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WHEN 'IT'S WHEN'

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THE VIEW FROM ABOVE

The life of an Army astronaut: Exploring the cosmos, accepting leadership, learning teamwork

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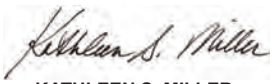

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ARMY AL&T

WINTER 2021

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From the Editor-in-Chief

Welcome to 2021! With multiple vaccines on the way and other therapeutics emerging, it has got to be better than 2020. But unfortunately COVID-19 is still affecting our day-to-day lives. Everything, as a matter of fact, including the defense of our great country. As I write this column in early December, there is unrest in Belarus and Hong Kong; U.S troop drawdowns in Afghanistan and Somalia; North Korea will probably test a missile soon and the South China Sea remains a contested area. You see, even though we are living through a pandemic and you still can't go around without a mask on, that doesn't mean the world suddenly became peaceful. Far from it.

Just as the world isn't standing still, neither are our Soldiers. They are still deploying, conducting exercises and fighting around the world. They still need state-of-the-art equipment to do their jobs, which means our Army Acquisition Workforce members can't take time off from the pandemic, either. This issue focuses on the numerous ways in which the various program executive offices, U.S. Army Futures Command and the Army Acquisition Workforce members running them are helping to thwart the pandemic by continuing to develop, acquire, field and sustain the world's best equipment and service to our troops.

It's hard enough to produce what our Army needs during normal times. Now, mix in the pandemic, teleworking, observing strict social distancing, mask wearing, and you have gone from difficult to darn near impossible … but we're doing it. Take, for example, the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND). Its whole mission is to prepare for the unimaginable. Now add to that—pandemic! Read how, as part of a DOD collaboration, it partnered with the U.S. Department of Health and Human Services to support vaccine development, thwart biological threats and navigate regulations. Agile acquisition meets agile execution at the U.S. Army Combat Capabilities Development Command (DEVCOM). Learn how Maj. Gen. John George pivoted his mission and put his team of 10,000 scientists and engineers to the task of keeping our Soldiers safe from COVID-19 by training virus-sniffing dogs, producing face coverings, researching antibodies and even sending their own personal protection equipment downrange—all in an effort to protect our greatest asset, our Soldier. Finally, join the U.S. Army Medical Research and Development Command (USAMRDC) on the COVID-19 front lines and fight alongside the team at the forefront of the distribution of remdesivir—a broad-spectrum antiviral treatment developed by corporate partner Gilead Sciences Inc. With USAMRDC's help, there is hope that DOD soon may be able to provide a tool to curb coronavirus infection for good.



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Finally, I want to say thank you to the many Army AL&T magazine readers and subscribers, who are also our contributors. This is my 10th year as the editor-in-chief. The magazine has changed dramatically since I began, both in format and content. While online articles and social media have greatly expanded our audience, in the end, it's the content that counts. Without you and the amazing content you provide, there would not be a magazine. Through the years, my team of expert writers, graphic artists and editors have worked with literally thousands of experts and other contributors across the Army to provide superior articles and graphics. Because of your involvement, we have been able to highlight the great work taking place throughout Army acquisition, while keeping everyone apprised of leadership priorities.

Here's to another 10 years of great stories, and of serving you. As always, if you have comments, story ideas or a story you would like to submit, please contact us at **ArmyALT@mail.mil**. We look forward to hearing from you.

Nelson McCouch III
Editor-in-Chief



IN THE FEEDBACK LOOP

A rifle squad from 3rd Brigade Combat Team, 101st Airborne Division visits Bell Flight's Arlington, Texas, facility in October. The Soldiers provided crucial feedback on the V-280 Valor cabin configuration, to inform Future Long-Range Assault Aircraft requirements from the user perspective. (Photo by Luke J. Allen, Army Futures Command)



ACHIEVEMENTS IN MODERNIZATION

For nearly a year, COVID-19 has taught us many things, including that the Army's ever-resilient acquisition enterprise delivers even when times are tough.

As the new year begins and we continue to face the challenges of COVID-19, I want to take this opportunity to express my deepest thanks to the entire Army acquisition, logistics and technology community for the creative and collaborative ways you are finding to accomplish every task—for our Soldiers, the Army and the nation. This crisis has given us an opportunity to be our very best, and I am reminded daily of the critical nature of our work and the excellence of our workforce. I could not be more proud of your extraordinary efforts to get the job done.

The Army's most important resource is our people, and your well-being and the well-being of family remains my top priority. In order to defeat COVID-19, we must remain healthy and engaged until we are all eligible for a vaccine. We must also remain steadfast in our mission to continuously modernize the force and ensure that our organizations, policies, processes and tasks that consume time, money and manpower deliver real value. As we begin to see a light at the end of the tunnel, we must stay informed, flexible and always work as a team.

Our industrial base partners are doing an exceptional job keeping us informed about their operations. Contractually, they don't have to do that, but this isn't business as usual. While there have been impacts to some Army programs, I am confident that in the long run we will overcome them. As we work to identify and mitigate risk, it is important to maintain constructive and continuous communications.

As the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), I function as the Army acquisition executive, the senior procurement executive, the science adviser to the secretary of the Army, and the Army's senior research and development official. I am also principally responsible to the secretary of the Army for all department matters related to logistics.

We have accomplished a lot of important things worth recounting. Though the ensuing list of accomplishments is quite lengthy, it is not exhaustive. I ask that you review what we have achieved together and reflect on your important role in the success of Soldiers—and in many cases our Sailors, Airmen and Marines.

I was an early proponent for numerous intelligent automation projects to both revolutionize the Army contracting processes and energize partnerships with industry to ensure the Army was moving toward cutting-edge and relevant tools.

THE PROGRAM EXECUTIVE OFFICES

The **Joint Program Office for Chemical, Biological, Radiological and Nuclear Defense** (JPEO-CBRND) has been on the front line in defense against COVID-19, providing experts and project managers to Operation Warp Speed. JPEO-CBRND's role at the center of the DOD acceleration of COVID-19 vaccines and therapeutics is truly one for the history books. Working hand in hand with the U.S. Army Medical Research and Development Command, it has been at the center of U.S. efforts to end the COVID-19 pandemic. (See related article, "Complex Mission, Clear Results," Page 28.) Both have also continued their regular work toward Army modernization at the highest level while also dealing with the variety of difficulties inherent in mass telework.

In direct support of the Army's No. 1 modernization priority, long-range precision fires, the XM1113 program within the JPEO for Armaments and Ammunition is developing a new 155 mm high-explosive projectile to demonstrate the capability of the Extended Range Cannon Artillery (ERCA) system to engage targets at more than twice the current range.

And the XM1147 Advanced Multipurpose round is the latest tank ammo modernization effort that will soon deliver overmatch lethality to our M1 Abrams fleet. We expect this capability to be in full-rate production by mid-2022.

At the **PEO for Aviation**, significant progress is being made to deliver aviation capabilities to the Army by 2030 in the Future Attack Reconnaissance Aircraft (FARA) and Future Long Range Assault Aircraft programs. The FARA competitive prototype effort completed both the initial design and risk reduction as well as the final design and risk reduction phases in 2020. The first of those, in March 2020, resulted in the selection of Bell Textron Inc. and Sikorsky Aircraft Corp. to enter the second phase.

In May 2019, I gave the go-ahead for the PEO for Command, Control and Communications – Tactical (PEO C3T) to use the middle-tier authority process to rapidly prototype the Integrated Tactical Network (ITN), which comprises a flexible commercial-solutions kit that can be rapidly inserted into the existing network. Since that time, PEO C3T has collaborated with the 1st Brigade Combat Team, 82nd Airborne Division to conduct multiple Soldier exercises and experiments to refine its Capability Set (CS) 21, which is the first instantiation of the network.

In July 2020, ITN CS 21 capabilities were the first in the Army to transition from middle-tier authority rapid-prototyping to rapid-fielding status. As the Army fields that capability set, it can now focus on CS 23, which is also approved for middle-tier rapid prototyping and will expand ITN capabilities to additional units.

At the **PEO for Combat Support and Combat Service Support**, the Joint Light Tactical Vehicle (JLTV) program transitioned into full-rate production, improving both mobility and survivability for our Soldiers and Marines. The JLTV family of vehicles gives commanders an improved protected-mobility solution and is the first vehicle purpose-built for modern battlefield networks.

The Infantry Squad Vehicle provides an increased ability to quickly move Soldiers and their equipment over complex and difficult cross-country terrain, allowing them to close on objectives with less fatigue and greater readiness. The vehicle



ARMORED UP
This past summer at Fort Carson, Colorado, modified Bradley Fighting Vehicles, known as Mission Enabling Technologies Demonstrators, and modified M113 tracked armored personnel carriers, or Robotic Combat Vehicles, were used to further develop learning objectives for the manned-unmanned teaming concept. (Photo by Jerome Aliotta, U.S. Army Combat Capabilities Development Command)

can be delivered by airdrop or helicopter, which increases the flexibility of Soldiers on the move. It is based on the Chevrolet Colorado ZR2 architecture, which will derive 90 percent of its parts from commercial off-the-shelf components. Using an innovative acquisition approach through an other-transaction authority agreement, its team awarded the production contract for this capability in just 16 months.

At the **PEO for Enterprise Information Systems** (PEO EIS), the General Fund Enterprise Business System (GFEBS), a web-based system that supports more than $164 billion in transactions, migrated to the cloud in July 2020, seven months ahead of schedule. The cloud-based data is more visible, accessible, understandable, trusted, interoperable and secure; and more easily maintained by a service provider.

PEO EIS also delivered the initial software release and deployed as scheduled the Integrated Personnel and Pay System – Army to the entire Army National Guard (50 states and four territories) in March 2020, providing integrated personnel, pay- and talent-management capabilities in a single system. The program is on schedule to bring all Army Soldiers into one single talent-management system in December 2021.

In June 2020, the **PEO for Assembled Chemical Weapons Alternatives** (PEO ACWA), reached the halfway point of its mission to destroy the remaining U.S. chemical weapons stockpile at the Blue Grass Chemical Agent – Destruction Pilot Plant in Richmond, Kentucky, and the Pueblo Chemical Agent – Destruction Pilot Plant in Pueblo, Colorado, in line with the congressionally mandated completion date of December 2023.

PEO ACWA has overcome challenges presented by an aging and obsolete stockpile of chemical weapons set for destruction using two highly automated pilot plants. During the past three years, an innovative acquisition strategy and proactive stakeholder involvement process have resulted in the acquisition and assembly of three static-detonation chamber units at the Colorado site and a larger, advanced static-detonation chamber unit at the Kentucky site. They, along with critical upgrades to the nerve agent rocket processing strategy at Blue Grass, have also helped ensure timely elimination of the chemical weapons stockpile.

The **PEO for Soldier** oversaw the rollout of the Army Green Service Uniform to recruiters, drill sergeants and select Army and Air Force Exchange Service stores, and prepared for the uniform's issue to initial entry trainees at brigade-combat training and one-station unit training locations.

Also, PEO Soldier achieved a first unit equipped for the Joint Effects Targeting System with a unit at Fort Benning, Georgia, in July 2020. The system is an Army-led, joint interest program with the Air Force and Marine Corps to develop and field a one-man-portable, handheld capability to rapidly acquire, precisely locate and accurately engage targets with precision-guided munitions, and to improve the effectiveness of engagement with unguided munitions.

In addition, PEO Soldier awarded a low-rate initial production contract for the Enhanced Night Vision Goggle – Binocular (ENVG-B) system 10 months ahead of schedule, and continued to field directed requirement ENVG-B systems to units.

The **PEO for Intelligence, Electronic Warfare and Sensors** (PEO IEW&S) partnered with Army Futures Command's Assured Positioning, Navigation and Timing Cross-Functional Team to field one of the Army's directed requirements, the Mounted Assured Position, Navigation and Timing System (MAPS). MAPS was fielded to the 2nd Cavalry Regiment in Germany, ensuring that Soldiers have assured position and timing to navigate in a GPS-degraded or -denied environment.



TACTICAL NETWORKING
Soldiers from the 5th Security Force Assistance Brigade participate in September in advanced communications training on the Integrated Tactical Network (ITN) at Joint Base Lewis McChord, Washington. Such brigades across the Army are the first to field test the ITN as a replacement communications system for the Army's legacy tactical network transport equipment. (Photo by Spc. Joseph E. D. Knoch, 5th Mobile Public Affairs Detachment)

In addition, PEO IEW&S successfully completed the Common Infrared Countermeasures Free Flight Missile Test and equipped the 1st Air Cavalry Brigade three months ahead of the acquisition program baseline objective date. This system will provide protection for air crews from enemy threats while offering a lightweight solution that assists with size, weight, power and cost challenges on aircraft.

The PEO also completed successful fielding of the full fleet of 24 Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) aircraft and Mission Equipment Packages. EMARSS is a manned aerial intelligence, surveillance and reconnaissance system that provides a persistent capability to detect, locate, classify, identify and track targets of interest timely and accurately.

At the **PEO for Missiles and Space**, the Army Integrated Air and Missile Defense program is developing an overarching

system-of-systems capability with all participating Army air defense artillery components functioning interdependently to provide total operational capabilities not achieveable by the individual element systems. The program is set to start the initial operational test and evaluation in 2021. Soldiers will undergo training before conducting the test from the fourth quarter of the 2021 fiscal year through the second quarter of the next fiscal year, and is currently scheduled to achieve initial operational capability in the third quarter of the 2022 fiscal year.

The Initial Maneuver Short-Range Air Defense (IM-SHORAD) is a directed requirement currently undergoing operational assessment. That program will field its first system in a few months, with a total of 144 systems fielded to four battalions. Also in development is a directed-energy variant. That early prototype is planned for transition in the 2023 fiscal year.

IM-SHORAD is an urgent acquisition program to deliver a near-term air defense protection that counters a wide range of air threats to the freedom of maneuver of brigade combat teams. To meet the immediate needs of the maneuver force, PEO MS is outfitting Stryker vehicles with a mission equipment package that includes a 30 mm cannon, Stinger missile system and Longbow Hellfire missiles.

The Precision Strike Missile, the Army's next-generation long-range missile, conducted three successful flight tests using the High Mobility Artillery Rocket System launcher. The missile traveled 240 kilometers, striking the target with pinpoint accuracy.

The **PEO for Simulation, Training and Instrumentation** leads development of the Persistent Cyber Training Environment system for the joint services, a platform for real-world defensive missions across boundaries and networks to sharpen readiness in cyber tactics, techniques and procedures. Currently, the system's primary user is the U.S. Cyber Command and the services' cyber components.

At the **PEO for Ground Combat Systems**, innovation secured greater capabilities for the Stryker brigade combat teams, part of our broader strategy to ensure that the Army remains the most lethal ground combat force able to deploy, fight and win against any adversary anytime, anywhere.

The Armored Multi-Purpose Vehicle, a replacement for the armored brigade combat teams' M113 Family of Vehicles, continues to progress toward production and fielding. The new vehicle addresses the M113's shortcomings in survivability and force protection, size, weight, power and cost, and its ability to incorporate future technologies.

This list is not all-inclusive, but merely highlights a few of the successes achieved by the Army acquisition enterprise.

DASA OFFICES

I welcomed the idea of bringing procurement authority closer to my office for greater effectiveness and efficiency, and accomplished this by designating the **Deputy Assistant Secretary of the Army (DASA) for Procurement** as the enterprise



GPS NOT REQUIRED

A Soldier from the 1st Armored Brigade Combat team conducts hands-on training on the Mounted Assured Positioning, Navigation and Timing System, Generation 1, a powerful suite of new hardware and software that will ensure Soldiers have assured position and timing to navigate in a GPS-degraded or -denied environment. (Photo by Sgt. Timothy Brokhoff, 1st Infantry Division)

head of the Army's contracting activity. Supporting this enterprise approach to Army contracting allows for greater engagement with the senior contracting officials to ensure contract actions align with the senior procurement executives' priorities. I also designated specific projects as "special interest," which facilitated my involvement at crucial intervals and enabled my ability to leverage subject matter experts to negotiate the customer's best value.

I was an early proponent for numerous intelligent automation projects to both revolutionize the Army contracting processes and energize partnerships with industry to ensure the Army was moving toward cutting-edge and relevant tools such as these:

- Pricing Insight automates manual pricing lookup processes required to analyze contractors' proposals.
- The Determination of Responsibility Assistant bot pulls contractor business information to populate a required memorandum to address contractor responsibility before making awards.
- Streamlining Acquisition Requirements auto-populates common data across all necessary contract documents.

By using these tools, Army contracting professionals save tremendous procurement acquisition lead times, decrease manual touch time, increase compliance, enhance user engagement and deliver operational efficiencies across the Army contracting enterprise.

Based on my experience as a small business owner, and with the help of the **DASA for Research and Technology** (DASA(RT)), I launched the Expeditionary Technology Search (xTechSearch) program, a competition targeting small businesses to uncover novel dual-use science and technology solutions to tackle the Army's most critical modernization challenges. Initiated in 2018, xTechSearch has provided increasing non-dilutive seed prizes to select small businesses to proceed in the competition.

In addition to the prizes, the xTechSearch program provides education, mentorship and networking opportunities to help integrate small businesses into the Army science and technology ecosystem. In 2020, we launched the xTech: COVID-19 Ventilator Challenge to innovators around the globe, to support our nation's efforts to combat COVID-19 and to continually seek out innovative technologies to best protect Soldiers, civilians and their families, maintain force readiness to meet global challenges, and provide support to the Federal Emergency Management Agency-led national COVID-19 response. (See "Free, Urgent and Scarce," Army AL&T Fall 2020, page 66.)

DASA DEC developed and concluded the first-ever agreement to continuously develop a virtual cyber training range in collaboration with Australia, the Persistent Cyber Training Environment.



SEEING IN THE DARK
Soldiers from 3rd Squadron, 89th Cavalry Regiment began training on the new Enhanced Night Vision Goggle – Binocular (ENVG-B) in June 2020. The ENVG-B low-rate initial production contract was awarded 10 months ahead of schedule. (Photo by Christy Graham, Fort Polk Public Affairs Office)

Our team also implemented a Small Business Innovation Research program-portfolio management structure to meet Army PEO-identified technology capability gaps. Adoption of a transparent, accountability-driven process aligns the program with the highest technical quality and best emerging tech business partners, while lowering bureaucracy and improving transition potential. The xTech SBIR pilot demonstrated a significant decrease in the time from topic curation to contract award.

Since 2017, the Office of the DASA(RT) has provided oversight of the Army's science and technology investments, and continues to work with Army Futures Command to ensure that our science and technology is fully aligned with the Army's modernization priorities. This includes ensuring that all cross-functional team requirements have been fully funded, and shifting more than $2 billion over the last three fiscal years and beyond to meet modernization priority needs, while also maintaining investments in supporting technologies with leading-edge potential, including artificial intelligence, ultra-secure communications, robotics, virtual reality, the Internet of Things, energetics, directed energy and ultra-designed materials.



STEALTH SURVEILLANCE
Soldiers from the 14th Brigade Engineer Battalion, Delta Company, prepare to launch the Shadow unmanned drone in October at North Fort Lewis, Washington. (Photo by Capt. Daniel Mathews, 2nd Stryker Brigade Combat Team, 2nd Infantry Division)

With the intent to provide system architects with a single environment within the programs and program executive offices where they can develop architecture artifacts with a common set of libraries, lexicons and style guides, the **Office of the Chief Systems Engineer** (OCSE) is piloting an Architecture Development Kit (ADK) effort. The ADK allows pilot users to build architecture products inside a single model to support their own systems engineering efforts, explore other system owners' architectures for better understanding of interoperability and the aggregation of all the architecture data within the model into system-of-systems architectures products. The pilot effort is currently underway and will conclude in a few months with a full-scale version of ADK set for the end of the current fiscal year.

Recognizing that the use of modular open-systems approaches (MOSA) in Army systems is a warfighting imperative to enable incremental development and enhance competition, innovation and interoperability, we established policy directing its use in all categories of acquisition programs, as well as middle-tier efforts. To aid the PEOs and program managers (PMs) in implementing modular approaches, OCSE developed a MOSA implementation guide to serve as a reference for applying MOSA, and to clarify the process for formal assessments of its implementation.

To formalize and standardize independent assessment of technical risk, OCSE drafted policy for the conduct of independent technical risk assessments. The policy establishes common expectations for performing and supporting such assessments, which OCSE began conducting for Acquisition Category I and special interest programs under the milestone-decision authority of the Army, and began development of a guide to provide clear direction and consistency in their conduct.



HOT NEW WHEELS

Troopers with the 3rd Armored Brigade Combat Team, 1st Cavalry Division received the new Joint Light Tactical Vehicles at the rail operations center in October at Fort Hood, Texas. These vehicles feature significant enhancements, such as a bigger payload, better occupant survivability and an all-terrain suspension system. (Photo by Sgt. Calab Franklin, 3rd Armored Brigade Combat Team)

The **DASA for Plans, Programs and Resources** (DASA PPR) established the organization's first Managerial Accounting Cell, which is regionally based to support each of the PEOs in the areas of financial reporting, contracting, logistics, payroll and labor, and other transactions. The Managerial Accounting Cell successfully completed the year-end close for the 2020 fiscal year, reducing the number of errors left on the books by 81 percent with zero outstanding, as well as canceling open invoices and unmatched transactions. In addition, at my request, the PPR team completed two lengthy financial deep-dive inquiries and published fiscal guidance and financial risk reports for ASA(ALT) leadership. We are working closely with contracting officers to close out canceling year contracts and process de-obligations of outstanding unliquidated obligations. Together with the PEOs, we are quickly clearing errors and aged accounts to preserve the Army's buying power.

