experts.

As a result, SPARTN portfolio companies with little prior DOD experience were nearly five times more likely to receive follow-on awards than companies whose primary business was SBIR. More companies now see the Army as an attractive and approachable business partner: 44 percent



BARRIERS TO ENTRY

By reducing the paperwork burden, providing more practicable information from experts and allowing a wider array of proposed solutions, SPARTN makes it easier for companies to do business with the Army. (Graphic by AAL)



TOP COVER

The SPARTN program links its topics directly to CFT and program manager needs and involves stakeholders throughout the process so that outcomes will be more beneficial to DOD. (Graphic by AAL)

of SPARTN portfolio companies were new to their Army stakeholders and 93 percent of applicants would recommend SPARTN to colleagues, as measured by AAL's net promoter score surveys.

OPEN ACCESS

Problem solvers must understand the problem intimately, and that requires a close relationship between solvers, scientists and Soldiers. It also requires that companies have access to critical information about the problem, like engineering specifications. Firsthand experience helps companies adjust their concepts and prototypes to incorporate newly discovered insights.

SPARTN always includes a range of Army stakeholders and experts such as requirements writers, scientists, engineers and capability development integration directorates who contribute expertise and capture lessons learned in SPARTN's holistic project management approach. This ensures the Army doesn't waste taxpayer money repeating mistakes or building requirements for "unobtainium" by neglecting to learn from technologies that didn't pan out.

SPARTN IN ACTION

The Fire Faster Cohort is an example of applying the AAL model to SBIR with SPARTN. Fire Faster supports Product Manager Self-Propelled Howitzer Systems and the Long-Range Precision Fires (LRPF) CFT. It is part of an ACAT-1 program, one of the most significant programs in the Army, reflecting the potential of a business-relevant SBIR program

Fifteen small businesses were selected for Phase I contracts to develop proofs of concept for novel solutions to increase the rate of fire of the M109 Paladin self-propelled howitzer system. They were asked to apply their own expertise and

CONTRACTS AND CAPITAL

The Army's Small Business Innovation Research (SBIR) program follows a generic and prescriptive process that gets companies on contract an average of 224 days from the time they submit their proposals. This rigid structure makes the program easy to manage, but it is not efficient for companies or for Army stakeholders.

The Army Applications Laboratory's (AAL) Special Program Awards for Required Technology Needs (SPARTN) program is the only Army SBIR program to tailor base contract award amounts specific to each topic. The funding amount is derived through tailored base contracts, the SBIR enhancement program, high-dollar value Phase IIb contracts and faster contracting speeds. AAL identifies where commercial technology is mature enough to skip the standard proof-of-concept contract stage, and allows companies to enter the program on higher value Phase II prototyping contracts. SPARTN can also award different companies Phase I and Phase II contracts simultaneously for the same topic, which allows the Army to pursue the most promising technologies for a program when companies have relevant solutions at different maturity levels. Traditional Army SBIR did neither of these, making companies apply for Phase I and then Phase II contracts regardless of the maturity of the technology.

SPARTN is also the only Army program that offers SBIR Phase IIb awards. These contracts are a cost-sharing measure between industry and the Army that drive down the Army's development costs. Companies use matching funds—both from the program manager and the company—for a contract of up to $24 million total value. This additional funding can accelerate project delivery timelines and help companies develop technology to a higher maturity level or add beneficial features.

The SBIR enhancement program will match an equivalent investment from a company of up to $500,000 for promising technologies. Historically, this match is activated toward the end of Phase II prototype development. SPARTN activates matching funds at the time of application for Phase II, which opens the door to getting more features or a more mature solution faster through an injection of more capital. About 30 percent of eligible SPARTN companies have exercised the option, pouring $1.5 million in private cash contributions into Army modernization in just three months—roughly 80 percent of Army SBIR's yearly average for companies' cash contributions.

While these capital incentives are attractive, companies will remain skeptical of SBIR opportunities if the Army cannot pay them on commercially acceptable timelines. For all SPARTN topics, review timelines were cut from an average of 78 days to 14.8 days. SPARTN also gets companies on contract quickly. The 224-day average from solicitation close to contract award for Army SBIR is 48 days on average for SPARTN. SPARTN puts money in the hands of companies two to three times faster by using deliverable-based, rather than time-based, contracts and making the initial deliverable due very early in the contract. SPARTN pays up to half the contract value in the second week, while SBIR pays one-sixth of the contract on rigid timelines. With SPARTN, small businesses don't pay out of pocket to work with the Army.

SPARTN topics offer only two paths for companies on contract: transition to follow-on contracts or early offramp of technologies without transition potential.

creativity to the problem, and were not given a thick requirements document for a predetermined solution.

Just 18 weeks and $3 million resulted in five concepts that graduated to Phase II—a clear improvement in cost and schedule. Of the five, four are complementary systems conceived by experts in the cutting-edge technologies on which they are built. Product Manager Self-Propelled Howitzer Systems has the option of modularity with the four, and can adjust their acquisition based on the maturity of the tech, funds available, or other considerations. This also mitigates the risk to the program, and to the Army, of buying one solution that ultimately proves unsatisfactory.

Among the Phase II concepts are solutions the CFT and the product manager never considered—another benefit derived from letting the innovators access the problem in depth. And every Phase I concept changed after the problem solvers went to the field to work firsthand in the Paladin with Soldiers and the product manager.

CONCLUSION

There are hundreds, maybe thousands, of companies with no history of working with the government that can help solve Army problems. The Army must make it worth their time and effort. SPARTN demonstrates that SBIR can be a viable entry point for small businesses and a powerful tool to fill critical modernization gaps while reducing costs and accelerating transition.

If Army modernization is to succeed, the service must standardize successful methods, its messaging about them, and metrics that prove return on investment rather than money spent. It must reinforce success and ensure that lessons are learned rather than missteps repeated. To do otherwise would be a broken promise to nontraditional DOD partners and would turn back hard-earned and badly needed progress. It will be harder to convince businesses again.

SPARTN problems are broad, presented in plain language, devoid of jargon and designed to allow commercial problem solvers to propose solutions the Army hasn't thought of yet.

For more information, go to ***https://armyfuturescommand.com/aal/****.*

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WHY DOES THIS HAVE TO BE SO COMPLICATED?

Lessons learned from an assistant product manager.

by Maj. Megan M. Evans

OBSOLESCENCE IN PRACTICE
It's an all-too-familiar scenario for many. When purchasing a new cellphone, you may find yourself also needing a new charger, new earbuds and a new case. The old ones still worked fine, but they are not compatible with the new phone. (Image by GettyImages)

"Why does this have to be so complicated?"

That is the question I asked during my first quarterly review, where we examined parts and materiel that were at risk of becoming obsolete. I was the assistant product manager for the Patriot Advanced Capability – Phase 3 Missile Segment Enhancement (PAC-3 MSE) Missile, the most recent variant in the Patriot family of air defense artillery missiles. That simple question led me into a review and subsequent analysis detailing obsolescence issues specific to the missile that turned out to be much more complex than anticipated. I started with questions, more questions, and then thankfully some answers that enabled discussions on where the MSE design should go to help manage the risk of obsolescence.

THE ISSUE

Obsolescence is both a challenge and an opportunity. When someone thinks of a part becoming obsolete, typically they think of older parts that become outmoded and replaced over time—like rotary phones, for example. For the Patriot missile, however, the meaning of "obsolete" is more complex than that. It's not just the part itself, but the part's impact on the larger system.

Take your cellphone, for example. After several years, the manufacturer will no longer support your phone with software updates. You purchase a new phone, but then realize it is not compatible with your old charger, your earbuds and other components. You only needed a new phone, but now you have to replace all of those subcomponents in order to keep the same functionality. You have just lived through obsolescence, and are probably a lot lighter in the wallet.

The same is true when a weapon system's part becomes obsolete after the system is already developed or produced. When parts for a subcomponent of a missile become obsolete, that drives redesigns. Still, opportunities emerge when program offices can balance and control obsolescence and its redesigns to strategically increase performance characteristics in a system and keep it competitive against emerging threats.

Multi-year contracts could help fund requirements in future production years to keep enough parts on hand.

SO MANY QUESTIONS

The author encourages other assistant product managers to ask as many questions as necessary while becoming familiar with their new roles. (Image by GettyImages)

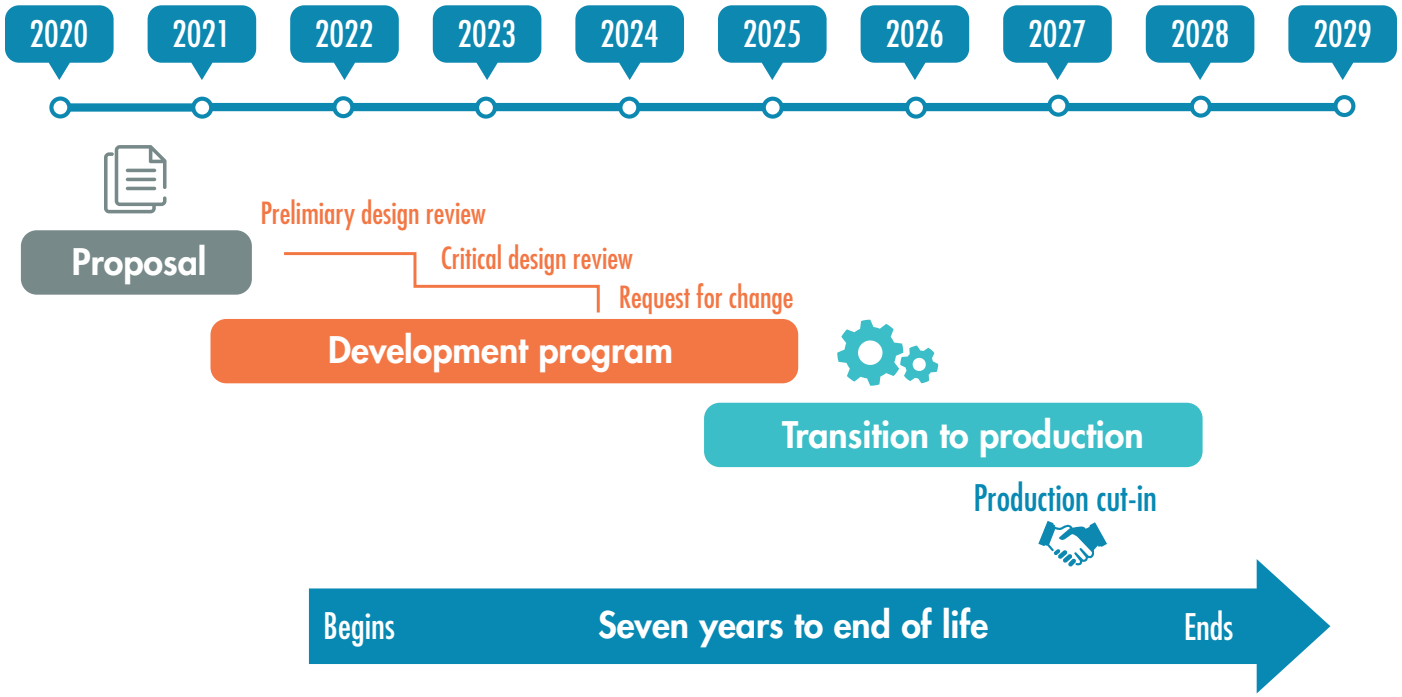
HOW COULD THIS EVEN HAPPEN?

When the PAC-3 MSE was first delivered in 2014, the contract called for 92 missiles per year. Demand increased steadily as international partners began procuring systems of their own through foreign military sales (FMS); most recently increasing to 500 per year for the 2022 fiscal year.

MSE major redesigns typically occur about every four years. These redesigns are planned to allow the technology to evolve over time, and they are useful to address technology that becomes obsolete. But redesigns are expensive. For the MSE, a large portion of the costs were shared with FMS partners through an international engineering service program contract.

This faster obsolescence phenomenon is caused, in large part, by the increase in annual production requirements to meet worldwide

FIGURE 1



OBSOLETE BY DESIGN

Design specifications are planned to maintain the same interface from the preliminary design review for a seven-year period, until the design becomes obsolete. (Graphic by the author)

demand versus planned production in the original obsolescence plans. That's because a prime contractor bought enough parts for the original contracted numbers, but when the requirement increased because of factors like FMS demand, the parts ran out faster than projected. When the contractor ordered new parts to increase production, some of the parts were no longer available, driving the need for a redesign. If the contractor did not complete a redesign to account for those unavailable parts, there would be gaps in production. Surprisingly, the U.S. government still has to pay personnel- or maintenance-associated costs for production lines, even if they go cold, as part of the contracts to maintain the lines' functionality while issues are resolved.

Commercial parts purchased for the MSE are a small portion of the overall commercial market share. Major components within these missiles actually use parts that are similar to those in cellphones—just made with military specifications. DOD is not a major buyer of the type of commercial parts and materiel that our prime contractor uses for designs, such as processors and memory (approximately 1 percent of commercial market share). The U.S. and its FMS partners buy parts and materiel for hundreds of missiles annually.

In contrast, commercial companies like cellphone makers purchase parts for millions of products per year. Cellphone companies are always adapting to the desires of consumers, and consequently, larger subcomponent providers adapt and evolve for large primes because of their share of the market. As a hypothetical example, a subcomponent provider might stop making certain parts, like a processor used by the U.S. government in a particular missile seeker, and shift its efforts to meet other lucrative market demands, like a more advanced processor for my phone so I can stream videos of fainting goats.