DASA PPR also assessed several significant investments in improving the ability of the organic industrial base to meet national security objectives. As a result, we are achieving steady progress in the development and implementation of the Organic Industrial Base Modernization Strategy.

The **DASA for Acquisition Policy and Logistics** conducted a successful operational stock review that included $19.5 billion of inventory and identified $1.6 billion of materiel for divestment or redistribution.

To comply with the Arsenal Act, which requires the secretary of the Army to have all supplies needed by the Army to be made in government-owned factories or arsenals if this can be accomplished "on an economical basis," the Army has been working on implementing a make-or-buy policy. I ensured that a make-or-buy

Significant progress is being made to deliver aviation capabilities to the Army by 2030 in the Future Attack Reconnaissance Aircraft and Future Long Range Assault Aircraft programs.

policy was crafted and signed within 90 days. The results have been impressive, showing a significant rise in work for the arsenals from $101 million in the 2018 fiscal year to $300 million in the 2019 fiscal year.

The **DASA for Strategy and Acquisition Reform** (DASA SAR) is leading the way in the implementation of two important policy initiatives: Army intellectual property management reform, and advanced manufacturing.

Intellectual property (IP) plays a critical role in the Army's ability to develop and maintain technological superiority. In December 2018, the secretary of the Army signed Army Directive 2018-26, "Enabling Modernization through the Management of Intellectual Property." The policy alters the Army's approach to IP management through four key principles: (1) early planning for long-term IP requirements; (2) tailored IP strategies that seek only the necessary, not all, IP; (3) negotiation of prices for license rights early in the process when competition exists; and (4) open communication with industry throughout the process.

We are leading a number of implementation efforts to ensure Army-wide adoption of the policy, including a series of roadshows at key Army installations to educate local-level program, contracting and legal offices. As of this writing, DASA SAR has conducted seven roadshows at key Army installations across the country, and has reached nearly 1,500 members of the acquisition community.

Advanced manufacturing refers to new ways to manufacture both new and existing products from advances in technology. Advanced manufacturing includes additive manufacturing (also known as 3D printing), AI, robotics and high-performance materials.

In September 2019, the secretary of the Army signed Army Directive 2019-29, "Enabling Readiness and Modernization through Advanced Manufacturing." The directive establishes a unified Army strategy for using advanced manufacturing to enable two of the Army's top priorities—modernization and readiness. This will be accomplished by incorporating advanced manufacturing into all aspects of the materiel development life cycle, from early design and development through production and sustainment, modernizing the organic industrial base to supplement the supply chain, and encouraging, through contract incentives, the defense industrial base to invest in advanced manufacturing. (See "Getting Started Now," Army AL&T Fall 2019, Page 100.)

According to the **DASA for Defense Exports and Cooperation** (DASA DEC), the U.S. Army has averaged $16 billion in new sales per year, and managed an average of 6,000 foreign military sales cases annually since 2018. This goes a long way toward improving interoperability with our allies and partners.

DASA DEC developed and concluded the first-ever agreement to continuously develop a virtual cyber training range in collaboration with Australia, the Persistent Cyber Training Environment. We also developed, negotiated and concluded the Advancing Wounded Soldier Care Through Robotics project agreement with Italy, on behalf of the Office of the Assistant Secretary of Defense for Health Affairs. This is a collaborative project to develop and test advanced robotic devices and novel human-machine interfaces to restore upper and lower limb function for wounded Soldiers with amputation, paresis, and paralysis.

In addition, an overarching, 20-year research, development, test and evaluation agreement with Brazil concluded in early 2020 as the framework to conduct cooperative activities and pursue joint research-and-development projects. These include bilateral cooperation in basic research, applied research, advanced technology development, test and evaluation of systems and subsystems, and spiral development efforts.

In response to the 2019 terrorist attack at the Pensacola Naval Air Station, we led the Army response to a tasking by the secretary of defense by writing and overseeing implementation of Army policies to improve security at all Army training installations hosting international military students. This effort required the engagement and oversight of a broad coalition of experts from the U.S. Army Training and Doctrine

Command, Army Cyber Command, Human Resources Command, the Army Provost Marshal, the Army Staff, as well as the Security Assistance Enterprise. The resulting policies and procedures, affecting thousands of international military students and dozens of Army training activities, resulted in improved security at over 40 Army installations while simultaneously ensuring the Army's uninterrupted support of the DOD security-cooperation strategy.

The vision for establishing the **Army Rapid Capabilities and Critical Technologies Office** (RCCTO) centered on the need for an organization that could conduct rapid prototyping to address priority efforts and, if required, pivot on a moment's notice to address emerging threats and meet Army strategic objectives. What makes the organization unique is its structure and mission to deliver rapid experimental prototypes with residual combat capabilities in support of the Army Modernization Strategy and the National Defense Strategy, ensuring success in critical firsts that include hypersonics, directed energy, mid-range capabilities, counter-small unmanned aircraft systems and emerging technologies.

In hypersonics, for example, RCCTO is fielding a prototype Long-Range Hypersonic Weapon at the battery level by the 2023 fiscal year. In 2019, the office awarded key contracts for this effort, moving the program forward and creating the beginning of a new industrial base for the country. In March 2020, together with the Navy, the Army conducted a very successful hypersonic flight test. In 2021, the RCCTO hypersonics office will conduct more joint flight tests and deliver the first hypersonic equipment to Soldiers who will start to train and work with it firsthand.

With directed energy, RCCTO leveraged proven technologies that have been developed in the science and technology community, increased their power and adapted them for use on Army vehicles.

These directed-energy prototypes fall into three main categories: directed energy – maneuver short range air defense, indirect fire protection capability – high energy laser, and indirect-fire protection capability – high power microwave. Each of these areas has been accelerated from the previous timeline, and in the 2022 fiscal year, RCCTO will provide the first platoon of four prototype Stryker vehicles integrated with 50 kilowatt-class lasers.

We must stay informed, flexible and always work as a team.

In its newest mission, midrange capability, RCCTO marked a key achievement in 2020 by awarding a contract that will lead to the development and delivery of a new midrange fires system for the Army. For this effort, RCCTO is developing a ground-launched prototype for an operational battery by the 2023 fiscal year. In support of multidomain operations, the midrange capability will complement other critical systems in the Army's fires portfolio, including the Precision Strike Missile and the Long Range Hypersonic Weapon.

RCCTO also executed numerous projects in other areas to accelerate innovation to Soldiers. These include counter small-unmanned-aerial systems, hybrid-electric vehicle technologies, advanced radars, platform protection, cyber resiliency and many more. The office awarded multiple rapid prototyping contracts, several to small businesses, as a result of its innovation days—a partnership with Army Futures Command that aims to quickly identify and transition good ideas into operational prototypes.

THE ARMY DACM OFFICE

I have often said and I firmly believe that people are the Army's greatest asset. The acquisition workforce is absolutely essential to Army modernization, and that is why I made it a priority to ensure that our professionals receive the training, education and experience they need to fulfill their duties and responsibilities. Working with the U.S. Army Acquisition Support Center (USAASC) Director of Acquisition Career Management (DACM) and the USAASC team, we are becoming more successful at managing the talent within our workforce.

The Army Acquisition Workforce Human Capital Strategic Plan (AAW HCSP) was first published in October 2016. Over the last four years, we implemented the plan and, simultaneously, our strategic environment has evolved while Army policy in the human capital space has matured. Accordingly, USAASC's Army DACM Office has refined the AAW HCSP to more intentionally align with Army policy, specifically the Army People Strategy and its Civilian Implementation Plan.

To preserve and grow readiness in the AAW, and as part of the Army's wider readiness building effort, a human capital strategy is imperative. Moreover, the contemporary global security environment



VIRTUAL TRAINING

U.S. Cyber Command employed a new virtual training platform, the Persistent Cyber Training Environment, during the Cyber Flag 20-2 exercise. During two weeks in June, Cyber Flag 20-2 hosted more than 500 personnel worldwide, spanning nine different time zones and 17 cyber teams. (Photo by U.S. Navy Chief Mass Communication Specialist Jon Dasbach)

necessitates an acquisition human capital strategy that is oriented to build a ready, professional, diverse and integrated AAW. This plan is a reflection of our commitment to the AAW to develop the next generation of leaders and advance the Army acquisition profession. The updated AAW HCSP was published in October 2020.

In November 2020, the inaugural Acquisition Leader Assessment Program (ALAP) was held at Fort Knox, Kentucky. ALAP is the acquisition version of the Army's Command Assessment Program (Battalion Commander Assessment Program and the Colonels' Command Assessment Program), which is designed specifically for acquisition command-selection list candidates. ALAP is an assessment-driven effort to add data points to the traditional command-selection list program.

While ALAP is currently for military officers only, the goal is for civilian CSL candidates to participate in future programs.

The Army Acquisition Corps Training With Industry (TWI) program is a one-year fellowship designed to expose officers to corporate culture, best business practices and corporate decision-making processes. In fiscal year 2020, the program nearly tripled in size, going from 11 participating companies to 30. This expansion effort focused on pursuing partnerships with companies that support Army modernization priorities from multiple industries and ranging in size from small businesses to large corporations.

The Naval Postgraduate School 815 Program was established in the 2020 fiscal year for 51C noncommissioned officers (NCOs) using the Advanced Civil Schooling program. The 51C Proponent recognized the need for an advanced education opportunity for NCOs in the 51C career field. The NPS 815 program will allow 51C NCOs to obtain a graduate degree in Acquisition and Contract Management while simultaneously training to the Level III Defense Acquisition Workforce Improvement Act standards in contracting.

CONCLUSION

The Army is replete with dedicated, talented people. It is my hope that I have provided, and will continue to provide, the senior leadership guidance, encouragement and reassurance that allows our team to be innovative, understand and accept responsibility, and reduce a risk-averse culture. In doing so, the ultimate beneficiary of our success is the Soldier.

In closing, let me repeat something I have said often. Many of us in ASA(ALT) serve in uniform. Many of us in ASA(ALT) serve in civilian clothes. All of us clearly see service to this nation as a calling, demonstrating it through unwavering accomplishment of our duty despite even personal risk.

Thank you for your dedication, patriotism and example of selfless service. I am proud and honored to serve with you.

Happy New Year! Please take care of yourself and your loved ones.

DECONTAMINATION COMPLETE

The 436th Airlift Wing and the 436th Maintenance Wing complete testing of the Joint Biological Agent Decontamination System (JBADS) Lite on an in-operation C-17. (U.S. Air Force photo by Roland Balik, 436th Airlift Wing Public Affairs)





WHEN 'IT'S WHEN'

JPEO-CBRND aims its capabilities, medical countermeasures, expertise and acquisition acumen at COVID-19.

by Steven Lusher and Rachel Porto

Those in the chemical, biological, radiological and nuclear (CBRN) community follow the threat mantra, "It's not if; it's when." The rapid global spread of COVID-19 was unprecedented, and the ultimate impact remains unknown. However, the prospect of such an event occurring was not unexpected. History has shown that, whether the threat is natural or manufactured, the best can be done is just to prepare for its eventuality.

The mission of DOD's Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND) focuses on protecting the warfighter from America's adversaries. Its CBRN defense capabilities, medical countermeasures, expertise and acquisition acumen proved vital in accelerating efforts for the U.S. government's response to the pandemic.

Since 1994, JPEO-CBRND has led the nation's development of CBRN defense equipment and medical countermeasures to protect the joint force. Working with interagency and industry partners, JPEO-CBRND has developed capabilities for national and international defense initiatives, providing solutions to challenges ranging from support after the Sept. 11, 2001, attacks, to efficient neutralization of 600 metric tons of deadly chemical warfare agents from Syria in 2014. These experiences helped build JPEO-CBRND's reputation as DOD's advanced developer for delivering and fielding CBRN defense equipment and medical countermeasures.

Shortly after COVID-19 became a known global threat, the Operation Warp Speed, an interagency initiative that includes the U.S. Department of Health and Human Services, collaborated with DOD to support development and acquisition of vaccines, diagnostics and therapeutics. This partnership would leverage the CBRN defense and acquisition expertise of the JPEO-CBRND and its existing relationships to find immediate solutions for DOD and the nation. JPEO-CBRND was perfectly positioned to serve as a liaison among the interagency, industry and academic partners, and was central to enabling and managing the largest contract awards in its history at a record-breaking pace.

"By leveraging existing acquisition strategies and equipment, the JPEO-CBRND has helped Operation Warp Speed pave the way for many COVID-19 defense strategies," said Dr. Jason Roos, deputy joint program executive officer for CBRND. "JPEO-CBRND's contributions to the fight against the COVID-19 pandemic have been extraordinary and innovative, and I'm incredibly proud of our team's tireless hard work in support of Operation Warp Speed."

Led by the Department of Health and Human Services, Operation Warp Speed had an ambitious goal—to deliver 300 million doses of vaccine by the beginning of 2021. It would require multiple companies racing to find a viable solution to enter through the proper clinical trials for safe and effective use. The operation enlisted experts and support from JPEO-CBRND in the field of vaccine development, biological threats, regulatory matters and acquisition.

In addition to providing support to Operation Warp Speed, JPEO-CBRND worked with the Defense Health Agency (DHA) on DOD support efforts that included the purchase of COVID-19 diagnostic systems and assays, personal protective equipment and medical test equipment as well as conducting therapeutic research.



SUPERVISING PROGRESS
Col. Matthew Jones, 436th Airlift Wing commander, and other senior wing leadership stopped by for a short briefing as the aircraft and equipment was going through testing. (U.S. Air Force photo by Roland Balik, 436th Airlift Wing Public Affairs)

JPEO-CBRND worked with U.S. Army Contracting Command to address Operation Warp Speed and DOD requirements using a combination of Federal Acquisition Regulation (FAR) and non-FAR-based contracts. Together, they executed contract actions quickly and obligated funds within weeks instead of months, while JPEO-CBRND provided total program management, medical and biological expertise, and acquisition support to get the best value for the taxpayer. Within six months, JPEO-CBRND facilitated and managed contract procurements of up to $10.8 billion for Operation Warp Speed, $1 billion in support of DHA, and more than $455 million for DOD. JPEO-CBRND managed the award of these contracts, which were funded with Health and Human Services' Biomedical Advanced Research and Development Authority and DHA dollars, and mitigated risk by using an existing other-transaction authority mechanism to compress contract negotiations from weeks or months down to days.

This efficiency enabled Operation Warp Speed to accelerate delivery of protective and test equipment and to leverage existing scientific research to enter Phase I clinical trials for vaccine development. Long before the COVID-19 pandemic, JPEO-CBRND used this same other-transaction authority, which allows rapid and direct pre-award negotiations with

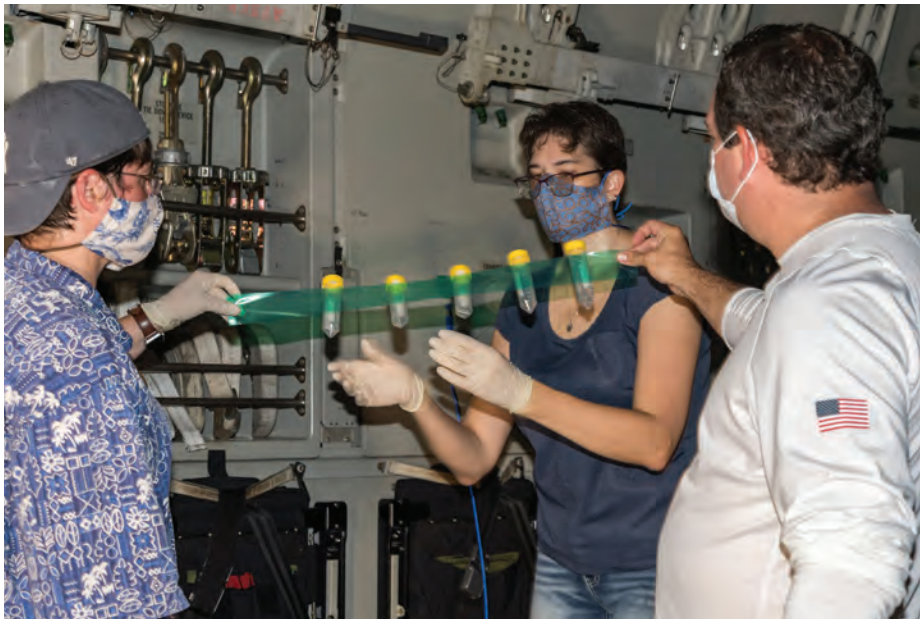
industry, to partner with innovative and nontraditional companies. As a result, JPEO-CBRND was able to draw on years of in-depth experience with other-transaction authority negotiations and awards in order to accelerate contract actions for COVID-19 efforts without compromising integrity or accountability.

"The DOD has specific skills, authorities and experience to work these types of quick-turn actions," said George Sfakianoudis, JPEO-CBRND chief financial officer. "In order to apply the DOD's abilities to support Operation Warp Speed, DHA and others, a thorough review of the contractual and financial systems and processes was done before we executed the first penny against these efforts."

EXISTING CAPABILITIES

One of JPEO-CBRND's primary customers is the National Guard Bureau. As the nation's first line of defense, the National Guard's weapons of mass destruction civil support teams assist state and local authorities responding to domestic CBRN incidents. The teams are in every state, on standby 24/7 throughout the year. As COVID-19 grew into a global pandemic and the number of infected people increased in the United States, those teams were on the front lines, providing testing capabilities to some of the nation's hardest-hit areas.

Much-needed personal protective equipment and diagnostic testing became priorities for first responders in the hardest-hit areas. JPEO-CBRND worked with the Defense Health Agency to expedite the procurement of masks, face shields and gowns, and accelerate the fielding of COVID-19 diagnostic systems. In the 2020 fiscal year, JPEO-CBRND delivered more than 58 million items and has procured more than 1 billion items in total. JPEO-CBRND accelerated fielding of DOD's Next Generation Diagnostic System, known commercially as the BioFire FilmArray, to the joint force and the National Guard Bureau. Because of the need to expand testing quickly, and the understanding that no single system or company could meet the overwhelming demand, JPEO-CBRND also leveraged the Medical CBRN Defense Consortium Other Transition Authority to work with Cepheid Inc. to develop a testing platform that could provide clinical diagnostic test results within 45 minutes, compared with several hours.



PRECISE PREPARATION

Erica Borgers-Klonkowski, left, Alice Young, center, and Brant Lagoon prepare conical tubes for testing of the Joint Biological Aircraft Decontamination System Lite on a C-17A Globemaster III. The tubes contained Phi6, a biosafety level 1 bacteriophage. (U.S. Air Force photo by Roland Balik, 436th Airlift Wing Public Affairs)

The systems that were either put into place, or were already being implemented at JPEO-CBRND to enable rapid response to CBRN threats, were used heavily to support the government's COVID-19 response. These included antibody production, DNA plasmid support and development, access to rapidly discovered monoclonal antibody candidates, and assessment of whether monoclonal antibody candidates were stable and able to be manufactured.

"We leveraged our existing relationships and formed new partnerships, which are critical to our ability to meet our day-to-day mission, to move our COVID-19 support efforts forward as fast as possible," said Chuck Nuce, JPEO-CBRND chief of operations and international.

The largest of these existing relationships and partnerships is DOD Advanced Development and Manufacturing, a contractor-owned, contractor-operated facility located in Alachua, Florida, designed to develop and manufacture medical countermeasures for the warfighter. The state-of-the-art equipment

designed for agile and flexible manufacturing reduces the time and cost of product development.

One of the many reasons for establishing the facility was to ensure that DOD has priority access to a domestic manufacturing capability during crises such as chemical or biological events and emerging infectious disease outbreaks. JPEO-CBRND used the manufacturing technologies inherent to the advanced facility to rapidly manufacture multiple vaccines and antibody candidates for clinical trials and deployment to DOD personnel. Development of the products was in partnership with the National Institutes of Health and the Defense Advanced Research Projects Agency's Pandemic Prevention Platform teams, which were instrumental in discovering antibodies, screening and choosing lead candidates to transition to the facility for manufacturing to support Phase I and II clinical trials.

Throughout these COVID-19 support efforts, a One Network of Excellence for Regulatory Affairs and Quality Assurance team, a group of regulatory and quality assurance experts, provided expertise for rapid development and deployment of the test capabilities, vaccines and therapeutics. The support of this team was needed to ensure the active management of critical quality parameters during the development process and that development addressed U.S. Food and Drug Administration requirements, lessening the risk of failure.

To strengthen its support for the national COVID-19 response, DOD also drew on the capabilities of the Global Biosurveillance Portal—a web-based data-visualization and decision-support tool established in 2014 for the U.S. Special Operations Command—as well as DOD and other agencies' personnel to build situational awareness of the coronavirus. The addition of both the Johns Hopkins University and World Health Organization COVID-19 visualization tools provided real-time, up-to-date information to decision-makers, tactical users and action officers. The Global Biosurveillance Portal continues to add users to provide a whole-of-DOD, whole-of-government approach to the pandemic.

THE WAY AHEAD

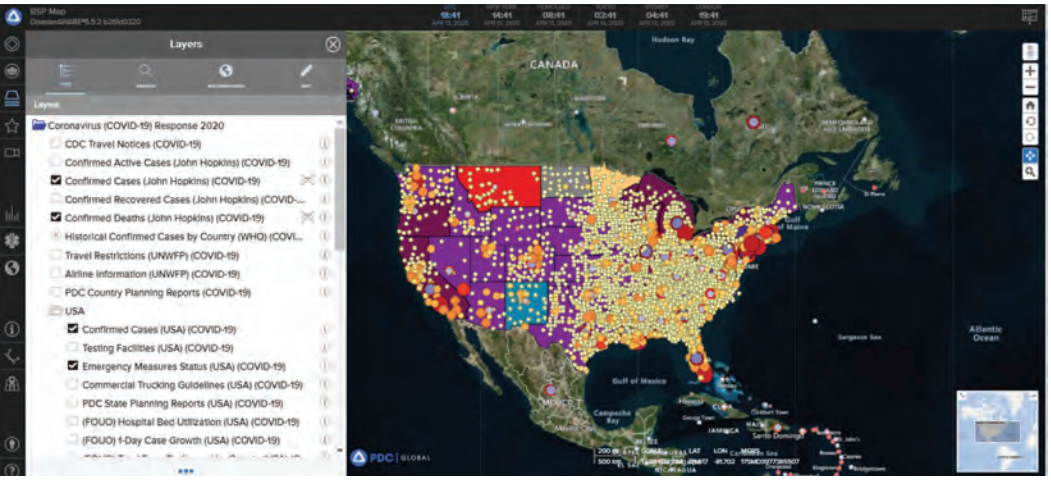
Developing capabilities that mitigate the impact of current and emerging threats continues to be the primary mission for JPEO-CBRND, even while supporting ongoing COVID-19 efforts. The urgency of the pandemic response required JPEO-CBRND to simultaneously meet that day-to-day mission while working at a record-breaking pace to execute billions of dollars across dozens



GROWING CULTURE
A lab technician works on a machine used for cell culture growth at DOD's Advanced Development and Manufacturing Facility in Alachua, Florida. (Photo courtesy of Ology Bioservices Inc.)



GETTING TESTED
Soldiers are tested for COVID-19 on July 28 prior to mobilization for training on Camp Ripley, Minn. (Photo courtesy of JPEO-CBRND)



ALL-SEEING EYE

A snapshot of the Global Biosurveilliance Portal, a web-based data-visualization and decision-support tool helps personnel to build situational awareness of the coronavirus. (Photo courtesy of JPEO-CBRND)

of contract actions in a matter of weeks to facilitate the nation's rapid response.

"What we have accomplished in six months is incredible, and is the result of our talented, dedicated and unwavering workforce," said Douglas Bryce, the joint program executive officer for CBRND. "We continue to fight this battle against COVID-19 and will use the lessons we've learned to further develop and procure the best chemical, biological, radiological and nuclear defense equipment for the warfighter."

While the next CBRN threat is unknown, one thing is certain: The national response, regardless of whether the threat's origin is natural or nefarious, is largely the same and the systems, platforms, processes and expertise already in place to support JPEO-CBRND's mission can greatly enhance urgent national efforts if called upon for support, just as they were leveraged extensively to accelerate the nation's COVID-19 response. Equally important were the strong, well-established interagency and industry partnerships that JPEO-CBRND leaned on to facilitate swift and wide-ranging collaboration and open communication across organizational lines. These relationships, and the contributions they made possible to the full spectrum of the COVID-19 response, will have lasting benefits for the future of CBRN defense for both DOD and the nation.

The nation's ability to quickly and successfully respond to future CBRN threats, regardless of their origin or intention, requires a thoughtful and critical analysis of the lessons learned from responding to COVID-19. These lessons must inform the development and acquisition of future defense capabilities against these threats. It should also ensure the invaluable relationships developed and strengthened by this crisis are maintained and codified for if and when the next event occurs.

For more information about JPEO-CBRND's COVID-19 response, go to ***https://www.jpeocbrnd.osd.mil/coronavirus*** *or follow JPEO-CBRND on social media at @JPEOCBRND, or contact* ***usarmy.apg.dod-jpeo-cbrnd.mbx.jpeo-cbd-public-affairs-office@mail.mil****.*

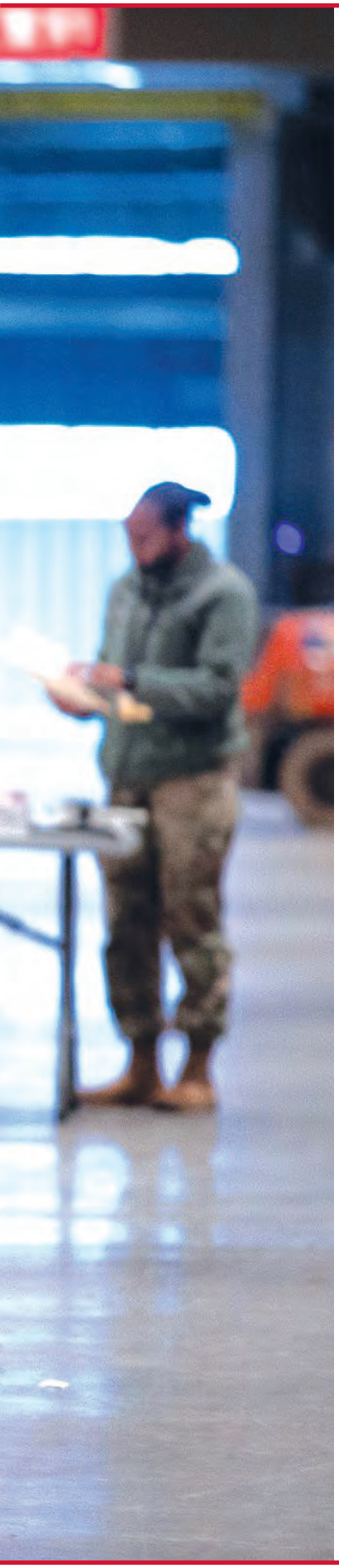
STEVEN LUSHER is the public affairs officer, deputy strategic communications and Freedom of Information Act officer for JPEO-CBRND. He has served on a developmental assignment at the Pentagon for the assistant secretary of the Army for acquisition, logistics and technology and is currently serving on a developmental assignment with the Program Executive Office for Simulation, Training and Instrumentation. Before his position at the JPEO-CBRND, he was a graphic designer for Camber Corp. and served in the U.S. Army as a multimedia specialist supporting the Army Operations Center and the chief of staff of the Army. He has an MBA in marketing and strategic communications from the University of Phoenix, graduated from the Defense Information School for Public Affairs, and is Level II certified in program management.

RACHEL PORTO is a contractor with Kalman and Company Inc. supporting the JPEO-CBRND Strategic Communications Office. Before working with the JPEO-CBRND, she supported various defense efforts as a technical writer and editor. Porto holds an M.S. in professional writing with an emphasis in journalism from Towson University and a B.A. in psychology from the University of Maryland, Baltimore County.



SUPPLY CHAIN IN MOTION

U.S. Navy Logistics Specialist 1st Class Emmeline Manaois moves medical supplies to be counted and distributed within Javits New York Medical Station on April 11 in support of the DOD COVID-19 response. U.S. Northern Command, through U.S. Army North, is providing military support to the Federal Emergency Management Agency to help communities in need. (Photo by Pvt. 1st Class Nathaniel Gayle, Defense Department Support to FEMA COVID-19)



QUICK PIVOT

DEVCOM shifts resources to keep Soldiers safe and help eliminate spread of coronavirus.

by Argie Sarantinos

The world moved into full alert as information on COVID-19 flooded the news, social media and every form of communication. Where do I get the right mask to wear? Do I need to sanitize my groceries when I bring them home? Is it safe to order food from local restaurants?

While the world reeled from the news, the Army moved into high gear to protect its greatest strength—Soldiers. To support the effort, Maj. Gen. John George, the U.S. Army Combat Capabilities Development Command (DEVCOM) commander, reached out to his team of nearly 10,000 scientists and engineers who develop solutions to keep Soldiers safe on the battlefield—asking them to pivot to respond to the coronavirus pandemic.

DEVCOM's contributions to the COVID-19 fight reflected both the expertise and the dedication of its workforce. The contributions ranged from researching antibodies to producing face coverings for Soldiers, and from training dogs to detect the virus to screening Soldiers before training rotations. Several of DEVCOM's eight centers and laboratories responded immediately by sending items they already had on hand, including personal protection equipment, to front-line organizations in need, while other teams tapped into their extensive network of government, industry, academic and international partners to develop innovative solutions to help the Army deal with the pandemic.

LUNG-ON-A-CHIP

The DEVCOM Chemical Biological Center (CBC) team knew that understanding the impact on lung tissue was important to understanding the virus. The center, which specializes in chemical and biological threats, used its Biological Safety Level 3 laboratories to study how the coronavirus affects living tissue by introducing the virus to lung tissue contained in a clear plastic container the size of a computer thumb drive. For those unfamiliar with biological safety levels, they range from one to four and are based on the agent or organisms that are studied. Biological Safety Level 4 requires the highest level of containment.

The goal of the lung-on-a-chip is to identify which specific proteins in lung cells act as receptors for the virus and its routes of entry. The chip has a top layer of lung tissue that recreates air moving along it and a bottom layer that mimics blood flow delivering micronutrients inside the tissue. The cassette's flexible plastic walls mimic the breathing process in lung cells to make the microenvironment as realistic as possible.

The lung-on-a-chip enabled the team to determine the exact infectious dose and to time the cascade of effects inside the lung tissue when that threshold was met. This information is the first step toward creating therapeutic and protective measures, and ultimately helping to develop preventative medications. DEVCOM CBC received fiscal year 2020 Coronavirus Aid, Relief and Economic Security (CARES) Act funding through the Defense Threat Reduction Agency for $4 million over 15 months for research on this project.

"Although nobody specifically knew that COVID-19 would occur, we at DEVCOM CBC were researching and preparing for the possibility of some kind of biological threat or pandemic event," said Dr. Eric L. Moore, director of DEVCOM CBC. "Our researchers are the science and technology experts on biological threat protection, detection and decontamination. We also possess world-class additive manufacturing expertise. This combination made us well poised to support the nation in the fight against COVID-19, from material evaluation to personal protective equipment and even supply chain support. We were able to jump in and support our various partners with this emergency while continuing to accomplish our mission of developing technologies to protect the warfighter against chemical and biological threats on the battlefield."

"Getting our Soldiers the best equipment is a team sport, and we used all our resources here."



FIT FOR DUTY
Staff Sgt. Christian King-Lincoln, a noncommissioned officer with DEVCOM Soldier Center's Headquarters, Research and Development Detachment, adjusts a shapeable nose bridge as he tries on an early prototype of the Army face covering. (Photo by David Kamm, U.S. Army DEVCOM Soldier Center)

TEAMING WITH MAN'S BEST FRIEND

Dogs have been trained to detect ovarian cancer and diabetes in the past, which inspired the DEVCOM CBC to consider the possibility that dogs could detect coronavirus as well. DEVCOM CBC teamed with the University of Pennsylvania, through a cooperative research and development agreement, to determine if dogs could detect proteins the human immune system generates to fight the coronavirus.

DEVCOM CBC researchers developed the Training Aid Delivery Device, known as TADD, which are containers that are safely sealed with a membrane that prevents hazardous material from escaping, but allows the scent of those materials to pass through. The TADDs are attached to arms on a wheel; as a dog moves around the wheel, it learns to detect substances in the TADDs. In this case, the items in the TADDs are not live COVID-19 virus, but rather samples of urine, saliva, sweat and other biological samples that contain the biomarker proteins associated with COVID-19 disease in humans.

The proof-of-concept study showed that dogs can be trained to detect the virus with 96 percent accuracy. Training the dogs to detect substances takes from six to nine weeks, though some dogs do not complete training because of its intensity.

The next step in the project, which is not yet funded, is to train the dogs to work in public spaces such as airports and sports stadiums, where their ability to detect asymptomatic carriers could help prevent further transmission.

MEASURING COVID-19 ANTIBODIES

In August, the U.S. Food and Drug Administration (FDA) issued an emergency use authorization to use convalescent plasma to treat people infected



ADVANCES IN SCIENCE
Dan Angelini, Ph.D., a DEVCOM Chemical Biological Center research biologist, loads the Emulate lung chip into its medium supply system known as a "Pod." (Photo by Jack Bunja, U.S. Army DEVCOM)

with the coronavirus. According to the FDA website, such authority allows the FDA to help strengthen the nation's public health protections against chemical, biological, radiological and nuclear threats by facilitating the availability and use of medical-countermeasure initiatives needed during public health emergencies. At the time and in response to the authorization, more than 70,000 American patients who had recovered from the coronavirus donated plasma to help people who were sick with the coronavirus.

Researchers at the DEVCOM Army Research Laboratory (ARL) teamed with the U.S. Army Medical Research Institute of Infectious Diseases, Houston Methodist Medical, Penn State University and the University of Texas at Austin to test ways to measure COVID-19 antibody levels for convalescent plasma therapy. The researchers found that the enzyme-linked immunosorbent assay (ELISA) test has an 80 percent or more probability of determining comparable antibody levels at or above the FDA-recommended levels necessary for COVID-19 convalescent plasma. The team also concluded that convalescent plasma donors maintain high levels of immunity for many weeks; frequent plasma donations do not cause a significant decrease in antibody or virus neutralization levels. Twenty-seven asymptomatic individuals who were part of the surveillance cohort with high enough antibodies indicated that some asymptomatic individuals may have plasma suitable for therapeutic use, and may have a degree of relative immunity against the coronavirus. Researchers also determined that the optimal window for donating convalescent plasma for COVID-19 immunotherapy is within the first 60 days after the donor has symptoms.

"I'm so proud of our DEVCOM team and all our partners. For ARL, as the Army's corporate research lab, we build forward-looking, strong partnerships across the foundational research ecosystem and across scientific disciplines," said Dr. Patrick J. Baker, ARL director. "This creates a scientific agility and responsiveness that both prepares the Army for the future and allows us to pivot when needed to tackle new unknowns. Our ARL



THE SNIFF TEST

COVID-19 detection canine Poncho indicates a positive sample from multiple items presented on a canine training wheel. The Training Aid Delivery Devices attached to each arm of the wheel allow the dog to detect the substance inside, some of which are the proteins that a person produces in response to the virus. (Photo by Jack Bunja, U.S. Army DEVCOM Chemical Biological Center)

response to COVID-19 with our partners is an excellent example of pivoting against a previously unknown threat. You know, at our core in DEVCOM, whether it's one of the seven centers or us in ARL, in the end, our people are driven to use their expertise and to partner to help those on the front lines, whether they are our Soldiers, or in this case, COVID-19 patients and health care workers."

TRACKING TO REDUCE EXPOSURE

DEVCOM CBC and the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND) found a way to screen nearly 4,000 Soldiers for COVID-19 before training rotations at the National Training Center at Fort Irwin, California. The center shipped two JPEO-CBRND mobile laboratories to Camp Ripley Training Center, Minnesota, where the Soldiers were located. The Soldiers were part of the 1st Armored Brigade Combat Team, 34th Infantry Division, Minnesota National Guard. In addition to shipping the mobile laboratories from Aberdeen Proving Ground, Maryland, to Camp Ripley, they had to be outfitted with analytical equipment to screen the Soldiers. Members of the CBC Chemical Biological Application and Risk Reduction team transported the mobile laboratories to Minnesota. On the first day of screening, 117 Soldiers were tested. After a brief pause, nearly 1,000 Soldiers were tested each day.

DEVCOM ARL tapped into its vast network of academic partners to work with the University of Pittsburgh Medical Center to create a biocontainment unit to reduce the transmission of the coronavirus for medical personnel caring for COVID-19 patients. The team designed an individual biocontainment unit that uses negative pressure to suction the air around a patient and filter out viral particles. Because the air is actively filtered out, the individual biocontainment unit helps to reduce the spread of the virus, particularly when a patient is being intubated.

EQUIPPING SOLDIERS

While the country struggled with what type of face coverings were needed, whether they would provide enough protection and how to properly wear them, people around the country became creative, donning everything from bandanas to scarves to homemade coverings. Ordering and receiving masks online during the onset of the pandemic was difficult because demand far exceeded supply.

DEVCOM Soldier Center, which develops textiles and uniforms for Soldiers, responded by designing, and later building and testing, a prototype for a durable face covering for Soldiers in non-medical, public settings. This effort continued for several weeks and eventually produced more than 12,000 face coverings for Soldiers. The face coverings, which were produced at the Soldier Center, were sent to Soldiers at Fort Benning, Georgia, allowing them to continue training. The coverings were also distributed to the Natick Soldier Systems Center workforce, enabling them to return safely back to the workplace. DEVCOM Soldier Center also developed two videos, which were posted to YouTube, showing how to properly wear the face covering. The team also created a technical data package, which is located on the Soldier Center website, with patterns and information on how to produce large quantities of the face covering.



A CLEAR SUCCESS

Researchers from DEVCOM's Army Research Laboratory and University of Pittsburgh Medical Center tested their individual biocontainment unit during a simulated isolation test designed to contain virus-sized particles from a simulated COVID-19 patient. (Photo by Army Research Laboratory)

Researchers found that the ELISA test has an 80 percent or more probability of determining comparable antibody levels at or above the FDA-recommended levels necessary for COVID-19 convalescent plasma.

"Getting our Soldiers the best equipment is a team sport, and we used all our resources here," said Doug Tamilio, director of the Soldier Center. "A talented team of our employees, Soldiers from the parachute rigger section and NCOs [noncommissioned officers] and human research volunteers from our Headquarters Research and Development Detachment, all worked together to rapidly make the initial prototypes and then make minor design improvements based on feedback from the Soldiers."

DEVCOM's contribution to mask production didn't end there. A new partnership among the Army Research Office at Research Triangle Park, North Carolina, North Carolina State University and the 82nd Airborne Division Innovations Council at Fort Bragg, North Carolina, provided more than 100,000 face masks for Soldiers. Researchers at North Carolina State University's Nonwovens Institute developed a unique filtration material that effectively filters out viruses and bacteria. The university donated 4,725 meters of the newly developed filtration material to the XVIII Airborne Corps at Fort Bragg. Paratroopers in the 82nd Airborne Division, which is part of the XVIII Airborne Corps, specialize in parachute missions, so the parachute riggers already had the skill set, equipment and facilities to sew the masks.

As the coronavirus spread throughout the country, several areas became hot spots, including New York City. In response to New York's urgent need for protective equipment, DEVCOM Soldier Center delivered equipment, including N95 respirators, surgical-grade face masks, nitrile gloves, disposable lab coats, Tyvek suits and safety goggles and glasses to the Army's 44th Medical Brigade, which deployed to the nation's hardest-hit city to support COVID-19 response efforts.

CONCLUSION

While DEVCOM continues to focus on its primary mission to support Army modernization priorities and drive scientific discovery to provide Soldiers with the best technology available, the command is also committed to helping the Army and the world during the coronavirus pandemic. DEVCOM's highly skilled workforce, along with its extensive network of partners, developed innovative solutions that will protect not only Soldiers, but people all around the world.

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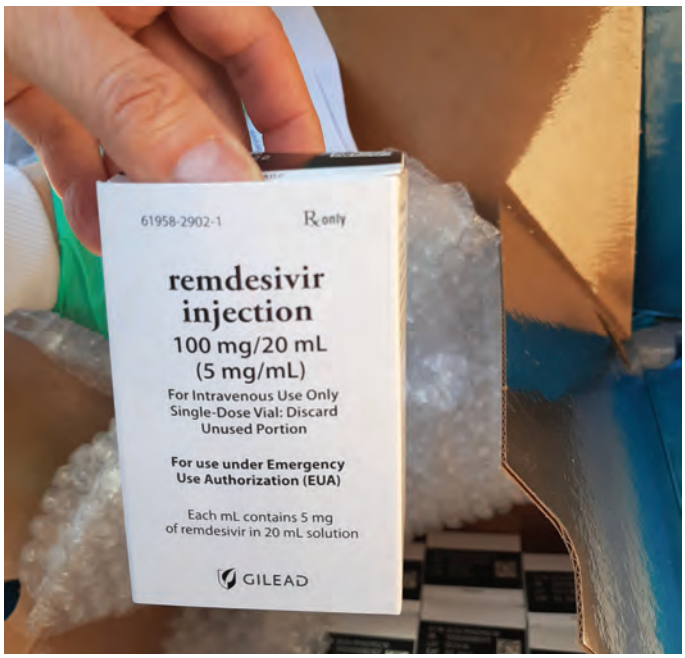
COMPLEX MISSION, CLEAR RESULTS

USAMRDC tackles coronavirus treatment with tools designed for flexibility and speed.

by Ramin A. Khalili



READY FOR ITS CLOSEUP
A shipment of vials of remdesivir intended for clinical trial use. Gilead Sciences invested millions of dollars of independent research and development funding to develop the drug, which, until COVID-19, seemed to have a very small but promising market in helping treat Ebola virus disease. (Photo courtesy of Lt. Col. Sandi K. Parriott)

Even in extraordinary times, it's still business as usual in the halls of the U.S. Army Medical Research and Development Command (USAMRDC). While the vast majority of Soldiers and staffers across the command have by now added a substantial dose of telework to their weekly routines in the wake of the novel coronavirus pandemic, the staffers with the Force Health Protection (FHP) team at the USAMRDC's U.S. Army Medical Materiel Development Activity (USAMMDA) are still reporting to post daily, still fielding calls using the same office phones. Given that they stand at the very fore of the USAMRDC's distribution of remdesivir—an investigational drug currently being provided to DOD personnel exposed to COVID-19—the daily workload takes special precedence.