WHY DON'T WE JUST BUY MORE PARTS?

One way to mitigate this kind of situation is for the U.S. government and prime contractors to execute a lifetime buy of the discontinued part. A lifetime buy is based on an estimate of the

number of parts that would be needed, due to contractual requirements and expected number of missiles.

Changing demands heavily affect the long-term viability of those lifetime buys, however. As the MSE demand increased per year, the lifetime buy run-out point came earlier than originally estimated. These changes accelerate the need to redesign sooner than originally planned.

In most instances, contractors will not buy components ahead of need for production until the development and qualification programs are complete. Business strategies motivate contractors to look at the tradeoff between ordering parts too early, the expense of building adequate facilities for storage, and the risk of excess inventory, versus not ordering parts soon enough, which impacts production schedules. By law, the government cannot buy parts ahead of need, and must procure parts for requirements each year within the president's budget. So, even in face of obsolescence, a possible redesign, and knowing that buying more parts now will mitigate risk to the production line by "buying in bulk" with a lifetime buy, you do not have the authority by law, nor the money to do it. Interesting, right?

In MSE, design specifications are planned to maintain the same interface from the preliminary design review through seven years, until the design becomes obsolete. (See Figure 1.) This seven-year figure is based on the term YTEOL, or "years to end of life." The preliminary design review usually happens six to 18 months into development, and is followed by a critical design review, and then a request for change. Once the design reaches production, there is only a small window of time remaining before the design becomes obsolete. Another surprise to this young assistant product manager!

HOW CAN WE FIX THIS?

The PAC-3 MSE product office implemented a long-range, strategic planning cell that built a product road map to show where the missile technology needs to be inserted to support the requirements. The product road map helps strategize and control timing of redesigns, while taking the opportunity to add performance improvements. The planning cell facilitates crucial conversations with contractors, causing them to think differently about which part manufacturers they use for designs.

Obsolescence is both a challenge and an opportunity.

The contractor builds a design and chooses parts based on a list of weighted criteria, including required speeds, weight, distance, targets to engage, and somewhere down on the list, risk of obsolescence.

For example, remember that commercial processor that allows me to watch fainting goats on my cellphone? It could also be chosen for the contractor's design because it gives the missile seeker required performance. However, that processor may have a high risk of obsolescence, which would push it further down on our weighted selection scale. We also evaluate providers in other industries, such as the auto industry. Analysis must be conducted to see if these parts could be used and have more longevity, providing greater production stability. As DOD continues its modernization efforts, and pivots toward using artificial intelligence in operations, understanding how these single-source unique parts affect the longevity of a weapon's design and production will be crucial. Therefore, the government and the contractor need to have that crucial conversation prior to and at preliminary design review about which part is in the final design. If not, it could have a waterfall effect when that advanced processor needs to be replaced sooner than planned and forces the system to be modified.

As described earlier, business strategies drive contractors' decisions to invest in parts ahead of need. However, those factors do not drive the government. Laws governing acquisitions limit the government's ability to commit funds ahead of need, but there are tools that can help and acquisition strategies it can employ to reduce risk.

Multi-year contracts could help fund requirements in future production years to keep enough parts on hand to mitigate production obsolescence risks. According to the Navy Multi-Year Procurement Guidebook, the U.S. Navy has used these types of contracts to lower costs, provide substantial continuity of production or performance of its procurements, and provide incentives to contractors to improve productivity through investment in capital facilities. Another innovative idea is to rethink how the U.S. and its FMS partners quantify the amount of parts purchased during the development contract and transition to production. Additional parts purchased at that time could be a risk mitigation tool to protect against more parts being used than originally projected.

THE WAY AHEAD

Obsolescence is complex, and using lessons learned from other programs is a good place to start when going into any new development program.

EYES ON THE PRIZE
As a new assistant product manager, the author discovered how little she knew about obsolescence, among other complex ideas in acquisition. To make judicious use of taxpayer dollars, she said it is imperative to wade through the issues and associated mitigation techniques. (Image by GettyImages)

For the Patriot missile, the meaning of "obsolete" is more complex. It's not just the part itself, but the part's impact on the larger system.

Building out a product road map to see where the design will go over the years to meet objective requirements helps manage the risk of obsolescence. As the U.S. implements its road maps during design or redesign, risk of obsolescence should not be an undervalued criterion. Finding new suppliers for sole-source unique parts (specialized ones that are not easily replaced) is another way to manage obsolescence risk. Using "new" contracting methods like multi-year contracts, even if they are not typical to your product office or system, is another way to support a more strategic approach to managing production.

The warfighter and FMS partners count on stable production for protection against current and emerging threats around the world as they execute multidomain operations. Equally important, acquisition professionals have a responsibility to U.S. taxpayers to ensure we optimize our investments of their resources. DOD is operating in a resource-constrained environment, so finding innovative ways to save funding over time is crucial.

I implore assistant product managers, especially other "newbies," to keep asking questions, no matter how simple or silly you think you may sound. Like the great philosopher Socrates, your curiosity and probing questions may break through some of the complexities and find solutions. You must become well-versed in your programs and use critical thinking to enable the learning process.

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ACQUISITION ON THE MIND

Behavioral acquisition studies the way acquisition decisions are made. Human personalities, tendencies and biases affect our decisions, even when we think we are making choices based strictly on data. (Graphic by Getty Images)

BEEN THERE,
DONE THAT

BEHAVIORAL ACQUISITION

The part of acquisition sciences that has the biggest impact on acquisition program success rarely gets studied or even acknowledged.

by Dr. Robert F. Mortlock, Col., USA (Ret.)

In the field of personal finance, understanding human behavior has long been recognized as critical to individuals achieving financial independence and security. Most financial planning experts agree that if you have the time, desire and knowledge (expertise and experience), then hiring a financial planning professional may not be necessary. However, even if you do have the time, desire and requisite knowledge, there still may be value in hiring a professional because of their independence and impartiality. In other words, the professional "protects us from ourselves."

In personal finance, countless studies have shown that individuals tend to make financial decisions that are emotionally driven and not in their own best interests, rather than objectively driven and based on data and analysis. This study of how people make personal financial decisions is often referred to as behavioral finance, an area where financial planning professionals bring real, measurable value to their clients. They keep their clients from making financial decisions based on emotions or biases.

SO HOW IS THIS RELATED TO DEFENSE ACQUISITION?

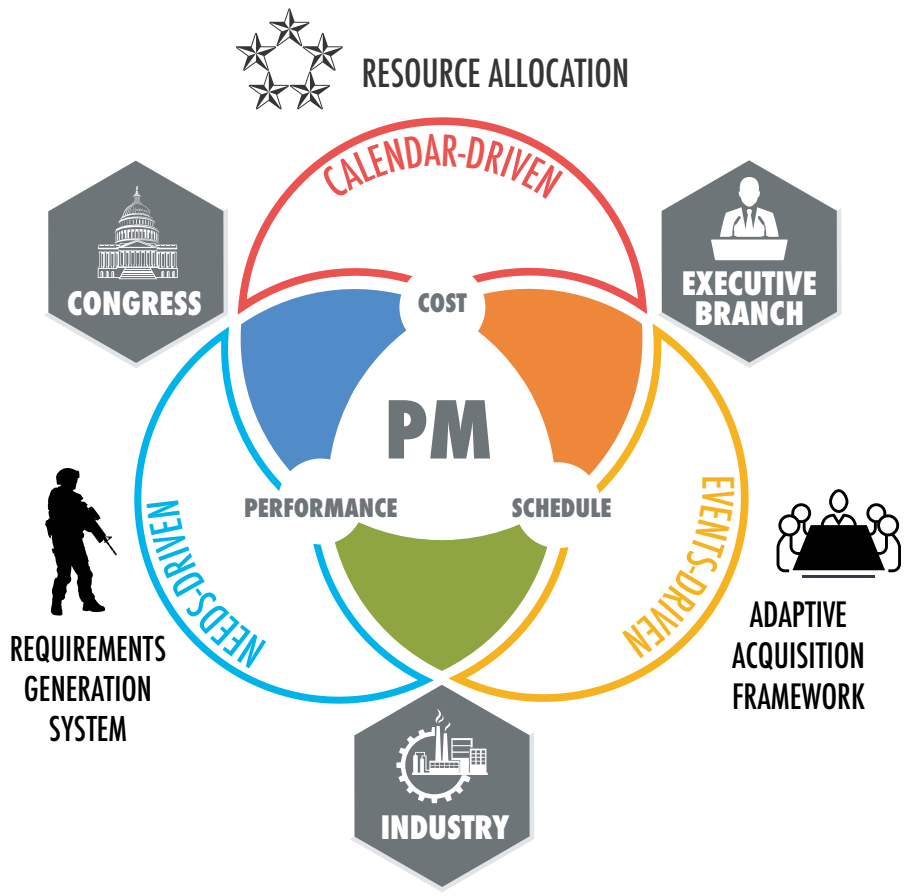
Acquisition professionals provide this type of value to senior defense leaders for acquisition programs. Understanding and studying the human part of the acquisition sciences may be the single most critical aspect to achieving better success and effectiveness in defense acquisition. Senior acquisition leaders across DOD often proclaim that the defense acquisition system's most important asset is its people—the professionals in the acquisition workforce.

However, investments in the education and training of these professionals often take a backseat to other higher priorities during annual funding drills in the planning, programing and budgeting process. It is simply hard to justify an investment in education over funding an acquisition program that provides tangible products and services for warfighters—even though the return on investment in our *people* may be orders of magnitude better than the return on investment of an acquisition program of record, prototyping effort or experiment.

Acquisition professionals are the most important asset in the defense acquisition system. They protect the interests of the warfighter and increase combat effectiveness by leading acquisition efforts and making make wise decisions.

Acquisition professionals also "protect senior leaders from themselves" with independent, objective, fact-based, data-driven analysis and recommendations. To do this well, acquisition professionals need education and training in all the fields of acquisition sciences (program management, contracting, engineering, test and evaluation, life cycle logistics, financial management and cost estimating) along with a deep understanding of human behavior and organizational dynamics. Specifically, I have coined the phrase *behavioral acquisition*, which explores defense acquisition from a behavioral standpoint, including the impact of psychology, organizational behavior and politics. Behavioral acquisition studies the decisions made in DOD acquisition programs and helps better understand and predict how acquisition professionals and senior leaders think and make decisions about program strategy, managing resources and leading people. Behavioral acquisition is analogous to behavioral finance, which has successfully applied social science theories—especially from psychology—to improve the accuracy of predictions about personal financial decisions.

FIGURE 1



THE BIG "A" AND THE PEOPLE

U.S. defense acquisition can be viewed through the framework of a combination of the PM triple constraint, chain of authority, acquisition environment and decision-support templates. This perspective of big "A" acquisition highlights acquisition professionals—the people who affect this system that supports delivering warfighting capabilities. (Graphic courtesy of the author)

DECISION-MAKING IN DEFENSE ACQUISITION

Given the complexity of the U.S. defense acquisition portfolio, better understanding how acquisition professionals, specifically program managers (PMs), make decisions would prove valuable for improving defense acquisition outcomes.

The PM is at the center of defense acquisition and is responsible the triple constraint of cost, schedule and performance for assigned projects. The PM has a hierarchical chain of command (or authority) through DOD in the executive branch. PMs report directly to a program executive officer, who reports to the Army, Navy

or Air Force acquisition executive, who reports to the undersecretary of defense for acquisition and sustainment as the defense acquisition executive. Depending on the program's visibility, importance and funding levels, a program's milestone decision authority is assigned to the appropriate level of the chain of command.

As a backdrop to this complex acquisition environment for PMs, three decision-support systems guide programs:

- The generation of requirements.
- The management of program milestones and knowledge points, known as the Adaptive Acquisition Framework (often referred to as "little 'a' acquisition").
- The allocation of resources.

Each of these decision-support systems is fundamentally driven by different and often contradictory factors. The requirements-generation system is capability needs-driven based on an evolving threat—requiring a responsive acquisition system. The resource-allocation system is calendar-driven, with Congress writing an appropriations bill and the president signing the bill every fiscal year—providing control of funding to Congress and transparency to the public and media for taxpayer money.

The Adaptive Acquisition Framework is event-driven by milestones—based on commercial industry best practices of knowledge points and offramps supported by the design, development and testing of the systems as technology matures and integration and manufacturing challenges occur. The combination of the PM triple constraint, chain of authority, acquisition environment and decision-support templates provides a framework to view U.S. defense acquisition, referred to as the defense acquisition institution (or "big 'A' acquisition"), depicted in Figure 1.

Because of the inherent challenges involved with the development, procurement and fielding of sophisticated weapon systems that are required to operate reliably in challenging military environments, acquisition programs sometimes fail to deliver required performance capabilities within cost and schedule constraints. Root causes of acquisition program failures (schedule slips, cost overruns or capability underachievement) can be generally grouped into the following: ill-defined requirements, immature technology, integration challenges, poor cost estimating, unstable budgets, poor schedule planning and schedule pressure from annual appropriation limitations. But an underappreciated reason for acquisition program failures and an understudied part of big "A" acquisition is the "people part," which may have the largest effect on improving acquisition outcomes. Behavioral acquisition includes a study of organizations and hierarchies and the intersection of individual behavior, leadership, culture and decision-making.

Decisions at the institutional (DOD) level are often made using a political conceptual model where decisions are a result of bargaining games and politics. And decisions at the organizational (service or PEO) level are often based on the appropriateness of the actions fitting the organization's cultural norms. Whereas at the individual (program) level, decisions mostly leverage a rational conceptual model in which decisions are based on logic and reasoning by assigning pros and cons and deciding the best chance of success. Important differences exist in how biases can affect leader decision-making in programs, organizations and institutions within DOD. Figure 2 presents an overall model showing the connection of hierarchical, leadership, cultural and behavior factors on management, decision-making and program outcomes.

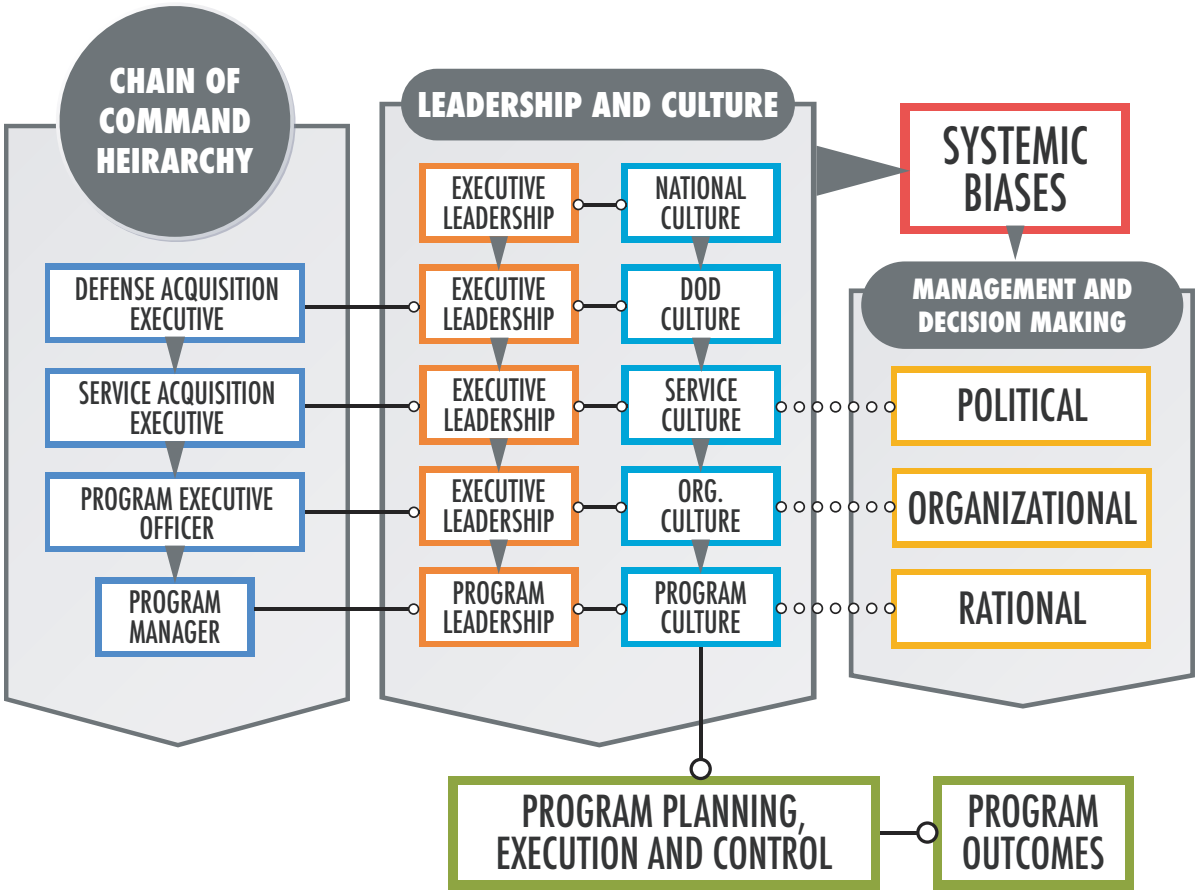
Understanding and studying the human part of the acquisition sciences may be the single most critical aspect to achieving better success and effectiveness in defense acquisition.

BEHAVIORAL BIASES

Central to understanding decision processes in the defense acquisition environment is recognizing the impact that biases have on decision-making. These biases can be categorized into cognitive and emotional biases, but their common root is the ways in which human brains process information. There is a lack of research studying the effects of behavioral biases on decision-making in the defense acquisition environment. In general, acquisition programs are wide open to biases creeping into the program decision-making processes. Empirical case studies illustrate that acquisition programs are environments where there is abundant opportunity for behavioral biases to play a significant role in decision-making.

The following is a list of common behavioral biases often observed within defense acquisition programs that have affected decision-making and therefore program outcomes:

FIGURE 2



THE CONNECTION

Here is an overall model of big "A" acquisition, illustrating the connection of hierarchical, leadership, cultural and behavioral factors on program outcomes, management and decision-making. (Graphic courtesy of the author)

- Planning fallacy—"This time it's different."
- Difficulty making tradeoffs—"Everything is important, therefore nothing is."
- Over-optimism—"Yes, we can do it," or seeing things through "rose-colored glasses."
- Recency bias—"Little chance of success unless this new initiative is incorporated."
- Narrow or myopic framing of issues.
- Loss aversion when ahead and risk favoring when behind.
- Status quo bias or anchoring effect.
- Confirmation bias.
- Attribution bias—"Externalize failures or internalize successes."
- Illusion of control.
- Availability heuristic—"In my last program …," "Other programs right now … ."
- Narrative fallacy preference for stories over data.
- Framing effects—We are influenced by the way information is presented.
- Regret aversion.
- House money effects—Make us more risk-seeking.
- Hindsight bias.
- Blind spot bias—We think we are less prone to cognitive bias than those around us.

Recent acquisition reform directives and statutes require data-driven analysis and decisions, which put an emphasis on rational optimization. But whatever analysis tools are the fad or fashion of the day, decision-making inevitably still consists of people operating inside a program or organization trying to make decisions that deliver required outcomes. Hence, despite calls for

The return on investment in our people may be orders of magnitude better than the return on investment of an acquisition program of record, prototyping effort or experiment.

more rationality, the organizational and political dimensions of decision-making matter, and these dimensions interact with behavioral biases in particular ways.

Research centering on the acknowledgment and study of bounded rationality has long recognized that people process information in ways that may lead them to make biased judgments. Cognitive biases are a two-edged sword: On the one hand they have a positive function in helping people to make fast decisions using limited cognitive resources. On the other, cognitive biases also lead people to make errors in decision-making that deviate—often in important ways—from rational decision-making.

Nonetheless, a basic premise of research into biases is that, as the volume and complexity of information increases, we are forced into using simplifying tactics that ration the limited cognitive resources we have available. Hence, we adopt heuristics that ease the cognitive strain. And because these heuristics involve rationing how information is processed, we develop systematic patterns of bias in decision-making.

CONCLUSION

That we see the effects of behavioral biases within the management and decision-making of acquisition programs comes as no surprise. For the past three decades, acquisition management has been highlighted on the Government Accountability Office's high-risk list for excessive waste and mismanagement. Notable programs have failed to deliver capability and have failed to meet performance, cost and schedule management targets. The root causes of program failure vary from ill-defined requirements, immature technologies, integration challenges and poor cost estimating, to the acceptance of too much development risk.

Underappreciated and understudied is the effect that systemic biases have on acquisition professionals and, more importantly, on acquisition program milestone decision authority, which contributes to the root causes of acquisition program failures. The better we understand the effect of these systemic behavioral biases, the better we can mitigate the risks of program failures resulting from poor or suboptimal decision-making.

The culture and leadership at different levels of DOD, from the institutional level to the organizational level to the program level, affect the impact of the biases. In DOD's hierarchical chain of command, the PMs are responsible for the program's cost, schedule and performance. However, the PMs do not establish the performance requirements, cost or schedule objectives of the acquisition program baseline—the services do. Additionally, PMs report to a milestone decision authority, who approves the program and determines overall program strategic direction. The systemic biases at the various levels of the chain of command manifest differently in the decision-making models used at different levels. Behavioral acquisition studies how culture, leadership, hierarchies and decision-making models moderate the effect of systemic behavioral biases with the goal of improving the management and execution of programs—ultimately improving program outcomes and satisfying warfighter requirements for better capabilities.

Future articles in the "Been There, Done That" series will take a case study-based approach and highlight how behavioral biases affect decision-making within acquisition efforts and contribute to acquisition program failures.

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LET ME REPEAT
Current AI agents consume each request independently of the user's history—it's like having a conversation with a goldfish. (Image by Getty Images)

LOUD AND CLEAR

Tactical speech recognition presents a variety of challenges that the Army is looking to overcome.

by Thom Hawkins and Dr. Reginald Hobbs

This is a nightmare scenario for our Soldiers, but also sounds like a plausible dialogue given our collective experience with commercial virtual assistants like Amazon's Alexa.

"Agent, provide data about that base."

"I found 'All About that Bass' by Meghan Trainor. Do you want me to play it?"

"Agent, no! Data about that *base*!"

Because you know I'm all about that bass, 'bout that bass. No treble …

There's a reason that we put up with the flaws—because we've been raised with high expectations for this type of interface. Voice interaction with artificial intelligence has a long history in Hollywood—from Robby the Robot of "Forbidden Planet" (1956) and HAL 9000 from "2001: A Space Odyssey" (1968) through Tony Stark's JARVIS in "Iron Man" (2008) and Ava from "Ex Machina" (2014)—because the technology enables human-like interaction to further the film's narrative without boring anyone with typing. Because of this familiarity bred through popular science fiction, we *expect* these voice interfaces to work, regardless of the environment and context.

Apple's Siri, one of the first widely available virtual assistants, was introduced on the iPhone 4S in 2011. Many of our Soldiers have never owned a mobile phone that did not include such an agent. One of the biggest challenges we have to technology adoption is managing the expectations of users who are exposed not only to military technology, but also commercial. A user might be frustrated when an action on a hand-held device takes several more steps than it would on their own mobile phone.

The use cases for automatic speech recognition in a tactical environment include voice control, conversational artificial intelligence (AI) agents and content analysis of voice communication, all of which have roots in available commercial technology. Though voice recognition and speech recognition are sometimes used synonymously, there is an important distinction between the two—voice recognition identifies people by the sound of their voices, while speech recognition identifies people by the content (i.e., words) of their speech.

PERFECTING VOICE COMMAND

Automatic speech recognition has several advantages in a tactical environment. It enables us to multitask with a "heads-up, hands-free" approach. Natural language speaking is also the most effective way humans have to share information quickly. We want to be able to work with our

WHAT DID YOU SAY?
Noise levels differentiate the results of battlefield technology from commercial equivalents. Better microphones, custom noise filters, denoisification algorithms and automatic speech recognition models trained on noisy data may help improve results of voice control in the field. (Photo by 1st Lt. Angelo Mejia, 3rd Infantry Brigade Combat Team, 25th Infantry Division)

devices the way we work with each other. Finally, there's minimal learning curve for speech interfaces.

Voice control employs a transactional form of communication—a default behavior in response to a specified command. For example, "turn left," or "begin recording." Because there is a limited number of commands and they follow a particular syntactical pattern, often following a specific wake phrase (e.g., "Alexa" or "Hey, Google"), this level of interaction is not technically difficult to achieve. However, there is a spectrum of capability, from this type of basic automation on one end to conversational AI on the other end.

Leveraging work from the University of Southern California's Institute for Creative Technologies—a university-affiliated research center established by the Army—the U.S. Army Combat Capabilities Development Command's Army Research Laboratory developed the Joint Understanding and Dialogue Interface (JUDI) capability. With JUDI, Soldiers won't have to learn the language of a remote unmanned vehicle—they could say something like "move forward" or "get closer," where the context is implied. Rather than identifying requests as invalid (e.g., "I'm sorry, my responses are limited."), JUDI can enable an autonomous system to seek clarification, including when changes in the environment may have impacted the original request.

Two features set apart a conversational AI system from mere voice control. The first is the ability to take turns speaking and listening and the second is memory. If a user asks a commercial virtual assistant for a restaurant's hours, and then for its location, the restaurant must be specified in both requests, even if one is made just after the other. Each request is consumed independently of the user's history—it's like having a conversation with a goldfish. In our conversations with our fellow humans, we leave a lot out because we assume a common frame of reference built on shared experience.

Memory is context of the past, but other forms of context are also useful, such as time and space, the task being performed, roles and the environment. For example, spatial context is important to an autonomous system to know where it can't go (up

a cliff) or shouldn't go (off a cliff) and requires a specific sensor array to implement. A system should also understand a user's specific preferences, style of speech, language and accent. The ability to recognize and adapt to a user, though more complex, means less training is required on the user's part to adapt to the agent.

The third use case for automatic speech recognition, context analysis of voice communications, can be used for intelligence gathering, but also for maintaining situational awareness for our own forces—for example, detecting when Soldiers talking over the radio mention an enemy tank or incoming fire. Speaker detection is an important automatic speech recognition technique to build situational understanding—for example, being able to distinguish between participants in a conversation, a feature, called "speaker diarisation," informs inferences about the relationship between the participants (i.e., different ranks and roles) and how that bears on the content of the discussion. For radio communications, speaker detection is also key to threading together conversations that may be coming through an operations center as a series of separate voice data packets.

The Army Rapid Capabilities and Critical Technologies Office (RCCTO) sponsors the Virtual Assistant for Mission Operations (VAMO) project. Working with the Massachusetts Institute of Technology Lincoln Labs, a federally funded research and development center, VAMO is exploring the use of text and speech interfaces to provide transcripts, autofill forms and summarize content. The VAMO team recently participated in a technical exchange with the Navy, which is working on a similar project, the Ambient Intelligence Speech Interface (AISI).