"For as hard work as it's been, it has been quite rewarding," said Lt. Col. Sandi Parriott, FHP director. "We feel like we're on the front lines."

In many ways, and certainly from USAMRDC's viewpoint, the front lines are everywhere in the fight against COVID-19. In remdesivir—a broad-spectrum antiviral treatment developed by corporate partner Gilead Sciences Inc.—there is hope that DOD soon may be able to provide a tool to help curb coronavirus infection for good. The military, based on initial data suggesting remdesivir may indeed be effective against the virus, has been studying the drug for this medical indication since early March.

How interesting then, that for all the capital, human and otherwise, invested in remdesivir, the story behind its acquisition reveals not only the importance of USAMRDC's various scientific and legal processes, but also highlights the relationship between all the many functioning organizations surrounding—and connected to—USAMRDC.

COLLABORATIVE PARTNERS

"Working together in this space is imperative," said Mark Hickman, a senior scientist with the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND). "No one organization can possibly tackle the complexities of this mission alone."

As a frequent collaborator with USAMRDC, JPEO CBRND's Joint Project Manager for Chemical, Biological, Radiological, and Nuclear Medical (JPM CBRN Medical) is the perfect place to start when telling the story of remdesivir. Located at Fort Detrick, Maryland, JPM CBRN Medical staff enjoys a close relationship with many of USAMRDC'S internal organizations, notably USAMRDC's U.S. Army Institute for Infectious Diseases (USAMRIID) and Walter Reed Army Institute of Research. Tasked with facilitating the advanced development and acquisition of medical countermeasures, the overall mission of the JPM CBRN Medical team is to provide the U.S. military with safe and innovative medical solutions to counter chemical, biological, radiological and nuclear threats. It is by leveraging the organization's many relationships across private industry that brought remdesivir to the table in the first place.

According to Hickman, initial research on remdesivir began back in 2009, as it was initially developed and tested to help fight Ebola virus disease—a purpose for which, notably, it was deemed reasonably effective, according to JPM CBRN Medical leadership. Regardless, given the drug's efficacious track record against other types of coronaviruses over the years, its application to COVID-19 was, in the words of leadership, an obvious avenue to pursue.

Hickman added that, during in vitro studies on coronaviruses isolated from bats and human lung cells, remdesivir displayed "significant" activity. Additionally, during in vivo rodent studies

"From cooperative agreement to first patient treatment was 21 days. That's very fast. It's definitely a record."



EMERGENCY USE
Remdesivir, pulled from its shipment package, bears the notice of the emergency use authorization printed in bold type halfway down the label. (Photo courtesy of Lt. Col. Sandi K. Parriott)

of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, the virus that causes COVID-19), the early therapeutic administration of remdesivir significantly reduced lung viral load, improved clinical signs and enhanced respiratory function.

Once those facts were available, it was just a matter of picking up the phone. For JPM CBRN Medical, it was only natural to call USAMMDA.

"They happened to mention to us that [remdesivir] had some value with coronaviruses," said Parriott, noting Force Health Protection's "consistently productive" collaborative efforts with the team at JPM CBRN Medical, led by Lt. Col. Chuck DiTusa and Rachel Overman. "This effort with remdesivir has highlighted how well DOD organizations can work together."

As a result, the two groups launched an effort with Gilead to create an expanded access program to provide infected Soldiers access to remdesivir (an effort aligned with Force Health Protection's operational mission to provide investigational drugs for emergency use to the warfighter in response to a high-consequence threat). That effort—allowed under a dedicated expanded access protocol that's been in place since March—specifically permits the investigational use of remdesivir for active-duty personnel diagnosed with moderate-to-severe novel coronavirus infection (with all doses provided by Gilead at no cost to the government). Additionally,

and in this same vein, an emergency use authorization, approved by the U.S. Food and Drug Administration (FDA) in June, made remdesivir available to both military members and the greater American public. Under the authorization, Gilead donated 500,000 doses of the treatment to the federal government to be distributed, ultimately, to hospitals for the purposes of dissemination to the American public either completely free of charge or at a reduced price.

"If you have or are diagnosed with severe COVID at a civilian hospital, it is available through the EUA [emergency use authorization]," said Parriott, who additionally handles the distribution, tracking and storage of the treatment allocated to the DOD under the emergency use authorization effort.

MANY MOVING PARTS

Backing up for a second, it's important to note that switching from one area of study to another doesn't just happen immediately, or without substantial behind-the-scenes effort. In other words, USAMRDC efforts such as these simply can't (and don't) turn on a dime. In this specific case, the shift from using remdesivir as a potential Ebola medical countermeasure to its current use as a COVID-19 treatment—as well as the aforementioned expanded access protocol and emergency use authorization rulings—was the product of a process that required a unique and powerful set of legal and regulatory tools.

Indeed, for Jeremiah Kelly, who serves as chief of the FDA Regulatory Law Division, Office of the Staff Judge Advocate at USAMRDC, the process to create so-called "win-win" medical product development collaborations is similar in design to a well-choreographed dance routine.

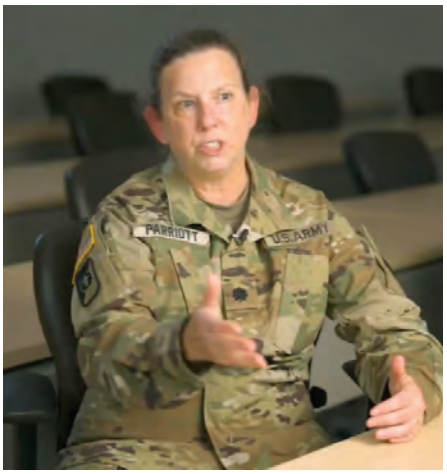
"Each one of these collaborations with our industry partners is unique, and each one is going to require a different set of legal solutions," said Kelly. "And even within those legal solutions, it's almost like a radio where you have to dial into the right station—the text that governs our relationship has to reflect the equities and goals of the partners. There is no one-size-fits all model."

DANCE OF THE CRADA

One of the tools at USAMRDC's disposal is a type of contract known as a cooperative research and development agreement (CRADA). In short, a CRADA operates as a research-and-development tool that enables federal laboratories to transfer or contribute government resources such as personnel, services and facilities to non-federal partners—with or without reimbursement, but (as a rule) with no funding from the organization to the partner—for the purpose of conducting research or development efforts consistent with the mission of the organization. On the other side, the non-federal collaborating partner can transfer or contribute any resources to the federal organizations (including funding) toward those same research-and-development efforts.

"The moment that we heard that remdesivir had some activity against other coronaviruses, our legal team engaged with both our JPEO-CBRND and USAMMDA clients and Gilead via the CRADA mechanism to ensure that we could see the data and lay the groundwork to ensure DOD personnel would have access to this potentially effective therapy," said Kelly, noting that the flexible nature of the CRADA enables USAMRDC to "get in the game" as early as possible. "We have so many requirements and so many capability gaps in the medical countermeasure space that the CRADA allows us to dance with whomever we want," said Kelly. "The CRADA was the perfect legal tool to rapidly establish expanded access, with treatment courses guaranteed to DOD personnel across the globe, and with the ability of our FHP team to obtain more from Gilead as needed."

The CRADA is further notable in that it essentially acts as a tech-transfer authority unto itself, something put into statute as part of the Stevenson-Wydler Technology Innovation Act of 1980. "It's a very rapid non-competitive capability where we can essentially decide how we want to do it," said Kelly. "We can provide anything to a collaborator except money, which is why it's not competitive. And we can take in everything, including money to facilitate any collaboration. So the nice thing about the CRADA is it can almost take any shape, so long as the government's not paying money to that collaborator."



FRONT LINES
Lt. Col. Sandi Parriott was interviewed during a taped video presentation as part of USAMRDC's contribution to the 2020 Annual Meeting and Convention of the Association of the U.S. Army (AUSA), which was held virtually in October. (Video image courtesy USAMRDC Public Affairs)

An example of a CRADA's inherent flexibility is the 2016 Ebola CRADA and subsequent other-transaction agreement between Gilead and JPEO-CBRND. In that instance, the agreement included a CRADA whereby a substantial amount of the work was scheduled to take place at the USAMRDC's USAMRIID. According to Kelly, that's when the USAMRDC legal team stepped into the fold to ensure the various agreements were aligned and, in a turn of legal parlance, "spoke to each other."

LEGAL ELITE

"Our legal team here at USAMRDC is actually recognized well beyond the Army in terms of its capability to provide legal solutions to facilitate FDA-regulated medical product development," said Kelly. "Our expertise and the way that we staff these agreements is very unique to the federal government. Our attorneys are right there alongside our contract teams, making sure that the intellectual property, technical data-rights provisions and the FDA regulatory provisions are all aligned in such a way that the government's not only going to achieve its short term goals, but it's actually going to be structured in a way that, if the data is supporting, would result in an FDA-approved, licensed, or cleared product. We are the DOD's recognized legal experts in medical product development, including intellectual property and FDA regulatory law. We are all passionate about our mission and bringing to bear our expertise to help our clients defeat this virus."

According to Bob Charles, chief of medical-research law with USAMRDC, the command has anywhere between 800 to 900 active CRADAs at any given time, efforts that have led to more than $400 million in direct funding from collaborating partners for research-and-development efforts.



MEDICAL PRACTICE
Video image of active efforts taking place in a USAMRDC lab. The video was recorded as part of a taped video presentation on behalf of the USAMRDC's contribution to an October AUSA event. (Video image courtesy USAMRDC Public Affairs)

"I don't think there's any organization within the federal government that utilizes a tech transfer authority like the CRADA function as frequently as MRDC does," said Kelly.

Opportunities for CRADAs, Charles said, normally begin at the scientist or researcher level, and can start with something as simple as a scientist reading about promising research in a journal, or perhaps even hearing about a new technology during a conference. In other words, the CRADA process employs (and encourages) a kind of grassroots, bottom-up approach to help gather initial momentum.

"Our scientists generally have a very good handle on what's out there in the scientific community and who would be great to partner with," said Kelly on the process. "There are folks who do a ton of market research continually to see who is doing what with what molecule out there."

With regard to remdesivir, that kind of awareness (combined with the previously described close relationship between USAMMDA and JPM CBRN Medical) enabled all entities involved to move quickly. Kelly and his team began almost immediate development of a CRADA, and—operating through USAMMDA—secured 100 treatment courses of remdesivir (for military use only) through Gilead, with an option for an additional 100 later. For reference, 100 treatment courses is approximately 1,100 doses.

"The ability for us to rapidly use the CRADA authority to [process] remdesivir has saved lives," said Kelly. "And that's not hyperbole. It's literally saved lives. It would've been a real question mark as to who would take the ball and run with it if we weren't able to use our CRADA authority to rapidly partner with Gilead." Meanwhile, he added, the other-transaction authority and CRADA mechanisms established to study remdesivir for use against Ebola continues.

LIGHTNING IN LANDSTUHL

Back in the Force Health Protection office at USAMMDA, Parriott is still manning the phones—they are, after all,

available globally 24 hours a day. Despite the fact that Force Health Protection's operational mission prohibits research (it merely reports back safety and real-world outcome data to Gilead, the FDA and other interested parties), she can't help but marvel at the speed of the entire process. The CRADA with Gilead was signed the first week of March and evolved at a lightning-quick pace. According to Parriott, Gilead sent the first shipment of remdesivir on March 17, with FDA approval of the protocol coming down the same day. Force Health Protection enrolled the first military site in the protocol just three days later, on March 20 (at Landstuhl Regional Medical Center in Germany), with clinicians treating the first patient on March 26.

"From cooperative agreement to first patient treatment was 21 days," said Parriott. "That's very fast. In our immediate history, it's definitely a record."

Parriott further notes—in another nod to USAMMDA's close relationship with JPM CBRN Medical—that Force Health Protection's reputation helped drive the effort from the get-go.

"[CBRND] knew that FHP would be the quickest way to get the product out and be able to treat potential DOD members, especially [outside of the continental United States]," she said. "This shows the value of having a division like ours that can bring a product that has a lot of promise ahead of the licensure … and have value."

The results, so far at least, have been promising. Under the expanded-access protocol, FHP had treated a total of 40 patients with remdesivir as of Aug. 25, with 36 of those (or 90 percent) now considered fully recovered after completing all protocol requirements. Of those original 40, two patients were still being actively treated under the protocol.

"The ability for us to rapidly use the CRADA authority to [process] remdesivir has saved lives. That's not hyperbole. It's literally saved lives."

Still, given the entirety of these results, there can be no doubt that remdesivir holds special promise in the fight against COVID-19. So much so, in fact, that even the behind-the-scenes efforts—from the moment the antenna went up at JPM CBRN Medical to the moment USAMMDA and Gilead sat down with Jeremiah Kelly's team to hammer out a CRADA and then beyond—are scoring (virtual) high-fives from major players themselves.

"I'm not sure anyone has a full appreciation of the tremendous work that is happening all across this command," said Kelly. "We're not in the business of tooting our own horn, but it's phenomenal to see what [the command] is doing."

Parriott can't help but agree. So far, she points out, the information from the remdesivir clinical trial shows the treatment reduces hospitalization time and, also, the antiviral load of the patient, both of which have allowed for quicker recovery times. The FDA noted such ongoing clinical trial efforts in a statement handed down on October 22 announcing its approval of remdesivir as a treatment for COVID-19 in cases requiring hospitalization. For Parriott, watching an effort like this one—and from such a close vantage point, too—allows for a perspective that reaches far beyond the walls of her office and, to an extent, even beyond the reach of the command.

"This shows the value of having a command like ours that can bring a product that has a lot of promise ahead of the licensure and have value," said Parriott. "We actually feel like we're saving lives."

For more information on the emergency-use authorization by the FDA for remdesivir, go to ***https://www.fda.gov/media/137564/download****. To read the remdesivir fact sheet, go to* ***https://www.fda.gov/media/137565/download****. For more information on USAMRDC, go to* ***https://mrdc.amedd.army.mil/****. For more information on JPEO-CBRND, go to* ***https://www.jpeocbrnd.osd.mil/.***

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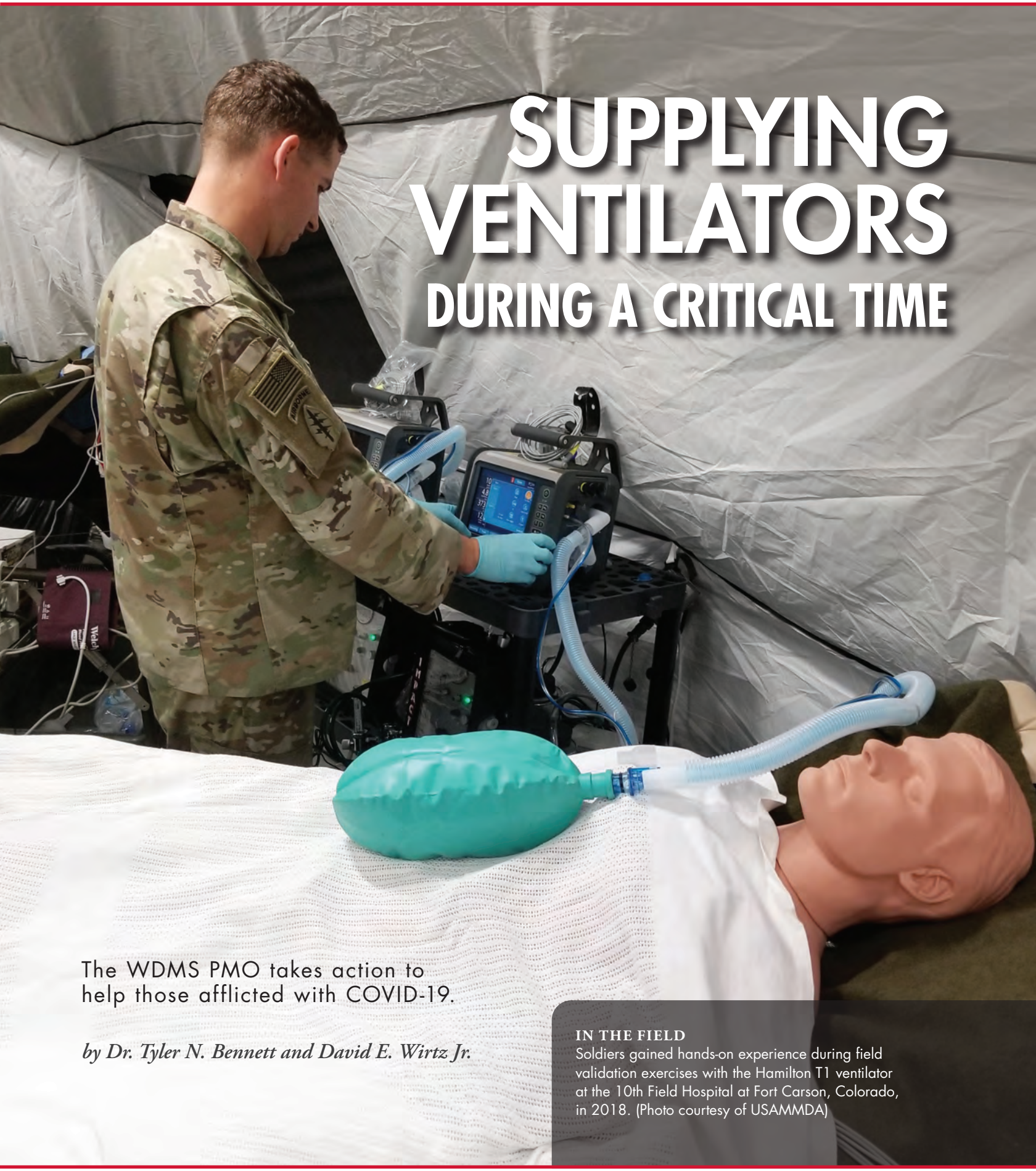
SUPPLYING VENTILATORS DURING A CRITICAL TIME

The WDMS PMO takes action to help those afflicted with COVID-19.

by Dr. Tyler N. Bennett and David E. Wirtz Jr.



IN THE FIELD
Soldiers gained hands-on experience during field validation exercises with the Hamilton T1 ventilator at the 10th Field Hospital at Fort Carson, Colorado, in 2018. (Photo courtesy of USAMMDA)

In early 2020, we learned that the potentially fatal coronavirus was quickly spreading from person to person, country to country and continent to continent. We were instructed to wear masks and stay at home for our safety and to help stop the spread of the virus. As the medical world began to assess the situation and look for answers, patients were quickly filling hospitals and clinics, with no end in sight. Necessary medical equipment was becoming scarce, and Army medical professionals immediately stepped up to help find solutions to the problems. Historically, in both war and peacetime, Army Medical Command has helped to provide immediate medical care and resources for both military and civilian patients worldwide.

Called upon to use its expertise and resources to supply ventilators to treat patients afflicted by COVID-19, the U.S. Army Medical Research and Development Command (USAMRDC) looked to one of its subordinate commands, the U.S. Army Medical Materiel Development Activity (USAMMDA), to assist in this effort. USAMMDA asked its Warfighter Deployed Medical Systems Project Management Office (WDMS PMO) team to step in and help because of our expertise in the field regarding the products we manage on a daily basis for the Army.

As the medical equipping office of the Army, our Warfighter Deployed Medical Systems Project team was instrumental in rapidly deploying these much needed ventilators, as well as infusion pumps, ultrasonic cleaners, intensive care unit sets, blood-gas analyzers, suction apparatuses, steam sterilizers and other medical supplies with very little lead time.

Aligned under the Army Futures Command, USAMMDA manages both medical product development and the modernization and sustainment of these critical products. The organization houses five project management offices, as well as its Force Health Protection Division, all of which support the mission to develop and deliver quality medical capabilities to protect, treat and sustain the health of our service members. The WDMS PMO is tasked with the procurement, fielding, sustainment and modernization of the medical sets and equipment fielded to U.S. Army personnel throughout the world. However, in response to the COVID-19 pandemic, the WDMS team has risen to the challenge of supporting our nation's civilian population as well.

A UNIQUE SKILL SET

As we now know, COVID-19 typically affects the human respiratory system, and may cause hypoxemia, or below-normal levels of oxygen in the blood. Therefore, early in the pandemic, many health care providers recommended the use of medical ventilators to treat COVID-19 patients in severe respiratory distress. However, since we were experiencing historic numbers of patients requiring ventilators, these units were just not available for everyone at that time.