HEARING THROUGH THE NOISE

While we're already starting to deploy automatic speech recognition-enabled systems, research challenges are still being addressed by our science and technology community to expand capabilities and improve outcomes. One of the most needed resources in this development is not expensive—it's data. Machine learning approaches are promising, but require large quantities of data. Talk via radio, in command posts and in moving vehicles—both during routine operations and during engagements—are necessary to ensure that the models are both sensitive to changes like noise levels or phase shifts, and also robust enough to handle natural variety.

Noise is one of the main factors that differentiates the results of battlefield tech from its commercial equivalents. It's also not likely that a single solution will fix this problem. Better microphones may help, as will custom noise filters, denoisification

NOW WE'RE TALKING

Much work has been done in the field of natural language processing, but it's important to note that written communication can be very different from spoken communication. Spoken communication is often less formal, because it can afford to be so. Take, for example, the following dialogue, which could take place between two humans or between a human and a robot interface.

Initiator: "Get that thing over there."

Respondent: "Where?"

Initiator: (Points at object.)

Respondent: "The blue one?"

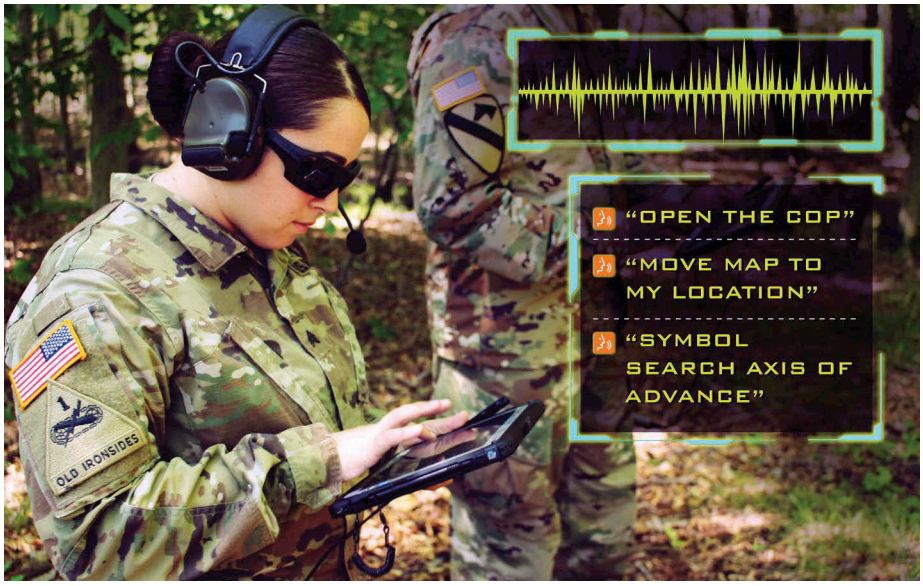
Initiator: "Yes, the blue one."

There are a few things happening in this dialogue. The initial command, "get that thing over there," is ambiguous. Neither what the thing is nor where are precisely defined. The following lines go back and forth rapidly to clarify the request. The initiator indicates a location by pointing and the other party identifies the object of interest by asking if it's the blue one.

One thing that speech allows for is a quick exchange. Had the original request been in writing, the initiator would have been aware that the request was vague without sufficient context and might have written something like "retrieve the blue box from the northeast corner." Otherwise, the back-and-forth of the written messages would have taken too long. There's also a question of economy of effort—a speaker wants to use as few words as possible, while the listener needs the words to be precise. Often, a speaker can also rely on additional channels of communication to augment the content—for example, intonation, pauses, volume, expression or gestures.

The medium of our communication affects the content. It's a form of code-switching, where a speaker changes how they speak based on the audience. We could teach our Soldiers to speak in a manner that is more readily parsed by a computer agent, effectively forcing them to code switch, depending on whether they're talking to man or machine. But let's face it—if they take our language, the robots have already won.

EASE OF USE
With JUDI, Soldiers will be able to say simple commands like "move forward" where the context is implied, and the system can seek clarification. (Image by U.S. Army)



BE SPECIFIC
Currently, Soldiers have to understand system-specific commands to communicate with AI agents that if not spoken correctly can result in confusion or misinterpretation on the part of the agent. (Image by U.S. Army)

algorithms and automatic speech recognition models trained on noisy data. Not all noise is bad, either—markers such as disfluency (e.g., um, uh), pauses and stutters themselves provide information that is useful to understand the message, identify the speaker and even provide information about that speaker's state of mind.

We must also be attuned not only to the benefits of automatic speech recognition, but also to the potential impact on Soldier performance. There's almost always a story in the news about privacy fears and so-called "always listening devices." Whether we're talking about tapping into text chat or radio chatter, this is undoubtedly more intrusive than Google mining email keywords for ads because the output has a wider audience than the user. Because of this, deploying automatic speech recognition has the potential to change how our Soldiers communicate, or which media they use, even if we don't specifically teach them how to talk like a computer.

Studies have shown that drivers engaged in conversation have a significantly slower response time than those who are not—and further studies have shown response time is even worse when the conversation partner is not a passenger, who might mitigate the response through their own awareness, but someone on the other end of a phone call. This certainly has implications for attention and focus on tasks; for example, when a Soldier is performing a demanding task like operating a vehicle and that Soldier must also speak an unrelated command at the same time, like reporting an observation of an enemy plane.

CONCLUSION

Over the past 50 years, there have been several "AI winters" when disappointment about the outcomes of AI investments led

SAY IT AGAIN
The best, most effective way of communicating is through natural language speaking—getting AI agents to recognize natural language is key in future developments. (Image by Getty Images)

to periods of reduced interest and funding. Automatic speech recognition is not immune to this fate. As the acquisition community, we want to provide the best tools available. At the same time, if we field automatic speech recognition that performs below commercial expectations, trust becomes a factor in whether or not those tools are used. While the commercial world will no doubt continue development of this technology as long as there's money in it, only some features of a tactical application are considered dual-use. Speaker detection, for example, has a use when more than one person shares a virtual assistant, but mitigating a tactical noise profile is less applicable to commercial devices. While several organizations, including the Joint Artificial Intelligence Center and the RCCTO, have started testing various open-source automatic speech recognition models for particular tasks, the initial results have shown room for improvement with a tactical noise profile. Training automatic speech recognition for high and variable noise levels is not something industry will prioritize for dual-use technology.

The stakes for technology reliability are higher in a tactical situation, where a mistake could result in the loss of a life rather than the wrong song being played. When we have a fight on our hands, it should be with the enemy, not with our technology, and we shouldn't have to raise our voices just to be heard.

For more information, contact Thom Hawkins at ***jeffrey.t.hawkins10.civ@mail.mil.*** *For more information about RCCTO and VAMO, contact Sean Dempsey at* ***sean.e.dempsey.ctr@mail.mil*** *and for more on JUDI, contact Matt Marge at* ***matthew.r.marge.civ@mail.mil****.*

THOM HAWKINS is a project officer for artificial intelligence and data strategy with Project Manager Mission Command, assigned to the Program Executive Office for Command, Control and Communications – Tactical, Aberdeen Proving Ground, Maryland. He holds an M.S. in library and information science from Drexel University and a B.A. in English from Washington College. He is Level III certified in program management and Level II certified in financial management, and is a member of the Army Acquisition Corps. He is an Army-certified Lean Six Sigma master black belt and holds Project Management Professional and Risk Management Professional credentials from the Project Management Institute.

DR. REGINALD HOBBS is chief of the Content Understanding Branch at the U.S. Army Combat Capabilities Development Command Army Research Laboratory. He earned a Ph.D. and an M.S., both in computer science, from the Georgia Institute of Technology and a B.S. in electronics from Chapman University. He has research interests and experience in the areas of software engineering, network science, natural language processing, artificial intelligence and cognitive science. He serves as an adjunct professor on the faculties of Howard University and the University of the District of Columbia.

A PROFESSION AND A PRACTICE

Acquisition education and training can transform your life. I know. It did mine.

I am ecstatic to be joining the team as the new Director of Acquisition Career Management (DACM). It is my honor, and a high point of my career, to serve in a capacity that allows me to support people, especially those who choose to support the critical mission we have in the Army—to deploy, fight and win the nation's wars.

I served in uniform for 10 years before transitioning to a civilian position and then to industry. I remained in the Army Reserves for another 15 years as an individual mobilization augmentee and a U.S. Military Academy at West Point "Field Force" admissions officer. It felt good to put on the uniform, even if only for a few days each month. I spent five years working in industry. And then on Sept. 11, 2001, I refocused my priorities and returned to government service.

I am an acquisition professional.

I've had the incredible opportunity to work for a large number of organizations and programs. My time with the Defense Health Agency was particularly meaningful. As the deputy program manager for the DOD Health Management System Modernization Program, I was able to see firsthand the personal aspect of what we were doing, especially in support of our veterans—seamlessly integrating records with the U.S. Department of Veterans Affairs and providing a comprehensive longitudinal record for every Soldier, Sailor, Airman and Marine, including our wounded warriors—supporting them from accession through transition.

I spent the past five years of my career, before becoming DACM and the director of the U.S. Army Acquisition Support Center, at the Program Executive Office (PEO) for Soldier, where I led acquisition streamlining and acquisition operations in support of the PEO. Throughout my career I have had the privilege to learn about and see the impacts of my work firsthand, but it was in that job at PEO Soldier where I was brought closest to that reality.

ROLL CALL
Retired Adm. Mike Mullen, left, then chairman of the Joint Chiefs of Staff, congratulates the author at the National Defense University commencement exercise in June 2010. (Photo courtesy of the author)

AN ACQUISITION TRADITION
The author and his wife, Nancy, attend the PEO for Enterprise Information Systems (EIS) All Saints Ball in October 2018. (Photo by Cecilia Tueros, PEO EIS)

On Sept. 3, 2018, Staff Sgt. Steven McQueen of the 1st Security Force Assistance Brigade, while on deployment in Afghanistan, was struck in the back of the helmet with a 7.62x54 mm Russian round. He survived with minor injuries.

On March 3, 2019, the damaged Enhanced Combat Helmet that McQueen was wearing that day in Afghanistan was returned to him at PEO Soldier as part of a personal protective equipment return ceremony. I was in attendance that day. I was able to see the direct impact that our team of acquisition professionals had on saving this Soldier's life. I can't think of any other career where one can have such an impact.

I'm also an acquisition practitioner.

My career has been all program management—managing programs in uniform, out of uniform and in industry. I hope to bring that broad perspective to this job. I attended the Industrial College of the Armed Forces (now called the Dwight D. Eisenhower School for National Security and Resource Strategy); I participated in the Senior Enterprise Talent Management program, and was a Senior Acquisition Course student. Those developmental and broadening experiences helped me make connections and exposed me to diverse perspectives beyond my existing world view. I believe that the programs offered through the DACM Office are an investment in our Army acquisition professionals; an investment that teaches discipline and coping skills, encourages diversity in thought, and results in better outcomes.

My experience attending the Industrial College of the Armed Forces was transformational. I attended classes and had

Whether it's Soldier gear, tanks, helicopters, medical equipment or new hypersonic or directed-energy weapons, it's our workforce that makes it happen.

I have had the privilege to learn about and see the impacts of my work firsthand.

IN THE FIELD
The author in August 2004, when he was project director for Integrated Clinical Systems, at a demonstration of the Deployable Teleradiology System. (Photo courtesy of the author)

discussions with professionals from our sister services, the Office of the Secretary of Defense and industry, as well as with foreign officers. These broad and diverse interactions completely opened my mind. I am grateful to the leaders I had at the time for encouraging me to briefly step aside from my job so that I could learn from others and evolve as an acquisition professional and leader. We need to continue to prioritize investments in our workforce such as these.

Talent management is key to success.

I've always been laser-focused on getting kit into the hands of Soldiers. Whether it's Soldier gear, tanks, helicopters, medical equipment or new hypersonic or directed-energy weapons, it's our workforce that makes it happen. We need experienced leaders who are well-trained and in tune with current trends and best business practices. We need to be early adopters of new acquisition authorities and leverage every tool at our disposal to accelerate delivery of capability to the force. We need agile and adaptive professionals with solid acquisition acumen and well-developed critical thinking skills so we can pivot as conditions change.

We're seeing some major shifts now as we transition the force with Back-to-Basics. We're going to see changes to career fields, streamlining them to six functional areas that represent the basics of acquisition. We're going to see changes in institutional training, shifting to a leaner, "just-in-time" certification structure that is intended to cover core competencies within each respective functional area, and an enhanced focus on the experiential component.

We're updating our centralized selection list process and incorporating the Acquisition Leader Assessment Program (ALAP), which adds complexity for those leaders looking to take on challenging assignments. Through the ALAP, we'll be able to further assess officers' and civilians' readiness to lead. Changes like these make our workforce more effective and efficient, and help to ensure we are setting up future Soldiers for success.

Throughout much of my career I have been on the receiving end of the information and opportunities that come out of the DACM Office. I give much credit to Craig Spisak and the DACM team for preparing me to assume the responsibilities of this position today, and I appreciate the support provided to the Army acquisition community. I am excited to wind up my career in the most important job I will ever have—taking care of our people.

Looking back on that personal protective equipment return ceremony at PEO Soldier, McQueen was joined by his family—his wife and three children, the youngest of which, at 10 months old, McQueen might never have met if not for that helmet. That is my reason and my reward for choosing the Army Acquisition Workforce. I look forward to helping you find your reward, too.

LOSE THE PAPER

For Army Human Resources, the future is here.

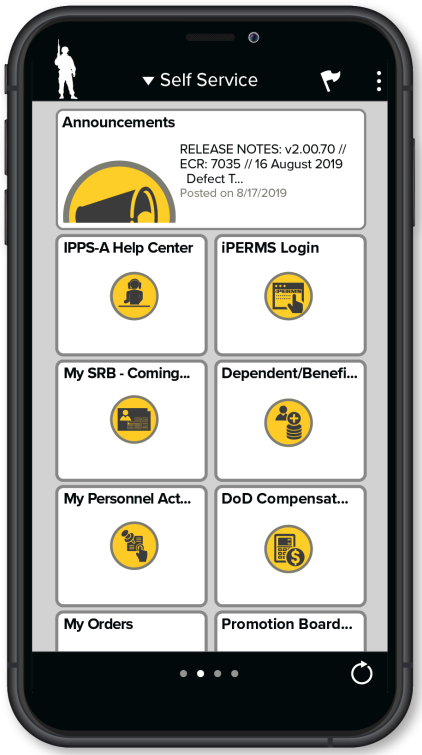
by Col. Rebecca Eggers

The Army strives for a future where Soldiers no longer will waste their valuable time filling out paper forms or trying to figure out the status of their personnel actions. Soldiers no longer will wait in human resources (HR) offices experiencing delays because of legacy system outages or inefficient analog processes. A future where the latest technology ensures personnel actions automatically trigger pay actions, reducing pay errors to ensure timely, accurate pay and minimizing financial hardships for Soldiers.

This December, the entire military force will transition to a 21st century HR system called the Integrated Personnel and Pay System – Army (IPPS-A). IPPS-A will combine personnel, pay and talent management capabilities for all three components—active, Reserve and National Guard—into a single web-based system. This is the Army's No. 1 HR modernization effort and part of the broader Army People Strategy, which seeks to shift from "distributing personnel" to a system that recognizes the talents and skills possessed by Soldiers and allows the Army to employ each to maximum effect.

Initial operating capabilities are being deployed in incremental releases. This step-by-step approach builds upon capabilities and incorporates user feedback to deliver a better product to Soldiers. In addition, it helps users become familiar with the system before full deployment, as well as enabling the Army to better accommodate required system testing and training. Deployment of releases began in 2015 with Release 1, which built a foundational database of trusted personnel data for future releases.

Release 2 fielding was completed with the Army National Guard in March 2020. The release subsumed two legacy systems and integrated the pay systems of 50 states and four territories to streamline processes and reduce pay errors for Soldiers. For the first time, all 350,000-plus Army National Guard Soldiers are performing electronic self-service personnel action requests, such as changes to marital status, name and beneficiaries. Release 2 also includes 26 military pay actions in areas such as



THERE'S AN APP FOR THAT
The Army's new IPPS-A app will allow Soldiers to access and update their own personnel records from anywhere, at any time. (Image courtesy of IPPS-A)

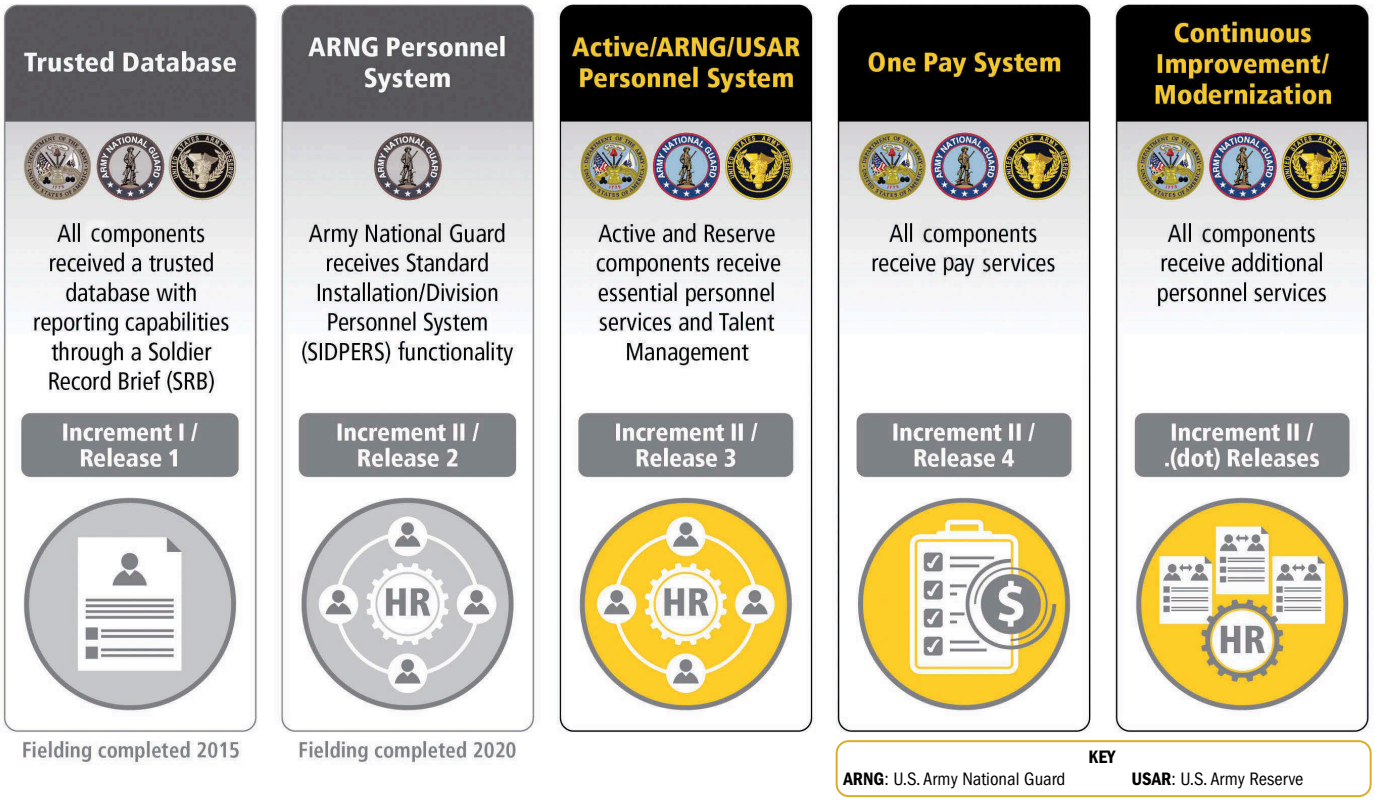
accessions and separations, address changes, incentive pay and seniority dates. Army National Guard Soldiers are paid more accurately and more timely because IPPS-A has a 98 percent accuracy rate in these pay transactions.

Release 3 of the system, which will go live in December, will integrate active-duty and Reserve Soldiers. It will fully subsume an additional 13 legacy systems, serve 1.1 million Soldiers, and be one of the largest HR enterprise resource planning systems in the world. In addition to Release 2 capabilities, Release 3 will add the foundation for leave requests, retirement points, military pay and data services within the system. Release 3 also will include initial talent management capabilities, including the 25-point Soldier talent profile. In that profile, IPPS-A will track both Army system-captured data and information entered into the system by Soldiers, including civilian and military education, awards, attributes, personal goals, civilian work experience and preferences.

In the upcoming years, Release 4 will allow IPPS-A to become the authoritative system for military pay. Subsequent releases will increase functionality in each capability area, reduce reliance on outdated legacy systems, and deliver continuous improvement and modernization for users based on Soldier feedback, business process and software updates, and technological advances. At full deployment, IPPS-A will subsume over 30 legacy systems and eliminate over 300 interfaces—providing essential capabilities to the Army, including total force visibility, talent management and auditability. With total force visibility, commanders will use specialized tools within IPPS-A to see, organize and analyze data about every Soldier. Commanders can use these robust tools and reports, which have never been available in one system, to make better-informed decisions when reporting and reviewing command strength to support readiness. Managing talent

Army leaders believe providing Soldiers with more choices in their careers will incentivize Soldiers to perform better and stay longer. Thereby, Soldiers will make the Army stronger.

TRAINING IN SESSION
The IPPS-A team has conducted extensive training for users, to familiarize them with the new interface and to ensure the rollout is smooth for HR professionals and Soldiers alike. (Photo by Staff Sgt. Jim Heuston, National Guard Professional Education Center)



TIMELINE TO DEPLOYMENT

IPPS-A has been fielded in two increments and three releases so far. Release 3 is scheduled for December 2021 and will be followed by Release 4 at a later date. (Graphic by IPPS-A)

will be automated to maximize Soldier potential by allowing leaders to differentiate and understand the knowledge, skills and behaviors of Soldiers across the Army. Delivering an audit capability—a secure, comprehensive and searchable tool to support total force readiness, Soldier financial readiness and Soldier career mobility—ensures that the Army's personnel and pay are compliant with congressional requirements.

INNOVATIVE CAPABILITIES

IPPS-A represents a revolutionary leap forward for Army HR and information technology. Within IPPS-A, transactions are secure, automated, paper-free and trackable from initiation to approval—providing a level of transparency as never before. Digitally automating the approval process for personnel actions reduces manual tracking, response-time delays and loss of documents. IPPS-A's ability to combine personnel and pay functions (e.g., a promotion or call to active duty) will address current inefficiencies caused by complex interfaces among more than 30 stove-piped HR systems, thereby leaving fewer opportunities for error. For the first time ever, all three components will have a consolidated, authoritative and comprehensive source of Army personnel and pay information within IPPS-A.

It will benefit not only HR professionals, but Soldiers and leaders, too. With IPPS-A, Soldiers will have one record for their entire career, even if they switch components. They also will have 24/7 access to their personnel records and self-service capabilities online and through a mobile app—saving time for Soldiers to spend on their mission and with their families. Additionally, providing Soldiers an avenue to express their knowledge, skills, abilities

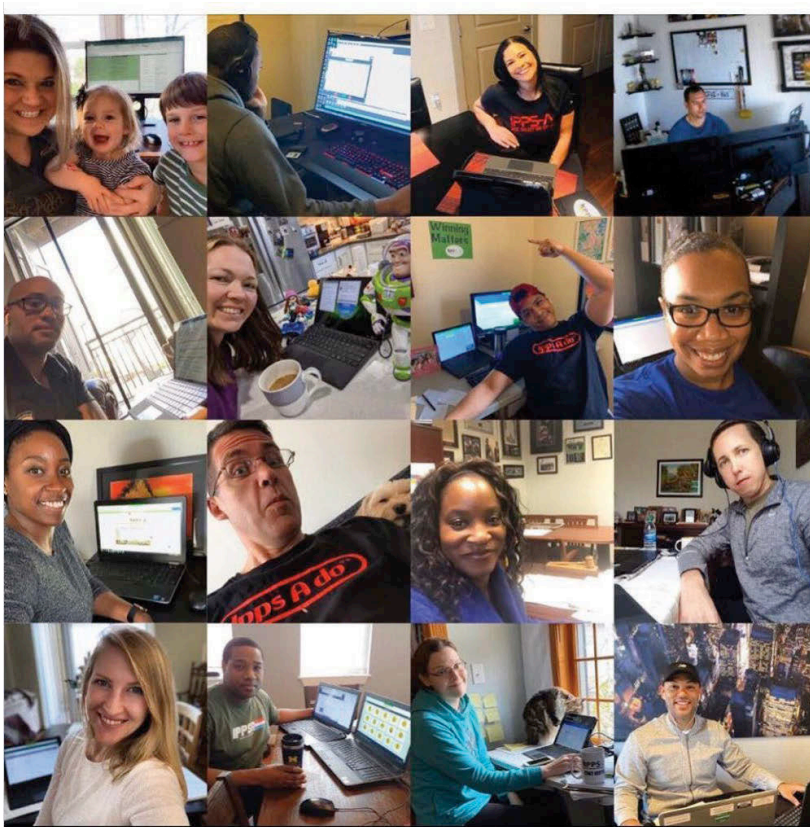
and preferences delivers two things they want: recognition for their unique talents and more control over their Army careers. Army leaders believe providing Soldiers with more choices in their careers, such as consideration for their preferred jobs and locations, will incentivize Soldiers to perform better and stay longer. Thereby, Soldiers will make the Army stronger.

Leaders can see the 25-point Soldier talent profile for every Soldier in all three components. Ultimately, this 360-degree view of each Soldier will help leaders make better informed talent decisions, ensuring that the right Soldier is paired with the right job. For example, during a pandemic such as COVID-19 that requires personnel with medical skills, certifications and training, commanders could easily input these requirements and search for Soldiers in any component, in any physical location, to support the mission. IPPS-A eventually will initiate a talent marketplace for assignments of enlisted Soldiers and officers that combines one standard model with the talent profile to match assignment preferences between units and Soldiers for all three components. Soldiers will be able to see positions that are available to them, and Soldiers and units can interact and network to increase Soldier, unit and family satisfaction. In turn, IPPS-A will facilitate assessment management and streamline career and succession planning.

For HR professionals, IPPS-A provides automated workflows for pay-impacting HR transactions, such as promotions, to avoid pay delays that may occur in current systems. Streamlined processes not only increase efficiency and productivity, but also reduce errors caused by inaccurate and repetitive data entry. This will ensure Soldiers receive entitled benefits and timely, accurate pay—avoiding financial hardships for Soldiers and their families. IPPS-A is an online solution to fill the capability gap in personnel, pay, talent and data; enhance total Army readiness; and improve the lives of Soldiers and families as part of the Army People Strategy.