SAFETY FIRST
The Hamilton T1 ventilator provides effective, safe and lung-protective ventilation for adult, pediatric and neonatal patients. (Photo courtesy of Hamilton Medical)

During the onset of COVID-19, the federal government recognized there were not enough ventilators in the U.S. strategic national stockpile to address the rapidly growing requirement. To meet the needs of the civilian medical community, the government developed a mandate that the Army be prepared to provide ventilators upon order. The WDMS team's vast experience in the rapid deployment of medical products and devices, and its expertise in ensuring these items meet or exceed the needs of users made it the ideal candidate to help.

In the early stages of the pandemic, Army hospital centers, the 531st Hospital Center from Fort Campbell, Kentucky, and the 9th Hospital Center from Fort Hood, Texas, deployed to the Javits Center in New York. Meanwhile, the 627th Hospital Center from Fort Carson, Colorado, deployed to CenturyLink Field in Seattle to aid the local community hospitals in meeting patient capacity. The Javits Center treated more than 400 patients from the civilian population with various medical needs, including those testing positive for COVID-19. In support of this effort, we

quickly provided much-needed ventilators to these locations, to aid in the treatment of patients with more severe symptoms of the disease, helping to save as many lives as possible.

DEEP BREATHS

Ventilators have a long and storied history of aiding in the care and survival of Soldiers on the battlefield, used largely in Army-deployed hospital centers and air ambulances. Ventilators help keep critically wounded service members alive until they can be transported to a higher echelon of care. However, the legacy ventilators were more than 15 years old and badly in need of replacement. As part of WDMS PMO's responsibilities, we manage the replacement and modernization of obsolete commercial off-the-shelf and legacy medical devices to ensure up-to-date, safe and effective patient care. These medical devices must endure and successfully pass rigorous testing to ensure the use and effectiveness of the device not only in well-maintained, climate-controlled hospitals, but also in the most hostile, austere and weather-driven climates. Our team recently tested the Army-fielded Hamilton T1 ventilator in environments similar to that of deployed service members and—against legacy and new ventilators currently on the market—found these units to be superior to other available products. We were able to secure the necessary funding to test, down-select and field the Hamilton T1.

We found that ventilator to be the easiest to maintain in austere environments, ensuring the Army's fleet of ventilators will be continuously ready for use anywhere around the globe. Its features include its ability to be completely independent of compressed air, reducing weight and saving space, since it does not require a gas cylinder or a compressor. This is most important when transporting patients via



CRITICAL SUPPORT

USAMMDA's Warfighter Deployed Medical Systems Project Management Office helped to supply critical ventilators during the COVID-19 pandemic. This ICU setup was used at the temporary medical treatment facility at the Javits Center in New York. (Photo by Maj. Crista Wagner, 44th Medical Brigade)



VENTILATION EDUCATION
Hamilton Medical clinical application specialist Jonathan Beene trained combat medics and clinicians on the use of the Hamilton T1 transport ventilator at Fort Bliss, Texas, in 2018. (Photo courtesy of Hamilton Medical)

ambulance to a hospital center, or from one facility to another. The Hamilton T1 also allows medical providers to adjust the oxygen concentration from 21 percent to 100 percent, depending on the needs of the patient. During the initial months of the COVID-19 pandemic, these ventilators proved to be extremely useful and necessary in many instances, and we were able to help deploy the units to those facilities in need.

ABOVE AND BEYOND

In an attempt to get ahead of the Army's mandate to provide ventilators upon order, personnel from USAMMDA's Force Sustainment Directorate traveled with a medical logistics support team to Sierra Army Depot in Herlong, California, to prepare nearly 300 Hamilton T1 ventilators for transfer to the Federal Emergency Management Agency (FEMA). Within hours, seven personnel were on a plane flying to Sierra, and once there, they quickly pulled and secured ventilators on pallets for transport. Once the units were prepared for deployment and immediate use, they were staged on the airfield to be sent out when needed.

In addition to preparing existing ventilators at Sierra Army Depot, one of the authors of this article, Dr. Tyler N. Bennett, was selected to form a team in support of FEMA and the nationwide ventilator response. During his six-week assignment, Bennett was responsible for tracking the day-to-day production of ventilators under contract with 10 different commercial vendors across the country. As part of USAMMDA's overarching effort to ensure the fulfillment of critical medical products and devices, the WDMS PMO team's research and analyses supported the national stockpile of ventilators. Based on the usage rates that the team recognized early during the crisis in New York City, per our discussions with clinical staff at New York City area hospitals, we calculated what we believed to be the minimum number of ventilators required to meet the mission.

Although we continue to battle COVID-19, the next crisis may occur at any time or any place, and Army Medicine, USAMMDA and the WDMS PMO will stand ready and be prepared to help with whatever may be needed. Our team is truly proud of our numerous efforts in support of the nationwide response to the pandemic, and we look to use our experience to help withstand any medical emergencies—whether national or global—that may arise in the future.

For more information on the WDMS PMO and other products being developed and maintained by the U.S. Army Medical Materiel Development Activity, go to the USAMMDA website at ***https://www.usammda.army.mil/.***

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INNOVATION AT MACH 5

To quicken the delivery of hypersonic capabilities, the Army had to create the industrial base for the technology. Then came COVID-19.

by Raymond D. Wesley

On Valentine's Day 2019, Lt. Gen. L. Neil Thurgood, then a major general, received an unprecedented gift: Army senior leaders gave him responsibility for the Army's hypersonic future.

Hypersonic weapons are capable of flying at five times the speed of sound and operate at varying altitudes, making them unique from other missiles with a ballistic trajectory. With Russia and China quickly developing hypersonic missiles, posing a challenge to existing defensive systems, the United States military needed to act. In accordance with the 2018 National Defense Strategy and its emphasis on great power competition, the United States significantly increased and accelerated investments in hypersonic systems of its own.

For the Army, this change would require partnering with the Navy to develop a combat-capable prototype hypersonic weapon system that would be fielded to an operational battery of Soldiers by the end of the 2023 fiscal year—two years earlier than the Army's previous plan to deliver a hypersonic missile in 2025. For Thurgood and his team, that meant executing an enormous mission delivery in just four and a half years.

Developing and fielding a new major weapon system can take many years, so this was no small task. However, shortening the timeline by two years was just the beginning of several challenges.

CHALLENGES ABOUND

Having been developed primarily by a national laboratory, the missile to be used for the Army and Navy hypersonic weapon prototypes was essentially a test asset. Known as the Common Hypersonic Glide Body (CHGB), it comprises a conventional warhead, guidance system, cabling and thermal protection shield. It uses a booster rocket motor to accelerate to well-above

hypersonic speeds, and then leaves the expended rocket booster and glides to the target. But in February 2019, experimental hypersonic glide bodies had flown just a handful of successful tests. To field an operational prototype by 2023, an aggressive schedule of joint flight tests would be required to evaluate, demonstrate and refine the hypersonic capability before delivering it to operational users. To meet this aggressive flight schedule, design and development efforts had to be able to evolve quickly.

The technology required for the Army Long Range Hypersonic Weapon had three main pieces. One piece was the CHGB: the focus of this article and a joint effort of the Army, Navy, Sandia National Laboratories, Lawrence Livermore National Laboratory and multiple industry partners. The second piece was the booster, which would also be developed jointly with industry, the Army and the Navy. The third piece was the ground support equipment (trucks, launchers and battery operations center) for an Army fires battery that would man the system, which also required industry support to modify and integrate existing and new technologies to achieve new effects.

As part of the Office of the Secretary of Defense Conventional Prompt Strike effort, the services are partnering to execute hypersonics through the use of a common glide body, missile design similarities and joint test opportunities. While the Navy will lead the design of the glide body, the Army will lead production, which includes building a new industrial base that can meet the demands of producing the glide bodies on a larger scale than the national laboratories have done in the past.

Within the Army, three separate organizations, including the Rapid Capabilities and Critical Technologies Office's (RCCTO) Army Hypersonic Project Office; the Space and Missile Defense Command (SMDC); and the Combat Capabilities Development Command Aviation & Missile Center (DEVCOM AVMC), contributed to the effort. The Navy Strategic Systems Programs office was responsible for taking over glide body design responsibility from the Office of the Secretary of Defense.

Sandia increased capacity to support the builds by using, and simultaneously training, industry technicians and engineers.

Across these stakeholders, there was not a complete technical data package, at any level, for the experimental flight units. A technical data package provides the authoritative technical information on a system, including design configuration, performance requirements and applicable data and standards. With detailed components such as drawings, specifications and software documentation, the package establishes common ground for engineers and other personnel who are working on different aspects of the same mission. The technical data package would be critical to the Army efforts to transition the production of the glide body out of government laboratories and into a new commercial industrial base for hypersonics in the United States defense sector. Once established, this industrial base would be capable of supporting the glide body production demands of the joint services, both for prototype systems and potential future programs of record.

After all the challenges, the must-have acceleration and the many "firsts" of the hypersonics program, along came the COVID-19 pandemic. The dangers of the virus required the government-industry team to rapidly adapt to new working conditions and to implement several creative measures to safely stay on track. Despite all of these complications, however, the Army Hypersonic Project Office set its course, made tremendous strides in the past 18 months and is well on the way to achieving the mission.

TAKING FLIGHT

When hypersonics was considered an experiment—before the U.S. adjusted its prioritization and investments in response to great power competition—the typical schedule for hypersonic flight tests was approximately once every three years. Under new priorities, flight tests will occur much more frequently to advance and inform hypersonic development and fielding.

A major milestone occurred on March 19, 2020, when the Navy and Army successfully executed Flight Experiment 2. The launch of the glide body, which flew at hypersonic speed and with precision accuracy to a designated impact point, met its objectives. As the Army marches toward fielding the LRHW prototype, joint flight tests will be conducted every six to 12 months. To execute the initial planned tests, Sandia National Laboratories is now being asked to design and build glide bodies at a much faster pace.

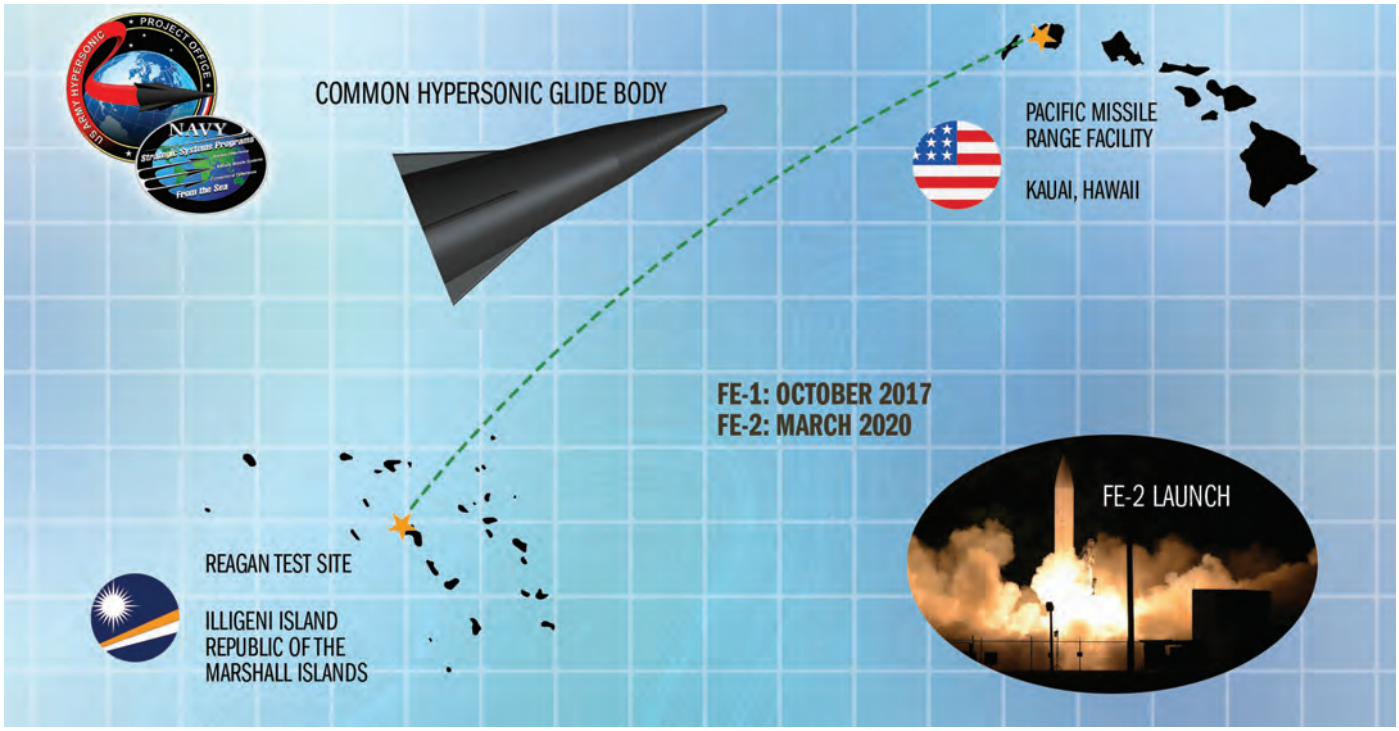


THANKING THE TEAM

Secretary of the Army Ryan D. McCarthy visited defense contractor facilities and government offices at Redstone Arsenal, Alabama, on July 1 to thank personnel for their work on high-priority Army projects during the COVID-19 pandemic. (Photo by Sgt. James Harvey)

This tremendous ramp-up in schedule requires processing the glide bodies for upcoming tests in a staggered, parallel fashion, rather than one at a time, while also requiring component procurement to run in tandem with the design and development effort. For example, the team is conducting final assembly and testing of the glide body for the most imminent test and building assemblies for the next test vehicles, while procuring components like include circuit cards, electronic modules, and cables. While the standard engineering practice is to design, build, test and then produce the final production technical data package, the Army Hypersonics Project Office team is developing the engineering-level design documents, then building and developing a production-level technical data package, concurrently with a series of tests to finalize the complete design. Obviously there is risk of rework in this methodology if there is a test failure, but that risk is outweighed by the need to move quickly to deter or defeat our near-peer competitors.

The product-level technical data package is planned to transition glide body production out of government labs and into industry, with the first contract for prototype glide body production awarded to Dynetics Technical Solutions in August 2019. Likewise, trained personnel who understand the technology and design details are critical to transition of this technology from Sandia to Dynetics and its subcontractors. Additional personnel provided by Dynetics and its subcontractors have received



JOINT TEST EXPERIMENTS

Hypersonic weapons, capable of flying at speeds greater than five times the speed of sound (Mach 5), are highly maneuverable and operate at varying altitudes. During two recent successful joint test events, Flight Experiment 1 (FE-1) in October 2017 and Flight Experiment 2 (FE-2) in March 2020, the Common Hypersonic Glide Body achieved sustained hypersonic glide at target distances. (Graphic courtesy of RCCTO)

training from Sandia in order to execute the parallel builds. These trained technicians can then transfer that knowledge to industry's production facilities.

In another major effort, the Army and Navy aligned all stakeholders onto a common schedule of glide body testing and production, in order to support Army prototype delivery in the 2023 fiscal year and Navy prototype delivery in the 2025 fiscal year. Flipping the switch from the occasional flight test every few years to flight tests every year, or more frequently, in conjunction with design development while preparing for production, was no small task, involving synchronization of hundreds of joint program milestones and documents ranging from critical design reviews to classification guides to new equipment training plans. The joint team also worked through culture gaps and the dynamics of "forming, storming and norming" to quickly begin performing at a high level. A key factor in making all of this happen quickly was the professionalism of the team and the shared understanding of the industry partners regarding the importance of the hypersonics mission to the National Defense Strategy. Seeing Russian and Chinese hypersonic advancements in the news headlines provided consistent reinforcement.

BRINGING TECHNOLOGY AND STAKEHOLDERS TOGETHER

As plans were established to achieve all critical test and production activities, it quickly became apparent that the small community of engineers and technicians who had been working glide body efforts for many years would not be sufficient to meet the new quantity and schedule demands in place. Industry partners needed to be brought up to speed and trained on the glide body design and production methods, and the Sandia team would need additional personnel to conduct all of the work now facing it. A lack of resources extended beyond technical expertise, and included more mundane tasks such as support for all of the procurement activities, building or procuring additional test

equipment, finding facilities to conduct all the work and building the industrial capacity to meet the demand for leading-edge technologies.

To begin transitioning that information to industry partners, the team leveraged a mix of Navy and Army contracts, along with support agreements among the Army, Navy and Sandia. The first transition efforts dealt with the industry team reviewing Sandia's "Block 0" glide body designs for production issues, providing options to obtain long-lead or expensive items, and a variety of other concerns. That work has paid off in several significant ways. One of those enabled the team to move from an expensive, custom-built, high-voltage capacitor to using a redesigned capacitor, reducing cost by more than 70 percent for this one component. Weekly meetings were quickly established to discuss every aspect of these module builds, from documentation to procurement of parts and test requirements.



A HYPERSONIC TEST
On March 19, DOD successfully tested a hypersonic glide body in a flight experiment executed by the U.S. Navy and U.S. Army from the Pacific Missile Range Facility, Kauai, Hawaii. Information gathered from this and future experiments will further inform DOD's hypersonic technology development, officials say. (U.S. Army photo)

Sandia's status as a federally funded research and development center made it easier to bring in contractors from outside their mission. Since Sandia's focus was not on production, it understood the importance of transitioning this work to another team. Had this handoff occurred between traditional industrial partners, time would have been a concern as hurdles such as contract modifications, which can take months to process, would have come into play.

Sandia increased capacity to support the builds by using, and simultaneously training, industry technicians and engineers. In just a few months, the experts at Sandia developed a comprehensive training course, starting with the design theory and progressing to hands-on activities with flight hardware in the lab. This leader-follower approach allows the industry team to learn and become proficient before they are contractually obligated to assemble, integrate and test production hardware in their own facilities, such as the Dynetics facility in Huntsville, Alabama. Sandia, with a heritage that includes nuclear weapons, had never before permitted anyone other than its own personnel to build or test hardware in its labs. Bringing industry partners on board to learn hypersonics required the creation of a "guest worker" policy and new course material. This innovative effort ultimately established a solid foundation for the training program and a more rapid transition from lab prototyping to industry production.

While looking at putting a second cadre of industry personnel through training, the Sandia team came to realize that its new industry partners were more than up to the task. In order to keep Sandia's experts focused on building and testing hardware, the team decided to use several of the newly trained industry team members to conduct the second round of training. Freeing up the Sandia experts from these training duties also gave the industry partners a dry run for its training teams to get experience before heading home to Huntsville, where they would eventually replicate the glide body activities in their own facilities. Ultimately, this effort produced a "badgeless" government and industry team focused on meeting the mission and common goals. An outsider walking through the labs and talking to the technicians and engineers would not know if they were talking to members of the Sandia team or an employee of any one of the three industry partners performing work on-site.

As part of the Office of the Secretary of Defense Conventional Prompt Strike effort, the services are partnering to execute hypersonics through the use of a common glide body, missile design similarities and joint test opportunities.

In parallel to all of the hardware work in the labs were the design activities. There were no standardized hypersonic design processes or tools across the government, which resulted in numerous challenges to overcome. For example, each organization had different software tools. Yet, in a surprisingly quick decision, the team settled on one product life cycle management tool to manage all the needs for real-time information sharing, classification, data visualization, and collaboration across multidisciplinary, geographically separated teams. This move to a common platform was a significant investment both in dollars and time. As anyone who has been involved in bringing a new major software system online across an enterprise knows, it's not always a smooth transition. However, this initiative has provided significant benefits, such as being able to transfer the integrated design from one organization to another while retaining the structure and documentation links necessary to capture the design, provide a common access point for review approvals and provide the ability to create and share the current approved, "as built" configuration lists, on demand.

SUCCESS DURING A PANDEMIC

Just as the team was starting to feel confident, with various training sessions completed, integrated product teams collaborating and new contracts and support agreements executing, along came COVID-19. The initial reaction to COVID-19 was confusion, uncertainty and disarray; but not for long. How did the team keep everything on track? First, it started with the people. Across the board, whether military, government civilians or members of the industry team, everyone was committed to the mission, as well as utmost importance of personnel safety.

As soon as things shut down across the country, the team started making use of teleconferencing and video conferencing tools available to them. With the various firewalls in place at the different organizations and on the virtual private networks, no single tool initially worked for everyone. The industry partners were amazingly quick to open up access to their knowledge base and technology for their government peers, and the same was true on the government side for our industry partners.

Physical work in the labs was another issue altogether. The Sandia medical team worked with the program to develop risk-mitigating methods for working in close quarters. These measures included procuring personal protective equipment, rearranging lab space, opening additional lab space, adding clear barriers and installing a closed circuit video system. The video system allows for a limited number of people in the labs, while others can remotely "look over their shoulders" at the work being performed. To date, despite the close quarters and a few self-quarantines because of potential secondary exposure, as of this writing there has not been a single case of COVID-19 among the combined team at Sandia.

A GREAT TEAM STORY

The hypersonics team was given a critical mission that would have been tough enough without having to deal with a pandemic. Through it all, a team of dedicated professionals demonstrated what government and industry can do when working together. By and large, issues inherent to establishing a new organization out of disparate, previously existing teams were set aside. While there is still plenty of work to be done, the joint team is on track to field this new hypersonic prototype battery capability before October 2023.