CHANGING THE WAY THE ARMY DOES BUSINESS

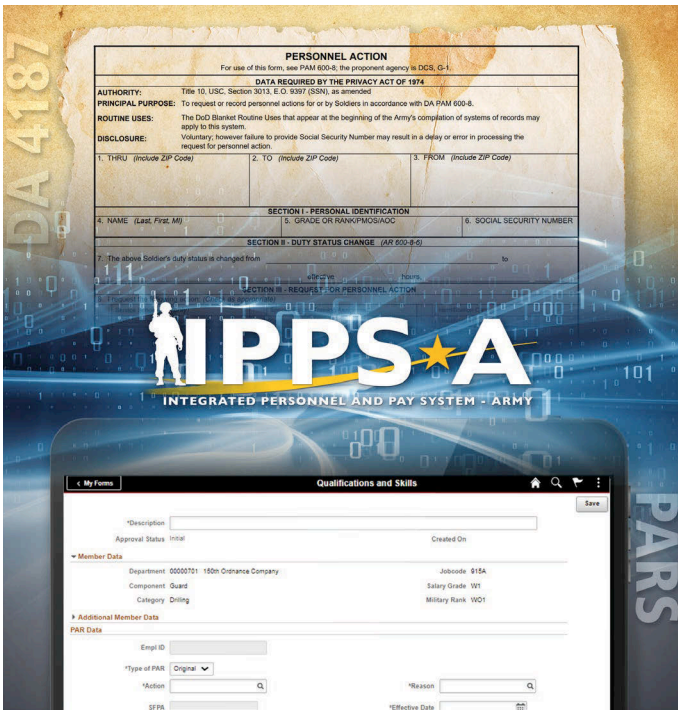
The transition to IPPS-A will change how the Army manages personnel actions. Come December, over 150 business processes across three components will be condensed into 46 standardized business processes. This change necessitates updates to laws, regulations and policies. IPPS-A's most recent operations order providing guidance to commands and units, fragmentary order 5 published in August 2020, detailed the initial 187 laws, regulations and policies requiring modification. These included those that govern military pay and allowances, personnel accounting and strength reporting, military awards, command policy



IPPS-A ALL DAY

Despite the challenges posed by COVID-related telework, the IPPS-A program has completely rolled out the system to the National Guard, and is continuing to prepare for Release 3, when the active and Reserve components migrate to IPPS-A. (Photo by Justin Creech, IPPS-A)

For the first time, all 350,000-plus Army National Guard Soldiers are performing electronic self-service personnel action requests, such as changes to marital status, name and beneficiaries.



FAREWELL, FORMS
IPPS-A is shredding the Army's reliance on paper forms for HR actions. The DA Form 4187 and DA Form 31 will soon be submitted electronically via the Personnel Action Request and Absence/Leave requests in IPPS-A. (Graphic by Justin Creech, IPPS-A)

and more, replacing outdated references and adding new policy information.

Over the last year, IPPS-A's HR transformation team worked with affected Soldiers, HR professionals, commands and units to review key changes and decisions that need to be made to prepare for Release 3. Areas of discussion included audit and internal controls, military pay error resolution, and tools to manage interactions with Soldiers using the system (known as customer relationship management). The team also conducted HR transformation summits during the summer and fall of 2021.

These summits served several purposes. First, they provided a forum for IPPS-A experts to educate the field on the system's benefits. They also communicated critical knowledge—a lesson learned from Release 2 about how to use IPPS-A—and how end-to-end business processes work both inside and outside of IPPS-A.

Finally, these summits set conditions for IPPS-A Release 3—how organizations will function in the new environment and how roles, responsibilities and processes will change. This information will ensure HR transactions are performed correctly in the system and will facilitate a smooth transition in December.

To prepare the Army for this major change in HR and pay practices, IPPS-A communicated directly with leaders and experts in all three components; requested and acted upon feedback and lessons learned; developed and distributed educational products; and shared information through discussions, correspondence and social media. These efforts had positive impacts on the system build, requirements and training—enabling the Army to adapt for tomorrow.

CONCLUSION

Modernization efforts will not stop in December. IPPS-A will continue to refine and improve upon the system through 2030. Once Release 3 is fielded in late December 2021, focus will shift to Release 4, which will incorporate additional functionality like base pay, taxes, allowances, bonuses, allotments and leave.

IPPS-A is the Army's future, and there is still much more to come.

For more information, go to ***https://ipps-a.army.mil/****.*

COL. REBECCA EGGERS became the functional management division chief for IPPS-A in 2021. She holds an MBA in human resource management from the University of Wisconsin – Whitewater and an M.S. in national resource strategy from the Eisenhower School, National Defense University. She is a career Army Adjutant General's Corps officer, commissioned through the Reserve Officer Training Corps program at Bryant College, where she earned a B.S. in accounting. Before IPPS-A, she served as the division G-1, Combined Joint Forces Land Component Command – Operation Inherent Resolve J-1, Iraq, for the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, and as the executive officer, joint management officer and 4-star and 3-star nominations officer in the Army General Officer Management Office, Washington. She also served as the deputy chief, XVIII Airborne Corps, Readiness Division, for the Enlisted Personnel Management Division at Army Human Resources Command, Fort Knox, Kentucky, and she deployed to Kuwait to serve as the chief, Personnel Accounting and Strength Reporting Branches, for U.S. Army Central.

SATONYA HOBSON-WILLIAMS

COMMAND/ORGANIZATION: Javelin Missile System Product Office, Tactical Aviation and Ground Munitions Project Office, Program Executive Office for Missiles and Space

TITLE: Javelin chief engineer

YEARS OF SERVICE IN WORKFORCE: 22 years

AAW/DAWIA CERTIFICATIONS: Level III in engineering and Level III in program management

EDUCATION: MBA, Auburn University; B.S. in mechanical engineering, Mississippi State University

AWARDS: Army Civilian Service Achievement Medal

AIMING FOR SPACE

Satonya Hobson-Williams never intended to become an Army civilian. As a child growing up in Mississippi, she had a different goal in mind—she dreamed of becoming an astronaut. When she enrolled in college, she set out to earn a degree in aerospace engineering, but then she got some advice that changed the entire course of her career. "I was talking with some professors and advisers, and at the time, there weren't many opportunities for aerospace engineers," she said. "So, I started looking for other things I could do, where I could still do *some* aerospace, but with a broader focus." She decided on a degree in mechanical engineering, which led to her first job working for the Tennessee Valley Authority (TVA).

"After graduation, I went to work with TVA as a non-destructive engineer, which meant I was testing hardware in a way that doesn't break it." She later married, left the TVA, and went to work for General Electric Co. as a tool and process engineer in Decatur, Alabama. "They make refrigerators," she chuckled. "Still not quite an astronaut." She developed an interest in programming equipment, which she did for several years before moving to her next job as a project manager at DaimlerChrysler. From refrigerators to cars—she was getting closer.

In her next role, she entered the Army workforce as a production engineer on the Hydra 70 rocket, a 2.75-inch diameter fin-stabilized unguided rocket used primarily in an air-to-ground role. "Finally, I was getting there," she said. Over the next few years, she worked her way up to assistant product manager before moving to Project Manager Unmanned Aerial Systems. From there, she branched out to a new role at the Missile Defense Agency, before returning to the Hydra 70 as chief engineer, and then to the Javelin as engineering division chief within the Tactical Aviation and Ground Munitions (TAGM) project office.

"The Javelin is a shoulder-launched, man-portable, 'fire and forget,' medium close combat missile," she said. "I provide technical insight informing the decisions of both the product and project managers. As the technical lead, I am responsible for the modernization and sustainment of the Javelin missile for our Army warfighter." She directs the engineering team to lead development and transition-to-production activities for the Javelin missile and the Command Launch Unit, a reusable stand-alone component that provides surveillance capability for troops. Her work includes component-level design reviews, integrated systems test planning, performance verification tests and baseline discussions with TAGM management. "I get satisfaction from my position because we provide Soldiers with the hardware needed when they are on the ground," she said.

She said there are many differences between her experiences in industry and her career as an Army civilian, but she loves to ask questions and learn as much as she can. "I'm one of those people who likes to understand a little bit about everything, so I have a good grasp of why people ask the questions they're asking, to understand their point of view. It makes it a little easier for me to find the right solution." One of the major differences she first encountered was the pace of work, which had been very demanding working on the production floor for an auto manufacturer. "The biggest transition

for me was the alternate work schedule. I really liked that aspect of coming and working as a civilian."

Throughout her time in the Army Acquisition Workforce, she said she has given advice to several junior acquisition personnel. "I typically give them five principles for the work environment," she said. "One, get to know and be known by others in your work environment. Two, keep things positive. Three, make your career development a priority. Four, ask for feedback. Five, respect the time you have with people to glean information on how things are done." Hobson-Williams attended the Civilian Education System (CES) Advanced course in 2018, and she said she learned a lot about her own approach to leadership. "The main thing that I got out of the training was understanding my leadership philosophy. Leadership is the ability to inspire people to do things that they didn't realize they were capable of doing."

In addition to the CES Advanced course, she makes time for additional training and study whenever possible, and she has learned an important lesson that guides her work for her team. "Not everyone's journey is going to be the same. I read this book, "Sticking Points," [by Haydn Shaw] and it's about having four or five generations working in a particular industry at one time, and how no one thinks the same and no one approaches a problem in the same way, and how they become sticking points for us." For example, some people working in an office environment prefer making phone calls to their colleagues, some prefer the "walk and talk" method of dropping in to a teammate's office, and yet others may prefer to send a text or a Microsoft Teams message. "I'll burn some extra calories walking. But understanding and embracing those differences, that's the biggest thing."

FIRE AT WILL

Norwegian soldiers of the Telemark Battalion fire an FGM-148 Javelin during a combined arms live fire training exercise at Al Asad Air Base, Iraq, in June 2020. The Javelin is a portable, compact, lightweight, anti-tank missile system. (Photo by Spc. Derek Mustard, Combined Joint Task Force – Operation Inherent Resolve)

She also has a unique perspective on career progression, based on her own experience moving across several industry jobs before entering the Army civilian workforce. "In this day and age, most people are not going to stay with the same company for 20 years. Some people feel like, if you don't stay five or 10 years, you're not interested in having a career, but I have a different view of that," she said. "What I tell people is that you want to be well-rounded as far as understanding how your work affects everything else." In other words, know precisely what you bring to the table, no matter where you are on the organization chart. "If you're working the rocket launcher, it's important. Some people will say, 'No it isn't—the most important thing is the missile.' " But you can't fire the missile without the launcher, no matter how you try. "Without the launcher, you have a nice, shiny missile," she laughed. "You can't do anything without a launcher." The point isn't the missile or the launcher, she said. It's the system. "Take a look at all the steps required for us to provide a piece of hardware to Soldiers. It's really a system. That's something I talk to young engineers about."

Another thing she likes to talk about is directly related to her Mississippi upbringing. "I'm definitely a foodie," she said. "Anytime I am going TDY [temporary duty], I always start planning where I'm going to eat while I'm there." She will happily discuss her favorite TDY restaurant experiences (ask her about the Ethiopian food and spiced tea in Tucson, Arizona), but she's known for a recipe she learned closer to home. "I would always take my kids down to New Orleans to get beignets and muffalettas," she said. They're grown now—two have graduated college and the third will finish high school this year—but they still love her cooking. "My two signature dishes are my chicken and sausage jambalaya and my lasagna," she said.

What's next for Hobson-Williams? "I haven't really decided. I'm kind of still searching for my next five-year plan before I retire," she said. "I'm looking to see where I would fit best within the Army, and where I can help to meet a strategic goal that the Army has." Her sights were originally set on space, but now she's looking for her own final frontier—an opportunity to contribute to the Army's success through her unique skills and experiences.

—ELLEN SUMMEY

ON THE MOVE

UNDERSECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

SHYU CONFIRMED AS USD(R&E)

The Hon. Heidi Shyu was confirmed July 22 by the Senate as the undersecretary of defense for research and engineering. In this position, which is also known as DOD chief technology officer, she oversees the department's research and development and test and evaluation enterprise. Shyu served as assistant secretary of the Army for acquisition, logistics and technology from 2012 to 2016.

JOINT PROGRAM EXECUTIVE OFFICE FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR DEFENSE

CHANGE OF COMMAND AT JPM CBRN MEDICAL

Lt. Col. Amanda Love assumed the position of joint product manager for Chemical, Biological, Radiological and Nuclear Medical (CBRN Medical) from **Lt. Col. John Nuckols** during a change of charter ceremony July 8 at Fort Detrick, Maryland. Love served most recently as the Carl R. Darnall Army Medical Center executive officer at Fort Hood, Texas. She has previously held multiple roles at the U.S. Army Medical Materiel Agency at Fort Detrick. (Photo by Scott Brown, CBRN Medical)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PROGRAM EXECUTIVE OFFICE FOR AVIATION

1: NEW CHIEF OF STAFF AT PEO AVIATION

Rodney Davis joined the headquarters staff at the Program Executive Office (PEO) for Aviation as the new chief of staff on May 26, following the retirement of the former chief of staff, **Richard Tyler**. Davis previously served as the deputy project manager for the Cargo Helicopters project office.

2: CHANGE OF CHARTER FOR APACHE PRODUCTION AND FIELDING

Lt. Col. Matt Woolsey, second from left, incoming product manager for the Apache Production and Fielding product office, accepted responsibility from **Col. Jay Maher**, project manager for the Apache Attack Helicopters project office, during a change of charter ceremony June 24 at Redstone Arsenal, Alabama. **Lt. Col. Jeff Poquette**, far right, relinquished responsibility of the office and will attend the Air War College. **Anthony Dupree**, far left, production and fielding deputy product manager, performed guidon bearer duties for the ceremony. (Photo by Shannon Kirkpatrick, PEO Aviation)

3: LEADERSHIP CHANGE FOR AERIAL COMMUNICATIONS AND MISSION COMMAND

Gerry Cox accepted the charter for the Aerial Communications and Mission Command product office from **Col. Johnathan Frasier**, project manager of the Aviation Mission Systems and Architecture project office, during a change of charter ceremony held May 14 on Redstone Arsenal. (Photo by Carynn Ireland, PEO Aviation)

4: RETIREMENT HONORS 27 YEARS OF SERVICE

Lt. Col. Travis Harris, right, received his certificate of retirement from **Col. Roger Kuykendall**, project manager for the Aviation Turbine Engines project office, during a ceremony June 8 at Redstone Arsenal. Before his retirement, Harris relinquished his role as the product manager for the Improved Turbine Engine program office, a position he held since 2018, to **Lt. Col. Kelley Nalley**, not pictured, during a change of charter ceremony. Harris retires with 27 years of service to our nation. (Photo by Samantha Bedwell, PEO Aviation)

5: 22-YEAR CAREER CELEBRATED AT RETIREMENT

Lt. Col. Jeff Jablonski, right, accepted his certificate of retirement from **Brig. Gen. Rob Barrie**, the program executive officer for Aviation, during a ceremony April 29 at the PEO Aviation headquarters on Redstone Arsenal. Jablonski was also awarded the Legion of Merit and received other retirement mementos in recognition of his service. He served on the G-3 staff within the PEO Aviation headquarters and had previously been the product manager for Special Electronic Mission Aircraft in the Fixed Wing project office. Jablonski was commissioned as an armor officer in 1998 and was a member of the Army Acquisition Corps. He retired with more than 22 years of service to our nation. (Photo by Michelle Miller, PEO Aviation)

1: NEW LEADER FOR LAKOTA HELICOPTER

Col. Calvin Lane, project manager for the Utility Helicopters project office, presented the charter for the Lakota Helicopter product office to **Tim Vinson** during a change of charter ceremony July 1 at the Bob Jones Auditorium on Redstone Arsenal. Vinson succeeds **Lt. Col. Will Cabaniss**, whose next assignment is with the Army Rapid Capabilities and Critical Technologies Office as the project manager for the Indirect Fire Protection Capability-High Power Microwave/High Energy Laser office. (Photo by Nathan Letson, PEO Aviation)

2: CHIEF OF STAFF CELEBRATES RETIREMENT

Richard Tyler accepted a set of PEO Aviation leader and project officer coins from **Brig. Gen. Rob Barrie**, program executive officer for Aviation, during Tyler's retirement ceremony May 26 on Redstone Arsenal. During the ceremony, Tyler also received the Department of the Army's Civilian Service Commendation Medal. Tyler served in various leadership positions within PEO Aviation throughout his 20-plus-year civilian career, including chief engineer for the Unmanned Aircraft Systems project office, deputy project manager of the Apache project office, assistant PEO for Acquisition Systems Management and most recently as PEO Aviation chief of staff. (Photo by Michelle Miller, PEO Aviation)

3: SUAS PRODUCT OFFICE CHANGES HANDS

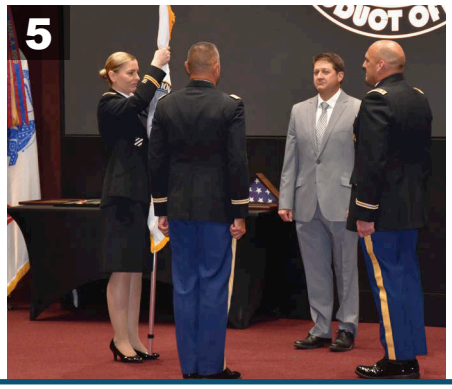
Carson L. Wakefield, left, accepted responsibility for Soldier Unmanned Aircraft Systems product office from **Col. Joseph Anderson**, project manager Unmanned Aircraft Systems, during a change of responsibility ceremony on June 17 at Bob Jones Auditorium on Redstone Arsenal. The outgoing product manager, **Dr. Carlos A. Correia**, moves on to his next assignment as product manager for the PEO Soldier Air Warrior product office. Wakefield's previous assignment was the deputy product manager for Aerial Communications and Mission Command in the Aviation Mission Systems and Architecture project office. (Photo by David Hylton, PEO Aviation)

4: CHANGE OF CHARTER FOR ITA PRODUCT DIRECTOR

Col. James DeBoer, left, project manager for the Fixed Wing project office, passed the colors to **Jim Pruitt**, right, signifying the official transfer of responsibility and authority as the product director for Fixed Wing's International and Transport Aircraft (ITA) product office during a change of charter ceremony June 17 at the PEO Aviation headquarters on Redstone Arsenal. Pruitt succeeds **Gerry Cox**, center, who recently accepted his new role as the product manager for Aerial Communications and Mission Command in the Aviation Mission Systems and Architecture project office. **Scott Thovson**, not pictured, deputy product director for ITA, also participated in the ceremony. (Photo by Tracey Ayres, PEO Aviation)

5: TURBINE ENGINE WELCOMES NEW PM

Lt. Col. Kelley Nalley, left, accepted the Improved Turbine Engine program office flag, signifying the transfer of responsibility as product manager, from **Lt. Col. Travis Harris**, far right, during a change of charter ceremony June 8 at Redstone Arsenal's Bob Jones Auditorium. **Col. Roger Kuykendall**, center front, and **Brent Logan**, center rear, also participated in the ceremonial flag transfer. (Photo by Samantha Bedwell, PEO Aviation)



6: PRODUCT MANAGER CELEBRATES RETIREMENT

Lt. Col. Ty LaStrapes, right, accepted his certificate of retirement from **Brig. Gen. Rob Barrie**, the program executive officer for Aviation, during a ceremony held in LaStrapes' honor May 14 on Redstone Arsenal. Barrie also presented him with the Legion of Merit medal. Before his retirement, LaStrapes relinquished his role as the product manager for Aerial Communications and Mission Command product office in the Aviation Mission Systems and Architecture project office, a position he held since 2018, to **Gerry Cox** during a change of charter ceremony. LaStrapes enlisted in the Army in 1995 and was commissioned in the Signal Corps in 1998. He retired with more than 26 years of service to our nation. (Photo by Carynn Ireland, PEO Aviation)

PROGRAM EXECUTIVE OFFICE FOR COMMAND, CONTROL, COMMUNICATIONS – TACTICAL

7: NETMOD WELCOMES NEW PRODUCT MANAGER

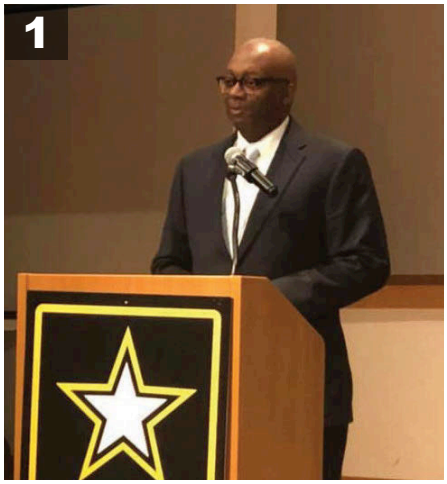
Col. Shane Taylor, left, project manager for Tactical Network at the Program Executive Office for Command, Control, Communications – Tactical (PEO C3T), hosted a change of charter ceremony to welcome **Robert Tisch**, right, as product manager for Network Modernization. The Feb. 11 ceremony was live streamed to a virtual audience from the Myer Auditorium at Aberdeen Proving Ground, Maryland. The outgoing product manager, **Matthew Maier**, is now the project manager for Interoperability, Integration and Services, also at PEO C3T. (Photo by Lynn Harkins, Project Manager Tactical Network)

8: NEW PM FOR MISSION NETWORK

Product Manager for Mission Network **John Gillette**, right, accepted the Mission Network charter from **Col. Shane Taylor**, project manager for Tactical Network, during a ceremony April 26 at the Myer Auditorium, Aberdeen Proving Ground. Gillette assumed the position from the former product manager, **Lt. Col. Stuart McMillan**. (Photo by Lynn Harkins, PEO C3T)

9: CAPABILITY SET DEVELOPMENT CHANGES HANDS

Lisa Bell assumed responsibility for the Product Lead for Capability Set Development in a ceremony hosted by **Matt Maier**, center, project manager for Interoperability, Integration and Services, on June 4 at Aberdeen Proving Ground. Bell assumes the role previously held by **Jerry Harper**, right, who transitioned to his new position as product manager for Helicopter and Multi-Mission Radios. Bell previously served as the deputy product lead for Capability Set Development and was instrumental in establishing this new office and building an exceptional team. (Photo by PEO C3T Public Affairs)



1: HAMMR WELCOMES NEW PM

Jerry Harper assumed responsibility for Product Manager Helicopter and Multi-Mission Radios (HAMMR) from outgoing product manager **Lt. Col. Brandon Baer** during a ceremony at Aberdeen Proving Ground on June 11. Harper comes to HAMMR after serving as the product lead for Capability Set Development under Project Manager Interoperability, Integration and Services. Baer departs HAMMR to attend National Defense University's Eisenhower School for National Security and Resource Strategy.

PROGRAM EXECUTIVE OFFICE FOR ENTERPRISE INFORMATION SYSTEMS

2: DEPUTY PEO DEPARTS

Brendan Burke departed the Program Executive Office for Enterprise Information Systems (PEO EIS) and the civilian service on June 18 after serving more than two years as the deputy PEO and a decade at the organization. His past PEO EIS assignments include project director for Computer Hardware, Enterprise Software and Solutions; product director for General Fund Enterprise Business System Increment II; and product manager for Installation Information Infrastructure Modernization Program. At a farewell event at PEO EIS headquarters on Fort Belvoir, Virginia, Program Executive Officer **Ross Guckert** presented Burke with the Superior Civilian Service Medal for his exemplary performance while serving as deputy PEO. **John Howell**, the PEO EIS assistant program executive officer for Networks, Cyber and Services, will serve as acting deputy PEO until a permanent replacement is named. (Photo by Laura Edwards, PEO EIS)

3: CHANGE OF CHARTER AT ACT

Arthur Edgeson assumed responsibility as product lead for the Defensive Cyber Operations (DCO) Applied Cyber Technologies (ACT) product office during a change of charter ceremony on June 4. Edgeson replaces outgoing product lead **Lt. Col. Peter Amara**, who is attending Senior Service College. Edgeson most recently served as deputy product manager for Cyber Analytics and Detection at DCO.

4: NEW PROJECT MANAGER AT DCATS

Col. Justin "Jay" Shell accepted the charter for Defense Communications and Army Transmission Systems (DCATS) from acting project manager **Aric Sherwood** in a ceremony at Fort Belvoir, Virginia, on June 21. Shell previously served as the chief of staff of the Defense Assisted Acquisition Cell within the Joint Rapid Acquisition Cell under the Under Secretary of Defense for Acquisition and Sustainment. Sherwood currently serves as acting assistant program executive officer for Networks, Cyber and Services at PEO EIS.

5: P2E HOLDS CHANGE OF CHARTER

Thomas "Tom" Dunaway, right, received the charter for Power Projection Enablers (P2E), a product office within the Defense Communications and Army Transmission Systems (DCATS) portfolio, from DCATS project manager **Col. Jay Shell**, center, in a change of charter ceremony at Fort Belvoir on June 25. Dunaway replaces **Lt. Col. Howard Donaldson**, left, who departed for a position at the National Reconnaissance Office. (Photo by Laura Edwards, PEO EIS)

6: CHANGE OF CHARTER AT CAD

Lt. Col. Dakota Steedsman, right, was introduced as the new product manager for Cyber Analytics and Detection (CAD) during a change of charter ceremony at Fort Belvoir on July 9. Defensive Cyber Operations project manager **Col. Mark Taylor**, center, welcomed Steedsman, who takes over from **Lt. Col. Leilani Tydingco-Amarante**, left, who has been selected for promotion and assigned to serve as the military deputy to the deputy assistant secretary of the Army for plans, programs and resources. (Photo by Laura Edwards, PEO EIS)

7: ATIS WELCOMES NEW PRODUCT MANAGER

Timothy Hale, right, accepted responsibility as the product manager for Army Training Information System (ATIS) during a July 15 assumption of charter ceremony hosted by Army Data and Analytics Platforms (ARDAP) project manager **Col. Robert Wolfe**, left, at the ATIS office in Newport News, Virginia. Former ATIS product manager **Lt. Col. Jim Lee** retired earlier this year. The assumption of charter ceremony also marks the transition of ATIS to PEO EIS's ARDAP portfolio from the Defense Integrated Business Systems portfolio. (Photo by Bill Ernst, ATIS)

8: LEADERSHIP CHANGE AT EBS-C

Preston Hayward, right, assumed responsibility as product lead for Enterprise Business Systems – Convergence (EBS-C), a product office within PEO EIS's Army Data and Analytics Platforms (ARDAP) portfolio, at a change of charter ceremony hosted by ARDAP project manager **Col. Robert Wolfe**, center, at Fort Belvoir on July 16. Hayward, the former deputy product lead for PEO EIS's Computer Hardware, Enterprise Software and Solutions product office, replaces former EBS-C product lead **Jeannie Winchester**, left, who is attending Senior Service College. (Photo by Laura Edwards, PEO EIS)

1: CHANGE OF CHARTER AT CPS

Lt. Col. Bradley Son accepted the charter as product manager of Defensive Cyber Operations' Cyber Platforms and Systems (CPS) in a change of charter ceremony July 28. Son, who recently completed an MBA at George Mason University, assumed the role from outgoing product manager **Lt. Col. Michael Lind**.