For more information, go to the RCCTO website at: ***https://rapidcapabilitiesoffice.army.mil/.***

RAYMOND D. WESLEY is the deputy program manager for the glide body production. He joined the Army Hypersonics Project Office in March 2019, bringing with him more than 20 years of manufacturing and program management experience from industry and government service. He has a B.S. in mechanical engineering from the University of Central Florida, is Level III certified in engineering, in program management and in production, quality and manufacturing, and is a member of the Army Acquisition Corps.

VIRTUAL WARD

Medical devices, MEDHUB enable hospital to send COVID-19 patients home sooner.

by Ashley N. Force

When patients are hospitalized with COVID-19, they are not the only ones whose health is in jeopardy. Other patients and health care providers also are at risk of the disease. To help combat this, the Carl R. Darnall Army Medical Center at Fort Hood, Texas, established a virtual ward powered by the Transport Telemedicine Systems' Medical Hands-free Unified Broadcast, better known as MEDHUB. The new ward officially kicked off in August and enables stable patients, including those with COVID-19, to be discharged home with additional monitoring capabilities.

"In the beginning of the pandemic, the projected numbers indicated we would soon be overwhelmed as far as bed space and staff to take care of patients," said Lt. Col. Amanda Love, executive officer of Darnall Army Medical Center. "We were trying to think of ways to provide the most care possible. One of the ideas was this virtual ward concept."

The virtual ward is fittingly named because it extends hospital space remotely. It's similar to a ward in a physical hospital, only instead of being staffed with a direct-care person, the virtual ward is staffed to manage many patients from a distance. The virtual ward is not a physical space but an added capability to remotely monitor patients while they are being cared for by family and friends. The virtual ward received four MEDHUB systems to test this concept. There are nurse case managers and a physician "virtualist" to monitor patients.



KITTED UP
The MEDHUB system kits each contain a cellphone with the MEDHUB software, a pulse oximeter and blood pressure monitor. Each patient assigned to the Carl R. Darnall Army Medical Center Virtual Ward receives one. (Photo by Jennifer Lee)



MADE EASY TO USE

Spc. Nathaniel Coleman, a treatment noncommissioned officer with the 44th Medical Battalion, demonstrates the MEDHUB system in a field hospital setting. The MEDHUB system was refined for a more user-friendly interface in the fall of 2020. (Photo by U.S. Army Medical Materiel Agency)

DEFINE 'VIRTUAL'

Patients who qualify for the virtual ward are deemed to be clinically at low risk; they do not meet the threshold of needing extra care in the hospital but should still be monitored. The hospital sends these patients home with medical devices that allow hospital staff to watch them from Darnall, while allowing their family members to help care for them.

The patient-monitoring capabilities are made possible by the MEDHUB system of the U.S. Army Medical Materiel Development Activity (USAMMDA). A new variation of this system was rapidly produced to meet the mission needs of the virtual ward. The MEDHUB concept was established in 2017 to serve as a medical communication platform that exchanges trauma patient information between U.S. Army medics and the hospitals receiving them during medical evacuations.

Typically, messages would be delivered from an ambulance to a field hospital using DOD satellite radio networks. Engineers within USAMMDA's Warfighter Health, Performance and Evacuation Project Management Office, as well as a software team at the Software, Simulation, Systems Engineering and Integration (S3I) Directorate within the U.S. Army Combat Capabilities Development Command Aviation & Missile Center, tailored MEDHUB's software to support home monitoring at the virtual ward.

"I am so proud of all the people who worked on producing a variation of MEDHUB within 60 days. In my opinion, that is an amazing feat," said Jay Wang, the product manager in the Warfighter Health, Performance and Evacuation Project Management Office. "It is exciting and validating to have our system and software platform in real-world applications and operations."

MEDHUB's modified software allows for patients who do not require ventilation to recover at home and have their medical information virtually transmitted to the Darnall Medical Center. Patient information is exchanged using cellular networks in place of the DOD satellite radio networks, for which the MEDHUB system was originally programmed. This modification required the software team at S3I to develop a custom virtual ward website for the clinicians at Darnall.

ADAPTING THE DEVICE

To support the virtual ward, MEDHUB underwent a software change to track patient medical information. The original version of MEDHUB tracks each occurrence when a patient is transported in an ambulance. Their medical data is displayed at the hospital for the duration of the medical evacuation, which lasts anywhere from 15 to 30 minutes. With the virtual ward software, patient information is tracked over the course of several days in a patient's home, versus the short ambulance ride.

Heart rate, blood pressure, oxygenation and temperature are some of the data that MEDHUB monitors in patients at home. These signals are especially important to track among COVID-19 patients. Higher heart rate and temperature indicate that a person may have active disease state and be likely to transmit the virus. Oxygen saturation is also a big indicator that someone might be displaying effects of COVID-19. It is a respiratory disease; therefore, as a patient's oxygen saturation goes down, they will have more difficulty breathing.

THERE'S AN APP FOR THAT

MEDHUB's easy-to-use system works as an app on a smartphone. Data collected

by medical devices, such as pulse oximeter and blood-pressure cuff, is sent via Bluetooth to smartphone connected to the patient's home WiFi. That, in turn, transmits the data so that hospital staff can access it. The app also allows the patient to view their readings from the wireless vital sign monitors. The pulse oximeter, which attaches to the patient's finger, measures the patient's heart rate and oxygen saturation levels. The blood pressure monitor will measure the systolic and diastolic blood pressure. With these devices and the MEDHUB app, the clinician can view and import the patient's previous and current vital signs remotely in near-real time.

Before sending the patient home for monitoring, the hospital staff walks through the process and sets up the devices with them, ensuring that they know how to use the technology when they go home.

"We only send patients home if we are comfortable with their skill level to handle the technology, and their health is stable enough," said Love.

Since the virtual ward launched in August, the MEDHUB team has been continually refining the device's interface to be more user friendly.

"We fixed simple things, like making sure the user does not have to log in every time. We fixed graphical display issues," said Wang. "We are making a new user interface because the original one was designed for medics out on the battlefield, so there were about five screens to look at."

INTERFACE-LIFT

The user interface is getting a significant upgrade in the fall of 2020. MEDHUB's development team will kick off a generation two software for the home users, which will show the basic vitals on a single screen instead of five.

As of September, four MEDHUB systems had been deployed to the virtual ward, and six additional systems were being worked on. Three patients had participated in the virtual ward as of September, and all had successfully recovered in the comfort of their own homes.

"We sent one of our COVID recovery patients home with it, and I think that the additional level of comfort being home helped in their recovery," said Love.

Love said the patient had been at the hospital for longer than they would have liked. Moving to the virtual ward helped alleviate the stress of being away from home. The patient knew the hospital staff was still watching them, but in a familiar place.

"We do a lot in the hospital for our patients, but it is a busy place, and resting can be tough when there are lots of people around," said Love.

Both the Darnall Medical Center virtual ward team and the MEDHUB team are confident that they are ready for any future situations that may cause an influx of patients again.

"A cellphone, pulse oximeter, blood pressure cuff and a thermometer are all you need to get MEDHUB running. If we get more patients, we will be ready to build more MEDHUB units," said Wang.

CONCLUSION

This is not the first time MEDHUB has been quickly adapted to assist an Army medicine mission. In July 2020, the MEDHUB development team configured specialized MEDHUB kits for the 30th Medical Brigade in Landstuhl, Germany. The system works for them as a clinic, passing messages from inside a Role of Care 1 battalion aid station or Role of Care 2 forward resuscitative surgical team, for example, from bedside to the nursing station inside the tent. This variation of MEDHUB enables the medical personnel in the clinic to see information from many patients within the tent system all on one laptop.

"As long as patient data is being passed from one place to another, MEDHUB can be modified to support," said Wang.

Medical evacuations, pandemics, medical tent systems—MEDHUB's adaptability has proven to be an asset in the current worldwide health situation as well as for the future readiness of our military forces when they encounter threats to their health. The virtual ward powered by MEDHUB has introduced a new way for hospitals to treat patients, keep health care providers safe and safeguard the health of service members.

For more information on the MEDHUB program and other projects being developed by the U.S. Army Medical Materiel Development Activity, go to the USAMMDA website at ***https://www.usammda.army.mil/.***

ASHLEY N. FORCE is functional analyst with General Dynamics Information Technology, providing contract support for the Public Affairs Office at the U.S. Army Medical Materiel Development Activity, responsible for performing research and functional analysis on a variety of projects including event coordination, media coverage, article writing and social media management. She holds a B.A. in journalism from Rowan University. She has worked in television news as a general assignment reporter and desk anchor for the CBS-affiliated stations KPIC and KVAL News in Eugene, Oregon.

IMPROVING ***THE FIGHT***

There may never be a silver bullet for defeating COVID-19—instead, it may require defense in depth, including three possible weapons from USAMMDA.

by Carey A. Phillips

The U.S. Army Medical Materiel Development Activity's Warfighter Protection and Acute Care (WPAC) Project Management Office (PMO) has taken on many infectious diseases over the years, successfully developing drugs and devices to prevent, diagnose and treat diseases such as malaria, adenovirus types 4 and 7, and leishmaniasis—just to name a few. So when COVID-19 emerged, the WPAC team did not hesitate to take on the challenge of improving COVID detection and treatment options.

"Improved detection and drug treatment options are important tools to our warfighters and the nation in the fight against SARS-CoV-2, the virus that causes COVID," said Dr. Lawrence Lightner, project manager for the WPAC PMO. "Diagnostics and treatment drugs will help prevent the further spread of SARS-CoV-2 and can potentially save lives of those infected."

In May 2020, the Defense Health Agency (DHA) selected 10 projects to receive Tier 1 acquisition program investments to support the COVID-19 efforts. DHA stood this program up in response to COVID-19, as a way to rank proposals and choose which to apply initial funding. The Tier 1 acquisition program investments aim to supply testing capabilities that can be rapidly deployed, as well as to improve existing testing capabilities, vaccines and treatments. The WPAC group submitted several projects for consideration, and three projects were selected.

Comprised of military, civilian and contractor personnel, the WPAC group works together to develop and deliver infectious disease drug treatments, vaccines and diagnostics to protect and sustain our nation's warfighters. The group is applying the DHA funding to improve capabilities to detect the COVID virus and the body's response to it, as well as to develop a candidate treatment.



EMERGENCY USE AUTHORIZATION

The BioFire Defense COVID-19 test was authorized for emergency use on March 23 by the FDA. The test is performed on the BioFire FilmArray instrument, which is already present in many DOD facilities. (Photo courtesy of BioFire Defense)

The three WPAC projects selected to receive Tier 1 acquisition program investments are:

The *phospholipase A2* (PLA2) inhibitor, varespladib, for SARS-CoV-2-related acute respiratory distress syndrome treatment. Acute respiratory distress syndrome is marked by inflammation and fluid build-up that diminishes oxygen supply and causes lung dysfunction.

FDA approval of the BioFire Defense COVID-19 test using the statutory 510(k) pathway with Sample Type Expansion under emergency use authorization. The 510(k) pathway is one mechanism for attaining FDA approval.

The SARS-CoV-2 Rapid Diagnostic Lateral Flow Tests for direct antigen detection and serology. A lateral flow diagnostic test is essentially a "test strip" where a patient sample and sample buffer, liquid, is applied to one end of the strip, which then indicates a positive or negative result.

PLA2 Inhibitor for SARS-CoV-2-related acute respiratory distress syndrome—varespladib

The secreted PLA2, varespladib, for SARS-CoV-2-related acute respiratory distress syndrome treatment is a small-molecule drug that dampens activity of the molecule called *phospholipase A2*. Small-molecule drugs have a low molecular weight, generally meaning they can be taken orally. PLA2 is associated with inflammation, other impairments and destruction in the lung, characteristic of acute respiratory distress syndrome. COVID-19 is one of several diseases that results in acute respiratory distress syndrome, which leads to the degradation of lung function, inadequate oxygen supply and frequently, severe long-term breathing problems and even death.

Together with the industry partner, Ophirex, Inc., WPAC PMO is working to develop varespladib as an acute respiratory distress syndrome preventative and treatment for COVID-19 patients. The intent of drug treatment is minimized hospitalization, critical care treatment and survival of COVID-19 patients. While PLA2 is a major component of snake venom, humans also produce PLA2. For us, it acts in a pro-inflammatory cascade and in disintegration of lung surfactant, a protective layer that prevents fluid retention in the lungs. PLA2 inhibition is therefore hypothesized to reduce inflammation and protect or restore surfactant to aid lung function.

"This test detects SARS-CoV-2 nucleic acid with a high degree of specificity and sensitivity. The virus can't hide from this test."

The intent of drug treatment is minimized hospitalization, critical care treatment and survival of COVID-19 patients.

On June 19, 2020, USAMMDA and the U.S. Army Medical Research Acquisition Activity (USAMRAA), subordinate commands of the U.S. Army Medical Research and Development Command, awarded Ophirex, Inc., a $9.9 million contract to manufacture two versions of the drug—a tablet and an injectable version—to be tested in clinical trials starting this year. The tablet, to be taken orally, is intended to treat moderate or recovering cases. The injectable version can be infused into patients with more severe symptoms.

"This drug doesn't kill SARS-CoV-2. Instead, it is anticipated to stop what the virus does to the body—the symptoms of COVID-19 that are killing people and keeping them in the hospital," said Dr. Lindsey Garver, product manager for this effort within the WPAC Project Management Office. "Since it's already been studied for other purposes, we know a lot about its safety profile and can move very quickly to implementation and, hopefully, saving lives."

Varespladib is currently being evaluated as a treatment for venomous snakebites. It was previously tested against sepsis and acute coronary syndromes—trials that showed it to be safe and well-tolerated in patients, though not particularly effective in those conditions.

Regulatory progression of BioFire Defense's COVID-19 test and Sample Type Expansion

The U.S. Food and Drug Administration (FDA) authorized the BioFire Defense COVID-19 test for emergency use on March 23, 2020. The test provides a "detected" or "not detected" report about 50 minutes after a sample, collected via a nasopharyngeal swab in transport medium, is loaded for analysis. The test is performed on the BioFire FilmArray instrument, which is already present in many Department of Defense facilities.

"We are capitalizing on the work done by our colleagues at JPEO-CBRND [Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense] earlier this year, when they partnered with BioFire Defense to start the development of the COVID-19 test," said Dr. Clifford Snyder, product manager for this effort within the WPAC PMO. "This test detects SARS-CoV-2 nucleic acid with a high degree of specificity and sensitivity. The virus can't hide from this test."

The FDA's emergency use authorization allows this test to be used, however, the 510(k) route to FDA clearance, which involves the acquisition of additional performance data, will provide additional confidence in the accuracy of test results and support use of the test even after the COVID-19 emergency expires. The WPAC group worked closely with USAMRAA to finalize BioFire Defense's commitment to perform the required studies. On June 4, 2020, a $3.1 million contract was awarded to BioFire Defense, with completion expected by June 2021.

WPAC has also initiated work on expansion of the range of sample types for the COVID-19 test, in order to address challenges associated with obtaining nasopharyngeal swab specimens, possible shortages of swabs and viral transport medium, and to examine whether the testing of additional sample types might



TEST CREATION

Tests currently in development by InBios International will be able to identify people infected with SARS-CoV-2. Each of these tests will provide results within 15 to 30 minutes of sample collection. (Image courtesy of InBios International)

otherwise be advantageous. On October 14, 2020, USAMRAA issued a contract to BioFire Defense to support investigation of the use of its COVID-19 test with nasal swabs, throat swabs, sputum and saliva—the contract value of those efforts is $1 million.

"Our objective is to wring every bit of value we can out of this test. Our users deserve nothing less," said Snyder.

SARS-CoV-2 Rapid Diagnostic Lateral Flow Tests for direct antigen detection and serology

The SARS-CoV-2 Rapid Diagnostic Lateral Flow Tests for direct antigen detection and serology includes two point-of-care diagnostic tests that will be able to identify persons infected with and infer recent or prior infection with SARS-CoV-2. These tests are the SCoV-2 Ag Detect and SCoV-2 Ab Detect, and both will be able to provide results within 15 to 30 minutes of sample collection.

Collected by nasopharyngeal swab, the SCOV-2 Ag Detect is a direct antigen-based test that uses a proprietary dipstick-like test to detect several SARS-CoV-2 antigen targets present in respiratory samples.

The SCoV-2 Ab Detect is also a dipstick-like serology test that will use blood collected by finger stick to detect SARS-CoV-2-specific immunoglobulin M and immunoglobulin G antibodies in individuals who meet either clinical or epidemiological criteria to infer recent or prior infection in accordance with FDA guidelines.

Leveraging its existing indefinite delivery and indefinite quantity contract with InBios International, USAMMDA awarded a task order on June 15, 2020, for $11.9 million to support the development of both of these diagnostic tests to achieve emergency use authorization and ultimately 510(k) clearance with the FDA. The DHA is funding development activities occurring in the 2020 fiscal year for emergency use authorization.

The WPAC group works together to develop and deliver infectious disease drug treatments, vaccines and diagnostics to protect and sustain our nation's warfighters.

To support and fund fiscal year 2021-2022 development activities to achieve FDA 510(k)-clearance, USAMMDA has partnered with the U.S. Department of Health and Human Services' Biomedical Advanced Research and Development Authority.

The intent is to improve testing to deliver faster, more accurate detection of SARS-CoV-2. This can streamline surveillance of virus transmission, minimizing the COVID patient's time in quarantine, reducing asymptomatic contact and relieving the burden on testing labs.

CONCLUSION

The Department of Defense is committed to protecting the health and safety of our warfighters, as well as to leveraging our unique capabilities and partnerships that strengthen the whole-of-government approach to fighting the worldwide COVID-19 pandemic.

"USAMMDA teams work every day to develop and deliver a broad array of lifesaving medical products for our warfighters," said Col. Gina Adam, USAMMMDA commander. "The WPAC PMO's efforts showcase this breadth and the development of promising technologies to save lives across the nation."

The successful development of these projects is intended to benefit both military and civilian populations. With a mission to develop and deliver quality medical capabilities to protect, treat and sustain the health of our nation's service members, USAMMDA remains focused on providing life-saving drugs and devices that meet or exceed the intended requirements of the DOD. Without question, the men and women of the WPAC PMO team serve to highlight the determination and proficiency of the entire organization.

For more information on the Warfighter Protection and Acute Care Project Management Office and other projects being developed by the U.S. Army Medical Materiel Development Activity, visit the USAMMDA website at ***https://www.usammda.army.mil/.***

CAREY A. PHILLIPS is chief of public affairs for the U.S. Army Medical Materiel Development Activity, Fort Detrick, Maryland. She has been with USAMMDA for the past 12 years, having previously served in the U.S. Navy as a mass communications petty officer, second class. She holds a B.A. in visual communications from Framingham State College in Framingham, Massachusetts and an M.S. in management with a concentration in marketing from University of Maryland, University College.



MUMBI THANDE-KAMIRU

COMMAND/ORGANIZATION:
Deputy Undersecretary of the Army for Test and Evaluation

TITLE: Program analyst

YEARS OF SERVICE IN WORKFORCE: 13

AAW/DAWIA CERTIFICATIONS:
Level III in test and evaluation

EDUCATION: B.S. in environmental science with an emphasis in marine biology

AWARDS: Commander's Award, 2018

PRACTICAL LIFE LESSONS

Mumbi Thande-Kamiru knows how to tell a story. Like, when her parents moved the family from the District of Columbia to Kenya and started a farm. Or when she taught GED classes in Maryland. Or when she participated in Model United Nations debates in the actual General Assembly hall at the United Nations Office at Nairobi, the UN's headquarters in Africa. Or when her dad sent her around the neighborhood selling vegetables, to teach her a new skill. She has a fascinating background, which is just what her parents intended.

"My parents were kind of nomads," she laughed. "They were very invested in us understanding as many potential walks of life as possible." And she took that lesson to heart, studying environmental science in college and focusing on classes that were both interesting and useful. "I've always been interested in the practicality of knowledge, like, it doesn't make sense to know all these things if there's no practical application." So, no Underwater Basket Weaving 101 for her.

Today, Thande-Kamiru works as a program analyst for the Deputy Undersecretary of the Army for Test and Evaluation (DUSA T&E). "I assist DUSA T&E in providing oversight to the T&E portfolio for the Army," she said. "I am tasked with understanding the sustainment and real property needs of the T&E enterprise." It doesn't get much more practical than *that*.

So, how did she end up there? "After college, I was working for the Frederick County Health Department in Maryland, inspecting schools, food service facilities and other buildings, ensuring sanitation and safety." When a family friend started talking about his work with the Army's Test and Evaluation Command (ATEC), she was intrigued. "I thought, oh, that sounds really interesting." She applied and was accepted to the Federal Career Intern Program, and she's never looked back. "When I started with the Army, I was in my early 20s," she said. "I had some very strong opinions about life. Working for the Army is really where I matured and where I understood the value of hard work." She learned the importance of trying and failing and trying again, of being a trusted teammate and of helping to guide others. "I've really appreciated the growth I've had professionally and personally, in regards to how I relate to people, and how I've learned to be more analytical, as well," she said. "I have worked with very smart people and was consistently challenged to learn more in terms of statistical analysis and test methodology, in addition to learning how to efficiently communicate key information to decision makers."

She recently completed the fiscal year 2020 Inspiring and Developing Excellence in Acquisition Leaders (IDEAL) program, which is sponsored by the Office of the Director of Acquisition Career Management. Targeted to midcareer Army Acquisition Workforce civilians at GS-12 through GS-14, the program prepares participants for future leadership positions. Thande-Kamiru said the experience

was very worthwhile, and she encouraged eligible civilians to apply. "I loved the content and I loved my cohort. I was blessed enough to have classmates who were honest, thoughtful and engaging," she said. "Our instructors were knowledgeable and open to helping us apply the lessons taught in class to our real life challenges." Always focused on the practicality of education, she is quick to share those lessons with others, providing encouragement and reassurance to junior acquisition personnel.

"I know it can be very intimidating when you first start," she said. "Be willing to work and be willing to learn from your mistakes and humbly admit them." Early in her career, she said she felt like she needed to be perfect at her job, and have the answers to every question—but that approach ultimately made things more difficult. "It held me back and even impeded my efficacy," she recalled. "I tell all the junior acquisition personnel to 'embrace the suck' and to be prepared to get back up after you have been knocked down." She also encourages them to build a broad network of professional connections from different career fields. "They can inform you of opportunities that are not on your radar and give you a loving push into opportunities that you may not have pursued."

Thande-Kamiru said she is grateful for the learning opportunities that she's been given in her career so far. "Where I was truly stretched was in the developmental assignments I took during my time at ATEC," she said. First, she took a part-time developmental assignment in ATEC's G-1 office, where she worked on policies for leadership development and mentorship. Next, she was assigned to the Strategic Initiatives Group with the Army Evaluation Center (AEC) headquarters. "There, I further developed a training initiative for AEC employees, on what they need to know to be an evaluator and test manager," she said. And she took advantage of just about any form of training that was offered to her. "I found leadership classes provided at Aberdeen Proving Ground [Maryland], such as the Emerging Leadership cohort classes, to be really helpful. They provided me an opportunity to look at challenges that I was facing at work from a different perspective and come up with solutions utilizing the skills I learned." The most important lesson she's learned so far is the importance of knowing her own worth. "It is so important to be your own best advocate," she said. "Whether it be advocating for new opportunities or whether it be standing up for your reputation, you have to be prepared to stand up for yourself sometimes."

Earlier this year, she put those theories to the test. She was working in a developmental assignment with the technical director of Aberdeen Test Center, assisting with strategic challenges facing the center. And then came the pandemic. "I was in this role when COVID-19 hit, and I was chosen to spearhead an effort to determine a disinfection protocol that would help keep the center open and safe," she said. Because of her background as an evaluator for decontamination solutions and her experience with data analysis, she was the right fit for the difficult task. "It was a challenging effort developing requirements and looking at the ever-growing list of EPA-approved systems. It was a great experience, and I'm thankful to my mentor for encouraging me to stretch myself and apply for the assignment," she said.

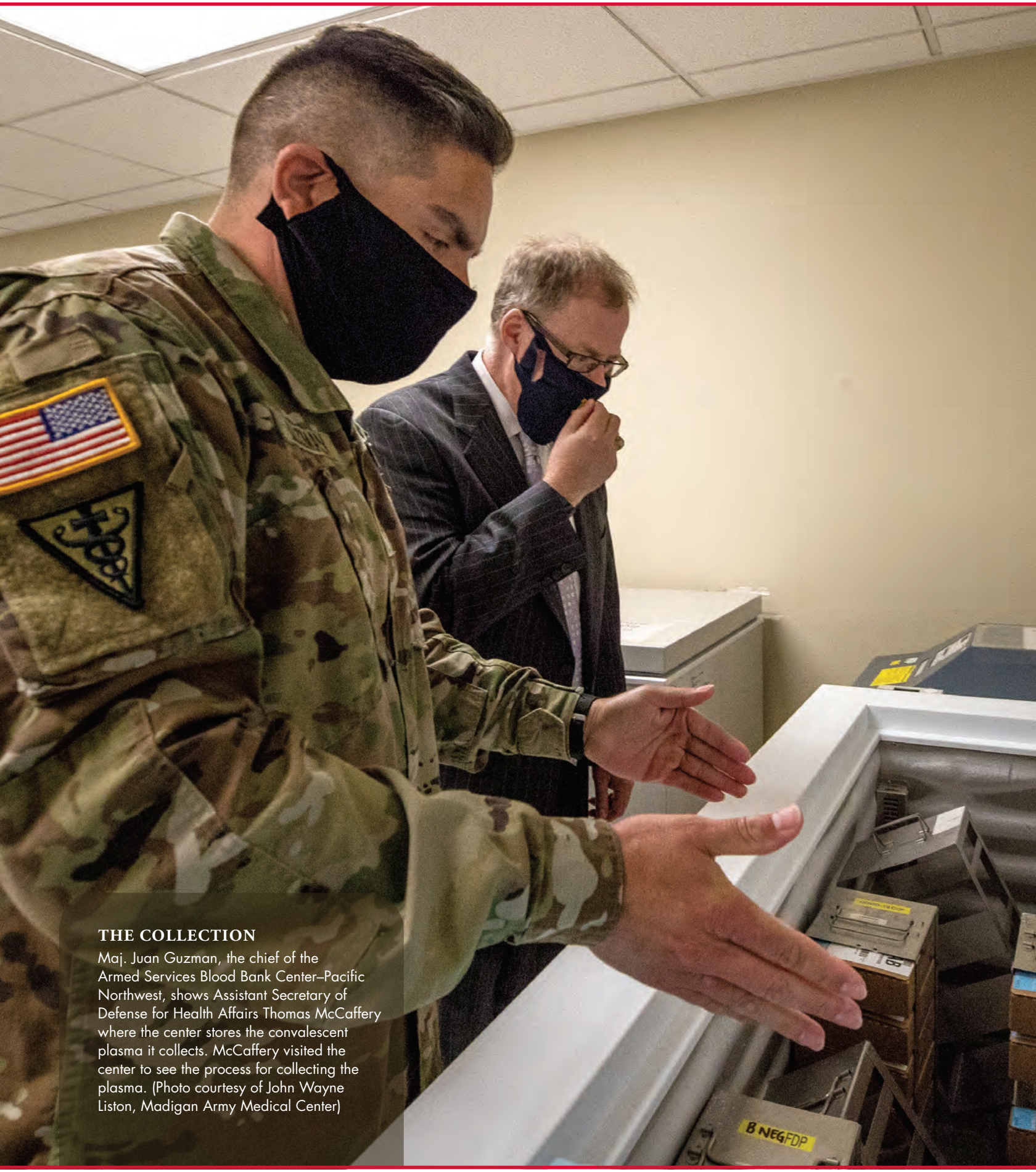
Thande-Kamiru, the story teller and perpetual student, is walking proof of her own advice—stay curious, try new things, know your worth and look for practical knowledge wherever possible.

—ELLEN SUMMEY



KEEP IT CLEAN

Thande-Kamiru, second from left, and safety engineer Michelle Brain, left, provide training on proper disinfecting processes at Aberdeen Test Center. (Photo by ATC Technical Imaging Division)



THE COLLECTION
Maj. Juan Guzman, the chief of the Armed Services Blood Bank Center–Pacific Northwest, shows Assistant Secretary of Defense for Health Affairs Thomas McCaffery where the center stores the convalescent plasma it collects. McCaffery visited the center to see the process for collecting the plasma. (Photo courtesy of John Wayne Liston, Madigan Army Medical Center)



MAGNIFICENT SEVEN

A team of seven helps hundreds of patients receive COVID-19 treatment.

by Ashley N. Force

The greatest threat to a globally spreading virus is a dedicated team of people working against it. An Army is even better.

The U.S. Army Medical Materiel Development Activity's (USAMMDA) Force Health Protection (FHP) Division has treated hundreds of COVID-19 patients at dozens of treatment sites on land, on aircraft and at sea.

The FHP Division has an important mission: It provides urgent investigational treatment, prophylactic or diagnostic capability to the warfighter against high-consequence threats when no U.S. Food and Drug Administration (FDA)-approved products or feasible solutions exist. It operates on behalf of the secretary of the Army as lead component, and the surgeon general of the Army under DOD Instruction 6200.02.

During the COVID-19 pandemic, FHP, in collaboration with the U.S. Army Medical Research and Development Command (USAMRDC), successfully carried out two treatment protocols and a distribution mission. Its efforts have provided, and continue to provide, additional treatment options to all COVID-19 patients within the Military Health System.

REMDESIVIR EXPANDED ACCESS PROTOCOL

The FHP Division provided the antiviral drug remdesivir to patients diagnosed with COVID-19 as a treatment option. This was accomplished through an expanded access protocol that allowed for early access before the initial COVID-19 clinical trial results. Remdesivir is a broad spectrum antiviral drug that was originally developed as a potential treatment for Ebola virus disease. Researchers found that it may not work perfectly for Ebola, but it showed great activity against COVID-19. See "Complex Mission, Clear Results," Page 28.)

In order to initiate an expanded access treatment, a protocol must first be written, submitted for review, and approved by the USAMRDC Headquarters Institutional Review Board (IRB), as well as the FDA. An investigational new drug application must be filed and approved by the FDA, and then have a number assigned to it. To obtain the product, FHP also must have an agreement in place with the product manufacturer.

"In our case, the product managers of remdesivir were initially under the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense," said Army Lt. Col. Sandi Parriott, director of FHP. "They had it in their portfolio for the Ebola virus."

In discussions with FHP about using remdesivir to treat a different disease, the initial product managers brought up the idea of the treatment against COVID-19. FHP worked with the product managers and the Gilead Life Sciences to put into place a cooperative research and development agreement (CRADA) with Gilead for COVID-19. The CRADA allowed a cross-reference between Gilead's FDA-issued number for remdesivir that allowed the Army surgeon general's sponsorship and use of the product under an FDA-approved FHP treatment protocol to DOD personnel worldwide. Gilead provided the 2,200 doses at no cost to the government.

FHP was in talks with Gilead for about three weeks in February 2020. The CRADA was signed on March 5, received FDA approval on March 17, and the product was received from Gilead on the same day. FHP received Institutional Review Board approval on March 18, shipped the product to their first site, and treated their first patient on March 26.

Parriott said remdesivir was chosen as a treatment option because it was shown to have activity against the coronavirus in animal models and in vitro assays. Also, it was the most advanced product identified during market research. It already had a developed safety profile, because it had been used in the Ebola treatment trials in the Democratic Republic of Congo in 2019.

"We knew it was safe, based on the safety profile. We were aware of potential temporary side effects, but it was the most advanced product that was available for a disease we didn't expect, or have any treatment for," said Parriott.

Patients who are being treated with remdesivir receive an intravenous injection once a day for five to 10 days, which is determined by the severity of symptoms. During treatment, the physician follows up with the patient to ensure there are no safety issues, providing updates to FHP on clinical progress, laboratory test results, and any potential issues that may be related to the investigational drug. Follow-ups for the patients treated with remdesivir continue for up to 29 days post-treatment. FHP's main goal is to provide an additional treatment option for patients while providing safety and outcome data to the FDA and the product manufacturer.



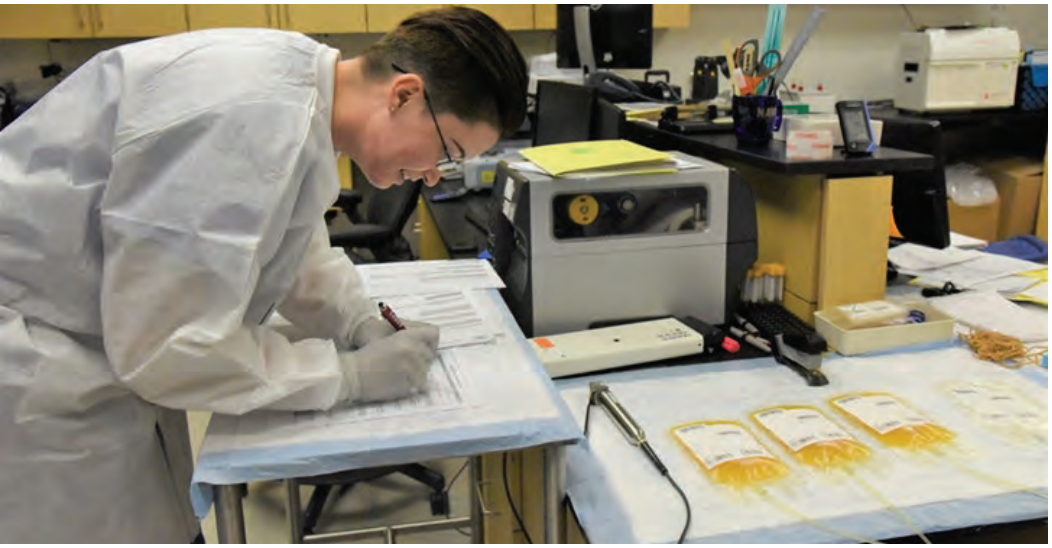
THE TREATMENT

Remdesivir is a broad-spectrum antiviral drug used to treat COVID-19 patients. (Photo by Tech. Sgt. Enjoli Saunders, U.S. Air National Guard)

CONVALESCENT PLASMA EXPANDED ACCESS PROTOCOL

FHP provided an additional expanded access protocol for COVID-19 convalescent plasma, which is used to treat COVID-19 patients with plasma taken from patients who have recovered from the virus. As of November 2020, 65 patients had been treated with convalescent plasma.

Convalescent plasma is plasma taken from patients who have already been infected with and recovered from COVID-19. The plasma contains antibodies that can



WEIGHING DONATIONS
U.S. Naval Hospital Guam Hospitalman Apprentice Rebekah Morrison records the weight of convalescent plasma units collected from Sailors who recovered from COVID-19. (Photo by Jaciyn Matanane, Naval Medical Forces Pacific)

help temporarily boost the body's ability to fight coronavirus. The idea to provide this treatment was developed through a collaboration between FHP and the U.S. Army Institute of Surgical Research. This treatment had enough anecdotal usage for other diseases to show that it might have some value by strengthening the immune system against COVID-19. The process of collecting plasma is already licensed and validated for the Armed Services Blood Program. The potential benefit of using convalescent plasma outweighed the low safety risk of transfusion plasma. FHP submitted its own investigational new drug application and expanded access protocol for convalescent plasma through the FDA for approval. However, before moving a product and processes forward, FHP requires approval from Thomas McCaffery, the assistant secretary of defense for health affairs.

Patients being treated with convalescent plasma receive no more than two units of plasma, depending on the physician's recommendation. After treatment, the physician follows up with the patient to ensure there are no safety issues related to the product, and provides regular updates on clinical progress and laboratory test results to FHP. Follow-ups for the patients treated with convalescent plasma continue for up to 31 days post-treatment.

EMERGENCY USE AUTHORIZATION DISTRIBUTION

FHP and USAMRDC's Office of Regulated Activities got the expanded access protocol for remdesivir, as well as convalescent plasma, written and approved faster than any of their previous expanded access protocols. This resulted in the Defense Health Agency selecting FHP to receive, store, distribute, and track remdesivir under an emergency use authorization.

FHP has managed the distribution of remdesivir to 63 sites worldwide as of November 2020. Before COVID-19, a typical protocol managed by FHP may have included three sites to oversee. At this writing, FHP has already shipped product for treating 648 patients and received 142 resupply requests solely related to COVID-19.

Marianne Erlichman has been working for USAMMDA's FHP division for 12 years. She has played a major role in coordinating the protocol sites and says FHP has never before managed this many sites and patients simultaneously.

"This has been a learning experience for everybody involved," said Erlichman. "Whenever we add a site, we have to do an amendment request to the USAMRDC HQ IRB. I am already up to amendment number 39 in just a few months. Normally, after several years, I might be at amendment number eight."

FHP has treatment sites all around the globe and throughout the United States. International sites include Japan, Guam, Djibouti, Afghanistan, Kuwait and others. The FHP team has not traveled to the sites, but instead conducted all set-up coordination remotely through phone and email correspondence.

Any DOD-owned military treatment facilities, including aircraft carriers, deployed field hospitals—both inside and outside the continental United States—and hospital ships such as the United States Navy Ship Comfort, can request to be a treatment location by contacting FHP with an

The FHP Division provided the antiviral drug remdesivir to patients diagnosed with COVID-19 as a treatment option.

inquiry. FHP then exchanges all necessary documents with the group, such as medical licenses and agreements, to become a treatment site. The sites are trained on the protocol and processes, and then documentation is submitted to the USAMRDC HQ IRB for approval. After FHP conducts a site-initiation visit and the product is in place, a patient can be enrolled into one of the treatment protocols.

An approved site can call FHP 24 hours a day, seven days a week in order to provide this treatment option to a patient. Before a patient can begin receiving treatment, the site must send FHP a signed consent form. FHP provides the patient with a special tracking number, which is specific for the protocol that is being activated. After this, the patient can begin treatment. Convalescent plasma for COVID-19 treatment is provided through the Armed Services Blood Program to the active sites, and must also be notified when there is a new patient.

"It's amazing how many sites we have," said Erlichman. "We have land-based treatment facilities, on ships and even aircraft carriers, which is a first for us."

Landstuhl Regional Medical Center (LRMC) in Germany was FHP's flagship site for both the expanded access for remdesivir and convalescent plasma protocols. Landstuhl has seen a number of patients from numerous locations including the Middle East, Africa, and Europe. It has been treating patients with COVID-19 infections across the spectrum of disease severity.

"We have had very good outcomes thus far with the patients that we have treated," said Army Lt. Col. Daniel Weinstein, Landstuhl's chief of internal medicine. "This is likely due to the combination of novel therapeutics, treatment strategies from other diseases that we have incorporated into our treatment plans, and the excellent care that our team provides to all patients that come to LRMC."

A wide range of patients were able to be treated through the expanded access protocols. These patients include active duty military, dependents, retired personnel, contractors, and in some countries, host nationals.

CONCLUSION

"We want to thank everyone involved in developing and implementing these and other treatments for COVID-19," said Weinstein. "This is a momentous task that requires efforts from all scopes of practice, research and development. We appreciate it."

There is one thing that the small yet resilient FHP team is in agreement with, aside from the increasing need for resilience—they are saving lives. They share a mutual satisfaction knowing that, among their efforts, they were able to provide treatment to 753 COVID-19 patients and counting. They have had direct involvement in making these critical treatments available, and in fulfilling their division's mission.

"I couldn't ask for a better team—more dedicated, more professional. At two o'clock in the morning, they are taking phone calls, providing customer service, and getting patients enrolled," said Parriott.

All this is taking place with a team of only seven. Parriott believes that after this experience, her team is ready to handle any future threat of this magnitude.

As Parriott said, "If everyone wasn't working together as a team, and focused on getting the warfighter treated, we would have never gotten there."

For more information on the Force Health Protection Division and other projects being developed or managed by the USAMMDA, please visit the USAMMDA website at ***https://www.usammda.army.mil/.***

ASHLEY N. FORCE is functional analyst for the public affairs office at the U.S. Army Medical Materiel Development Activity, responsible for performing research and functional analysis on a variety of projects including event coordination, media coverage, article writing and social media management. She holds a B.A. in journalism from Rowan University. Her journalistic experience stems from working in television news as a general assignment reporter and desk anchor for the CBS-affiliated stations KPIC and KVAL News in Eugene, Oregon.

TESTING PUT TO THE TEST

The COVID-19 pandemic forced U.S. Army Operational Test Command to innovate during a new system's operational test.

by Maj. Graham L. Mullins

The proverb "necessity is the mother of invention" is an apt description of operational testing during the coronavirus pandemic.

The General Fund Enterprise Business Systems replaces multiple legacy financial management systems that had been used for decades and integrates them across the functional business process areas of the Army. General Fund Enterprise Business Systems – Sensitive Activities (GFEBS-SA) does all that and restricts the information by a user's need to know. The GFEBS-SA initial operational test and evaluation was scheduled and planned in accordance with traditional enterprise systems testing procedures for over 18 months. The U.S. Army Operational Test Command team's plan included scheduled travel to test unit locations to observe the system in operation. Although COVID-19 prevented in-person testing, the project manager (PM) still needed an assessment before the fielding-decision deadline.

THE PROBLEM

The Army lacked a financial management system with functionality similar to GFEBS, but with added capability to conceal classified and sensitive activities. GFEBS-SA now provides this capability by processing classified and sensitive activities data in a protected environment. Additionally, the new system limits user access and restricts user visibility to authorized data only. The operational test for GFEBS-SA was originally scheduled for April and May 2020, across six different locations. The test headquarters would operate out of Arlington, Virginia, with additional testers and test participants at five geographically dispersed locations including Rome, New York; Indianapolis; Charlottesville, Virginia; San Antonio, Texas; and Fort Gordon, Georgia.