PROGRAM EXECUTIVE OFFICE FOR MISSILES AND SPACE

2: RETIREMENT CAPS 22-YEAR CAREER

Col. Christopher Snipes, left, project manager for Tactical Aviation and Ground Munitions (TAGM) at the Program Executive Office for Missiles and Space (PEO MS), presided over the retirement ceremony for Chief Warrant Officer 4 **Adrian Rushton**, right, April 16 at Redstone Arsenal, Alabama. Rushton served as a senior military technical adviser and field liaison, as well as the assistant program manager for the Attack Reconnaissance Aircraft Competitive Prototype Launcher Test Set and the Integrated Munition Launcher for TAGM. He was presented with the Legion of Merit award for exceptionally meritorious service over a 22-year military career. (Photo by Gloria Bell, PEO MS)

U.S. ARMY ACQUISITION SUPPORT CENTER

3: USAASC WELCOMES NEW DIRECTOR

Ronald R. "Rob" Richardson Jr. assumed the role of director of the U.S. Army Acquisition Support Center and director of Acquisition Career Management at Fort Belvoir, Virginia, on Aug. 2. In this role, he oversees the Army Acquisition Corps and the Army Acquisition Workforce, and supports the Army's program executive offices in the areas of human resources, resource management, program structure, acquisition information management and program protection. Richardson previously served as the director of Acquisition and Operations for PEO Soldier, and the deputy project manager for the DOD Healthcare Management System Modernization Program. Richardson takes the helm from the previous director, **Craig A. Spisak**, who retired in July after 35 years of public service.

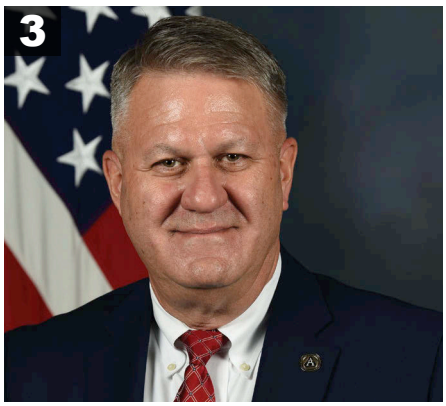
U.S. ARMY AVIATION AND MISSILE COMMAND

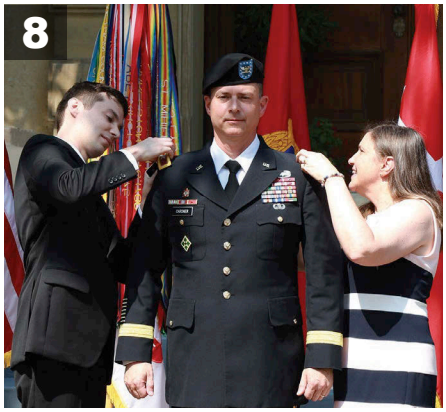
4: NEW DEPOT COMMANDER AT LETTERKENNY

Col. Rick Allbritton assumed the role of commander of Letterkenny Army Depot, Pennsylvania, during a July 29 ceremony hosted by **Maj. Gen. Todd Royar**, commander of the U.S. Army Aviation and Missile Command. Allbritton previously was assigned to the Joint Special Operations Command, Fort Bragg, North Carolina.

5: AVIATION BRANCH WELCOMES MAINTENANCE OFFICER

Chief Warrant Officer 5 Patrick O'Neill assumed the duties as the U.S. Army Aviation and Missile Command aviation and branch maintenance officer in July. O'Neill's previous assignments include five deployments in support of Operation Iraqi Freedom and Operation Enduring Freedom; brigade aviation maintenance officer of the 1st Air Cavalry Brigade, Fort Bliss, Texas; and brigade aviation maintenance officer at 1st Armored Division, Fort Hood, Texas.





U.S. ARMY CONTRACTING COMMAND

6: NEW CG TAKES COMMAND

Army Contracting Command (ACC) hosted a change of command ceremony June 21 in Huntsville, Alabama, in which **Brig. Gen. Christine A. Beeler.** center, became the commanding general.

The ceremony, hosted by **Lisha Adams**, left, executive deputy to the commanding general of the U.S. Army Materiel Command, also marked the retirement of **Maj. Gen. Paul H. Pardew**, right, who relinquished command to Beeler. Beeler comes to ACC from the Mission Installation and Contracting Command headquarters at Joint Base San Antonio, Texas, where she served as the commanding general. (Photo by Michelle Gordon, U.S. Army Aviation and Missile Command)

U.S. ARMY FINANCIAL MANAGEMENT COMMAND

7: USAFMCOM WELCOMES NEW COMMANDER

Col. Paige M. Jennings assumed command of the U.S. Army Financial Management Command (USAFMCOM) during a July 15 ceremony at the Maj. Gen. Emmett J. Bean Federal Center in Indianapolis. **Gen. Edward M. Daly**, commanding general of U.S. Army Materiel Command, presided over the ceremony. Jennings, who most recently served as a congressional appropriations liaison for the Office of the Secretary of Defense for Comptroller, Budget and Appropriations Affairs, commissioned into the Army Finance Corps in 1995.

The outgoing commander, **Brig. Gen. Mark Bennet**, relinquished command during a virtual ceremony May 7. Bennett, who took command of USAFMCOM in October 2019, will next serve as the director of Army Budget. (Photo by Mark Orders-Woempner, USAFMCOM)

U.S. ARMY JOINT MUNITIONS COMMAND

8: JMC COMMANDER PROMOTED TO BRIG. GEN.

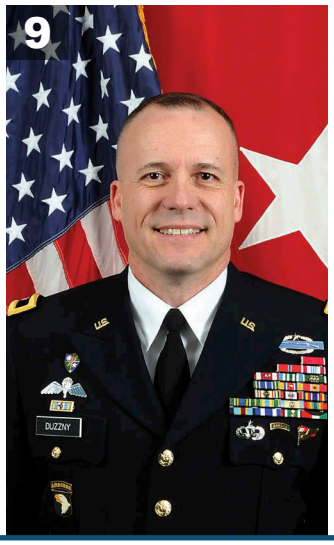
Brig. Gen. Gavin Gardner, commander of Joint Munitions Command (JMC), was promoted from colonel to the rank brigadier general during a small ceremony June 10 at Rock Island Arsenal, Illinois, and hosted by **Gen. Gustave "Gus" Perna**, chief operating officer for Operation Warp Speed. Gardner, who assumed command at JMC on June 11, 2020, was pinned by his wife, **Lisa Gardner**, and son **Bryce Gardner**. (Photo by Shawn Eldridge, Joint Munitions Command)

U.S. ARMY MATERIEL COMMAND

9: AMC WELCOMES NEW LEADERS

Army Materiel Command has welcomed new leaders at its headquarters. **Brig. Gen. Walter Duzzny**, left, assumed the role of AMC chief of staff and assistant deputy commanding general for the U.S. Army Reserve from **Maj. Gen. Robert Harter**. Harter transitioned to serve as deputy chief of Army Reserve. Duzzny previously served as deputy commanding general of Army North and director of the Army Reserve Engagement Cell.

Maj. Gen. Rodney Fogg, right, previously the commanding general of Combined Arms Support Command at Fort Lee, Virginia, transitioned to serve as Army Materiel Command's deputy chief of staff for logistics and operations, G-3. The position was previously held by **Maj. Gen. Charles Hamilton**, who now serves as the Army G-4 assistant deputy chief of staff.



U.S. ARMY MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND

1: CG PINS ON SECOND STAR

Maj. Gen. Heidi J. Hoyle, commanding general of Military Surface Deployment and Distribution Command, was promoted during a ceremony officiated by commander of U.S. Transportation Command, **Gen. Stephen R. Lyons**, April 9 at the Scott Air Force Base, Illinois. Hoyle, who assumed command in June 2020, is SDDC's fourth female commanding general and the youngest two-star general in the Army. Before taking command of SDDC, Hoyle served as the chief of ordnance and commandant of the U.S. Army Ordnance School at Fort Lee, Virginia. (Photo by Laura Marshall, Military Surface Deployment and Distribution Command)

U.S. ARMY SECURITY ASSISTANCE COMMAND

2: CHANGE OF CHARTER FOR OPM-SANG

The U.S. Army Security Assistance Command (USASAC) conducted a change of charter ceremony for the Office of the Program Manager for Saudi Arabian National Guard (OPM-SANG) on July 28. **Brig. Gen. Garrick Harmon**, USASAC commanding general, hosted the event as the outgoing program manager, **Col. John White**, relinquished his duties to **Col. Kenneth Burgess**, left.

Burgess comes to OPM-SANG from Vicenza, Italy, where he commanded the 173rd Infantry Brigade Combat Team (Airborne). White continues his service as the executive officer to the deputy commanding general of U.S. Army Training and Doctrine Command at Fort Eustis, Virginia. (Photo by Adriane Elliot, USASAC)

U.S. ARMY SUSTAINMENT COMMAND

3: ASC WELCOMES NEW CG

Army Sustainment Command (ASC) hosted an assumption of command ceremony June 15 at Rock Island Arsenal, Illinois, during which **Gen. Edward M. Daly**, right, commanding general of U.S. Army Materiel Command, welcomed **Maj. Gen. Chris Mohan**, left, as commander of ASC. **Matthew Sannito**, a member of the Senior Executive Service who serves as ASC's deputy to the commanding general, had briefly served as executive director of ASC following the retirement of the previous ASC commanding general, **Maj. Gen. Daniel Mitchell**, on May 27. Mohan comes to ASC from Kaiserslautern, Germany, where he was commanding general of the 21st Theater Sustainment Command. (Photo by Linda Lambiotte, Army Sustainment Command)

ARMY OFFICER ANNOUNCEMENTS

Army Chief of Staff Gen. James C. McConville announced the following officer assignments, promotions and retirements:

ASSIGNMENTS

Maj. Gen. (Promotable) Paul A. Chamberlain, director for Army Budget, Office of the Assistant Secretary of the Army (Financial Management and Comptroller), Washington, to military deputy for Budget, Office of the Assistant Secretary of the Army (Financial Management and Comptroller), Washington.

Maj. Gen. David C. Hill, deputy chief of engineers, deputy commanding general, United States Army Corps of Engineers, Washington, to commandant, United States Army War College, Carlisle Barracks, Pennsylvania.

PROMOTIONS

The following general officers were promoted to the rank indicated below in June and July 2021:

Gen. Charles A. Flynn, currently serving as commanding general, United States Army Pacific, Fort Shafter, Hawaii.

Maj. Gen. James J. Gallivan, currently serving as commanding general, United States Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland.

Maj. Gen. Allan M. Pepin, currently serving as commanding general, Military District of Washington and commander, Joint Force Headquarters-National Capital Region, Washington.

Brig. Gen. Gavin J. Gardner, currently serving as commanding general, Joint Munitions and Lethality, Life Cycle Management Command/Joint Munitions Command, Rock Island, Illinois.

Brig. Gen. Eric D. Little, currently serving as commanding general, White Sands Missile Range, and deputy commanding general for Developmental Testing, United States Army Test and Evaluation Command, White Sands, New Mexico.

RETIREMENTS

Maj. Gen. Peter A. Gallagher completed 38 years of service and concluded his distinguished career as director of the Future Army Network Cross-Functional Team, Fort Belvoir, Virginia, later Aberdeen Proving Ground, Maryland.

The Acquisition Leader Assessment Program

Selection for acquisition command billets is among the most critical personnel decisions the Army makes.

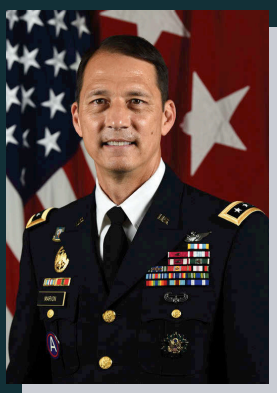
The Acquisition Leader Assessment Program (ALAP) was developed to assess officers' and civilians' readiness to lead.

ALAP is open to select O-5/GS-14 and O-6/GS-15 candidates as determined by the Centralized Selection List boards.

ALAP determines leader readiness through:

- Peer and subordinate feedback.
- Cognitive and non-cognitive assessments.
- Writing assessments.
- Physical fitness assessments.
    - Civilian participation optional.
- Panel interviews with senior Army leaders.
- Psychometric assessments.

"One of my highest priorities is identifying and developing our future acquisition leaders. The Acquisition Leader Assessment Program is designed to spotlight high-potential professionals within our team who are ready for increased leadership responsibilities in our Army Acquisition Corps."



– LTG Robert L. Marion
Director, Army Acquisition Corps

O-5 & GS-14 Program
OCT. 14 - 27, 2021

O-6 & GS-15 Program
OCT. 29 - NOV. 12, 2021

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"We as an organization have to find responsible ways to do things more quickly. Critically, once the Army's requirements process determines an acquisition program is needed to achieve a requirement, I want us postured to move as quickly as possible to carry out the program."

Mr. Douglas R. Bush
Assistant Secretary of the Army for Acquisition, Logistics and Technology ASA(ALT)(Acting)
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