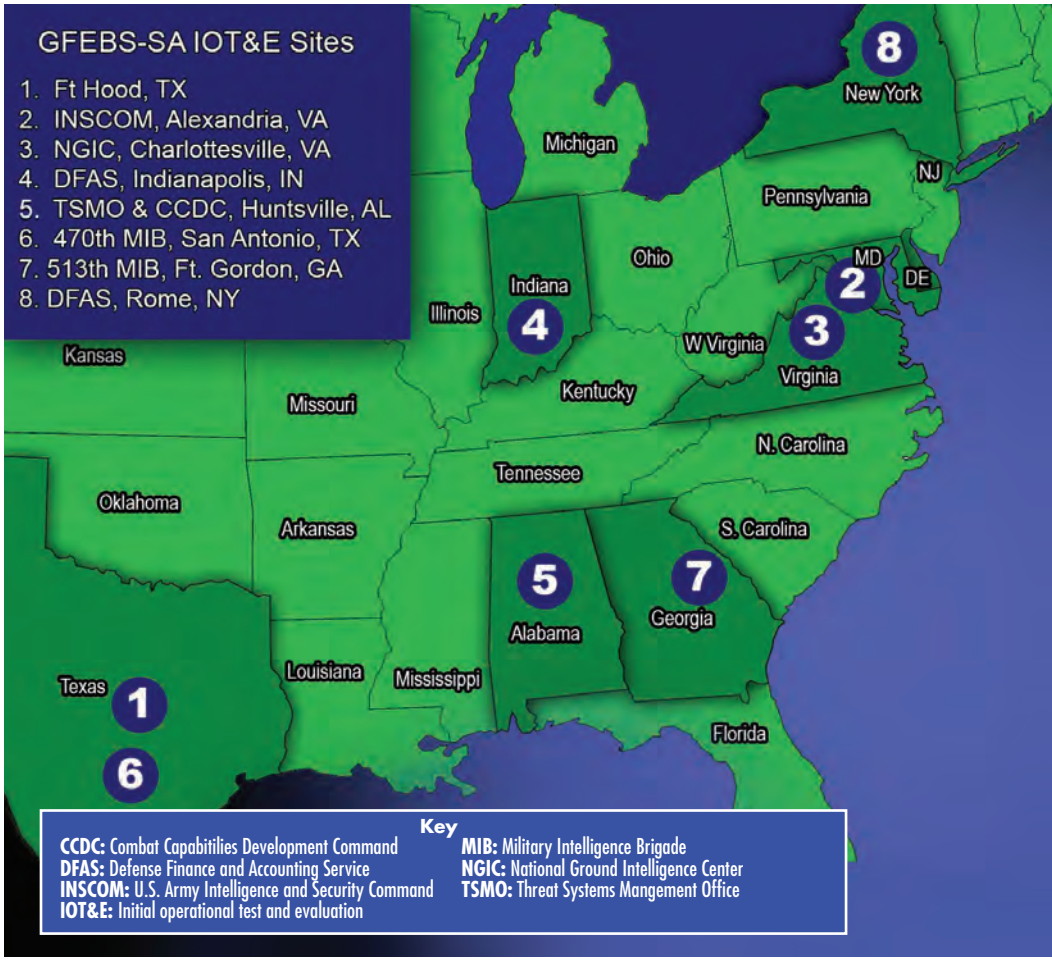
The operational test had been scheduled to be performed on a globally fielded live system. This meant the GFEBS-SA would be the system utilized by Army civilians to process sensitive financial activities starting in May 2020, regardless of whether testing had been completed. Without thorough testing, the PM shop would not have a way to ensure the software performed as intended. COVID-19 and the resulting quick DOD travel ban, however, made that impossible and forced postponement. The PM, in conjunction with Operational Test Command, had to find a way to complete the testing within constraints imposed by the timeline and COVID-19.

A SOLUTION

The team had no choice in the new normal of COVID-19. It had to find a way for testing to go on. The test team devised a method for distributed testing whereby test participants and data collectors were not on-site together at the test site, but distributed around the country. Testing this way increases the complexity and collaboration requirements for planning and executing the test; however, it simultaneously reduces the amount of travel, travel cost and physical interaction. Test teams regularly travel the country, working on-site with users of new equipment to put it through its paces. That ability to work side by side with users is useful and productive, but in a pandemic, it is also exceedingly dangerous. It was imperative that the Operational Test Command conducted this test because if the system did not work as intended, classified information would be vulnerable to collection.

The test team managed the operation from Fort Hood, Texas, and connected electronically to six of the units under test, via Secure Internet Protocol Router (SIPR) and Non-classified Internet Protocol Router (NIPR) (see Figure 1). A combination of technology and creative thinking enabled the test team to collect the required information to validate the program's success or failure. The team used two different types of monitoring software during the test, Morae and Elastic Stack. Morae is screen-capture software that allows analysts to review recorded interactions for completion. Elastic Stack is software that allows users to analyze and visualize data. During this test, Elastic Stack helped monitor the GFEBS-SA server and produce performance logs. This instrumentation was critical because it would make up for any information shortcomings in the manual data collection process.

FIGURE 1



WIDE DISPERSION

This map illustrates the geographic dispersion between test team headquarters and test site locations. Testing headquarters was in Arlington, Virginia, while additional test participants were located at Rome, New York; Indianapolis; Charlottesville, Virginia; San Antonio; and Fort Gordon, Georgia. (Images courtesy of U.S. Army Operational Test Command)

Traditionally, data collectors would be physically located with the users to observe and review all the transactions. If an incident should arise as part of a traditional test, a data collector captures it in a test incident report. For the GFEBS-SA test, however, the test team had to rely on the users to capture all test incidents as part of this unique distributed-test method. This significant change to its normal data collection process allowed Operational Test Command to record the same data without having to travel and physically interact with the test units. Executing this test data collection from Fort Hood resulted in a significant travel cost savings.

CHALLENGES

The most arduous step in this new testing process was receiving approval to

load Morae on the test unit's computers. GFEBS-SA operates on the SIPR network because of the classified nature of the information it handles. The security and network professionals who control these networks were very apprehensive about loading new software onto the networks. This required extensive coordination between the Fort Huachuca, Arizona-based Electronic Proving Ground, the software owners, and the network professionals at the test unit sites. Because of the nature of the classified data and using screen capture software, intelligence and security representatives from the unit sites were required to be involved to facilitate redaction of classified material. This level of coordination was time intensive and presented numerous friction points throughout test execution. Each headquarters and functional proponent had a different list of requirements the test team had to satisfy before they were allowed to load the software. Additionally, because the inability to travel, the IT departments at the installations had to install the instrumentation software themselves.

Distributed testing requires the test team and player units to embrace an innovative shift in both test preparation and execution. The player unit must take a more active role in the overall process because they transform from being just operators to operators and data collectors. Not only does the player unit have to continue executing its job using the new software, it also must be prepared to fill out test forms as system issues arise. The player unit must be trained on how to fill out the forms properly and testers must foster open communication with the unit to ensure proper data collection and test execution.

To accomplish this, the test unit must allot more time for data-collection training in addition to new-equipment training, which prepares test units to operate and maintain the system under test. The testing units must also identify and empower a test lead for direct coordination with Operational Test Command. The test lead will act as the single point of contact to reduce the workload on individual test participants.

A valid test is predicated on the test team's ability to capture, transmit and synthesize data. Distributed testing complicates these determinates by requiring more coordination and a longer lead time to execute. Moreover, because of the pandemic, the player unit office was minimally staffed and the test participants only came into the office as needed. This increased the time required to complete end-to-end data flow. To work around the test unit's restrictions and work schedule, the test team had to send a NIPR email to the site leads requesting that each test participant come to the office to complete each task. The site leads would gain approval from their leadership and then the test participant could come into the office and check their SIPR email. These requests would have been easily forecast in a scripted test. However, for a test on a live system, it created significant lead-time issues.

Additionally, the test team had issues with the test participants completing demographic forms and user surveys. This issue was alleviated by tracking the form count and attributing it to each site lead during daily test update briefs. However, the problem was not fully solved until the team sanitized the forms of all classified data and transmitted them over NIPR. When planning GFEBS-SA, the Operational Test Command did not anticipate the complexity of these issues and the effect they would have on the test length. The test team recommendation was to lengthen the test up to 25 percent to account for the extended lead time.

NETWORK AND SOFTWARE RELIABILITY

During normal testing, the data collectors would be co-located with the test unit and there would be minimal reliance on network connectivity. However, when

Table 1: Testing Comparison

Standard enterprise testing	Distributed testing during COVID-19 pandemic
• Data collectors at testing locations.	• Data collectors at central location.
• Data collectors complete all testing forms.	• Test participants complete all testing forms.
• Test team connected via NIPR; test sites connected via SIPR.	• All test participants and test team connected via SIPR.
• Meetings are conducted face to face.	• Virtual meetings utilizing defense software systems.
• Test participants in the office on normal daily work schedule.	• Test participants conduct as needed office manning.

COMPARE AND CONTRAST

This table compares standard enterprise testing with the distributed testing that occurred during the COVID-19 pandemic.



NEW AND IMPROVED
GFEBS, the system is utilized by Army civilians to process sensitive financial activities, now limits user access and restricts user visibility to authorized data only. After working for 24 years in legacy systems, Budget Analyst Cheryl Brophy now processes actions in the new GFEBS-SA system. (Photo by Samantha Tyler, U.S. Army Materiel Command)

conducting distributed testing, the testers are wholly dependent on the network infrastructure at their Fort Hood-based test headquarters. During the GFEBS-SA test, several network outages resulted in testing delays. Relying solely on SIPR and NIPR connectivity created a single point of failure for test execution. During normal test execution, in the event of an outage, the team would default to paper records and then transfer them when the network outages were resolved. To overcome outages and maintain connectivity, the team used mobile Wi-Fi for unclassified communication. However, these wireless communication devices had limited utility because they were restricted to NIPR use only, while the test was on a classified network. In addition to the network, the test team was dependent on several defense software systems. However, these systems were not always operational and their unreliability resulted in testing delays.

For GFEBS-SA, the team relied heavily on instrumentation to detect and record the required business transaction volume to satisfy Army Evaluation Center requirements. Elastic Stack was able to capture all transactions processing across the GFEBS-SA server. This efficient data collection method resulted in capturing more than 80 percent of total transitional data for the test. Taken in conjunction with the more detailed task performance forms, the data managers were able to provide the Army Evaluation Center with an accurate end-to-end process with sufficient data volume to evaluate the program.

CONCLUSION

Maintaining flexibility is imperative to successfully accomplishing a test, no matter what impediments may arise, even those imposed by COVID-19. The robust distributed testing process facilitated the Operational Test Command team's adaptability to best align resources with test objectives. The resulting shift to a distributed test ensured a safe environment for all those involved during the test. Distributed testing also provided the benefit of reduced cost for the taxpayer while meeting the necessary requirements to conduct a successful operational test.

In the future, if test teams want to use instrumentation on classified systems, they should hold weekly coordination meetings beginning six months before an operational test. This will ease concerns and allow things to proceed on schedule. Increasing the length of the test by up to 25 percent would account for potential network and systems downtime, and using secondary sources for capturing the data would ensure more than accurate data volume.

For more information, please contact Operational Test Command's public affairs officer Michael Novogradac at ***michael.m.novogradac.civ@mail.mil****, or go to* ***https://www.eis.army.mil/.***

MAJ. GRAHAM L. MULLINS is an acquisition officer (51A) currently serving as a test officer within the U.S. Army Operational Test Command, Fort Hood, Texas. He previously served as an assistant product manager within the Program Executive Office for Command Control Communications – Tactical, Aberdeen Proving Ground, Maryland. He holds an MBA from Vanderbilt University and a B.S. in mechanical engineering from North Carolina State University.

AMC DRIVES ON

Protecting our people and supplying the warfighter in crisis: Army Materiel Command keeps its focus on the mission.

by Col. Matthew Hoefer and Col. William Johnson



MOVE OUT
Soldiers from the U.S. Army Medical Materiel Center – Korea's (USAMMC-K) 563rd Medical Logistics Company load medical supplies onto a CH-47 helicopter with guidance from the 2ID/2CAB crew chief on March 24. (Photo by Shawn Hardiek, USAMMC-K)

Materiel and installation readiness are the reasons U.S. Army Materiel Command (AMC) exists. When the COVID-19 pandemic threatened our Soldiers, civilians and families, AMC leveraged the full force of the materiel enterprise in this fight. Our mission was clear—to protect our workforce and our families; combat and prevent the spread of the coronavirus; and accomplish our worldwide mission. AMC synchronizes, integrates and operationalizes the capabilities of our major subordinate commands, providing installation and materiel readiness to meet current, future and contingency requirements.

As our focus shifted to support the fight against COVID-19, AMC and its 10 major subordinate commands provided support to civil authorities through the Army and DOD's whole-of-government response to the virus.

AMC is doing its part to support the country's shared vision and fight against the spread of COVID-19 and has implemented several measures throughout its offices, garrisons, depots, ammunition plants and arsenals to protect our workforce while meeting mission requirements for the Army and the nation. These efforts can be summarized in three different categories: producing materiel, moving supplies and taking care of our people.

PRODUCING MATERIEL

Several of our organic industrial base facilities are producing, repairing and repurposing equipment, from sewing machines to manufacturing equipment, to augment the supply of personal protective equipment (PPE) and other potentially life-saving medical equipment. One example of this is the work being done by artisans at Joint Munitions Command, who have produced more than 70,000 cloth face coverings and 2,300 gallons of hand sanitizer, which are vital for Army personnel to continue their mission-essential work. Our workforce responded to the new demands while supporting Army top priorities.

While AMC is using existing organic industrial base facilities and equipment, AMC is also using additive manufacturing processes to design and 3D print essential parts and equipment.

AMC ASSETS

- Army Contracting Command (ACC)
- U.S. Army Financial Management Command (USAFMCOM)
- U.S. Army Security Assistance Command (USASAC)
- Army Sustainment Command (ASC)
- Aviation and Missile Command (AMCOM)
- Communications-Electronics Command (CECOM)
- Installation Management Command (IMCOM)
- Joint Munitions Command (JMC)
- Military Surface Deployment and Distribution Command (SDDC)
- Tank-automotive and Armaments Command (TACOM)

The Rock Island Arsenal – Joint Manufacturing and Technology Center's Advanced Manufacturing Center of Excellence will produce more than 1 million testing swabs on two printers by the end of the year for use by DOD personnel, thus reducing the demand for commercially available swabs that can be used for the general public.

Communications-Electronics Command (CECOM) has provided communications and electronics expertise to many emergency COVID-19 requests from different Army organizations. Through CECOM's subordinate Army Medical Logistics Command (AMLC), it has distributed PPE and essential medical supplies, including surgical masks, N95 respirator masks, gloves, surgical gowns, hand sanitizer, touchless infrared thermometers and specimen collection kits, to troops overseas in some of the hardest hit regions. Also, Tobyhanna Army Depot in Pennsylvania collaborated with AMLC medical maintenance technicians to establish the design requirements for producing the initial

Despite the pandemic, we are taking steps to make sure housing is clean, safe and ready for Soldiers and families.

prototypes, and then sourced the electronic components, to build power supplies for ventilators. Our artisans utilized their unique backgrounds to focus on what the country needed in response to the pandemic.

MOVING SUPPLIES

It is impossible to overstate the importance of getting supplies where they are needed, at the right time. TACOM's Sierra Army Depot in California is directly contributing to the COVID-19 response through the reception, storage and shipment of test kits and PPE. In late April, the depot began receiving millions of pieces of equipment, including gowns, surgical masks and face coverings, shoe covers, surgical caps, gloves, eye protection, face shields, hand sanitizer, thermometers, collection kits and test kits. Also, U.S. Army Aviation and Missile Command's Letterkenny Army Depot in Pennsylvania produced medical isolation gowns for a Pennsylvania-based health care system as part of a public-private partnership.

Military Surface Deployment and Distribution Command (SDDC) coordinated more than 200 line-haul, or freight, movements of critical medical units, equipment and supplies as part of the COVID-19 response. In addition, the command executed deployment and distribution operations at strategic seaports in the U.S. and overseas while also supporting sustainment requirements, often exceeding 1,000 supply containers per week, for the Defense Logistics Agency, Army and Air Force Exchange Service and Defense Commissary Agency. The SDDC workforce balanced COVID-19 missions with its support of DEFENDER-Europe 20, demonstrating its ability to project strategic readiness. DEFENDER-Europe 20 was designed as a deployment exercise to build strategic readiness in support of the U.S. National Defense Strategy and NATO deterrence objectives. Although the exercise was scaled back in response to COVID-19, SDDC moved more than 3,000 pieces of equipment through multiple seaports from the United States to Europe.

Contracting has also played a key role. The Army Contracting Command (ACC) awarded and oversaw contracts, completed thousands of contracting and government purchase card actions, and mobilized teams in support of the Federal Emergency Management Agency in 14 locations around the country, including New York, Boston, Philadelphia, Seattle, Dallas and other cities.

Outside of the U.S., AMC is also working with U.S. Army Security Assistance Command to provide medical supplies and materials to our allies and partners overseas. One example of this is a foreign military sales case that includes COVID-19-related protection materials, including masks and surgical gowns, for the Afghanistan National Army.



SAFETY FIRST

Hazel Ann Swan, supervisory program specialist at the Child Development Center (CDC), takes a child's temperature on July 24 during morning drop-off. CDCs at U.S. Army Garrison Wiesbaden in Germany have implemented safety measures as they provide care to the children of mission-critical personnel during the COVID-19 pandemic. (Photo by Emily Jennings, U.S. Army Garrison Wiesbaden)

TAKING CARE OF OUR PEOPLE

While supporting the COVID-19 fight, we continued taking care of our workforce and their families. Like many across the Army, our workforce has been using telework and work flexibilities. At the headquarters, we have maximized telework, so there are limited staff in the building. As in other Army organizations, those who work in the building are wearing face coverings in common areas and are maintaining social distance at all times.

Those working from home are able to have alternative work schedules, allowing flexibility for caregivers and parents to balance their work and home lives.

We have empowered our major subordinate commands to make similar decisions for their staff members, as each circumstance is different. By nature of the production lines and facilities within the organic industrial base, much of the artisan workforce already had been working within the recommended social distancing guidelines before the pandemic, allowing them to continue their critical operations and maintain a healthy working environment. Some facilities have implemented more steps to maintain a healthy working environment, such as teleworking to the maximum extent possible, adding or staggering shifts, installing Plexiglas barriers to work stations and issuing PPE to the workforce.

AMC continued to build Army readiness by supporting Soldier training at installations during the pandemic. Installation Management Command has continuously evaluated facility capacity and implemented mitigation strategies to ensure there is enough room to receive trainees and maintain adequate capacity for quarantine and isolation, as well as holding capacity for Soldiers who completed training and are awaiting transportation to their units or follow-on training locations.

AMC is doing its part to support the country's shared vision and fight against the spread of COVID-19.



AN OUNCE OF PREVENTION
A Crane Army Ammunition Activity employee labels containers of hand sanitizer. Crane Army collaborated with McAlester Army Ammunition Plant to develop a hand sanitizer production line to replenish stockpiles within DOD and alleviate pressure on the commercial market for hygiene products. (Photo by Mallory Haag, Crane Army Ammunition Activity)

Army Sustainment Command, together with ACC's Mission and Installation Contracting Command, used the Logistics Civil Augmentation Program to establish life support areas for the U.S. Army Training and Doctrine Command at Fort Lee, Virginia, and Fort Benning, Georgia, in early April. The life support areas provide overflow capacity, housing Army recruits and trainees because of COVID-19 movement restrictions. Typically, services include billeting, food service, showers, latrines, power generation, fresh water production, and gray and black water management. The camps reduced the risk of the trainees being exposed to COVID-19 before arrival at their new duty station.

Taking care of our people extends outside of the workspaces. AMC is responsible for four of the five quality-of-life priority initiatives set by the chief of staff of the Army: housing, child care, spouse employment and permanent change-of-station (PCS) moves. Despite the pandemic, we are taking steps to make sure housing is clean, safe and ready for Soldiers and families. The Army has recently hired 107 housing management specialists and established responsive 24-hour hotlines at each installation for housing issues. AMC and the Army also worked with private housing companies to improve housing. Those companies are on track to invest up to an additional $2.8 billion for Army housing over the next five years, and these investments will result in 3,800 new homes and nearly 18,000 renovations of homes at Army installations.

Outside of the home, roughly 67 percent of morale, welfare and recreation programs and services are open at full or reduced capacity, including child development

Through its subordinate Army Medical Logistics Command, CECOM has distributed PPE and essential medical supplies, including surgical masks, N95 respirator masks, gloves, surgical gowns, hand sanitizer, touchless infrared thermometers and specimen collection kits, to troops overseas in some of the hardest hit regions.

centers, school age centers, fitness centers and Army Community Services programs and offices. Also, Army leaders have joined DOD in continuing to address spouse employment during the pandemic through virtual hiring fairs and other initiatives. We will remain focused on caring for our people and improving quality of life, because our people are our No. 1 priority.

COVID-19 impacted permanent change-of-station moves, and our workforce helped Soldiers and their families to ensure a safe and seamless move. From health protection levels changing at garrisons and stay-at-home orders, to passport and visa delays, the Army met the challenges of the 2020 PCS season, safely completing more than 72,000 moves with quality assurance inspections on 97 percent of those moves. Also, to aid in the safe moves for service members, civilians and families, moving companies are ensuring that their employees wear face coverings, reducing crew sizes to enable social distancing, routinely cleaning frequently touched surfaces and practicing good hand hygiene.

The bottom line is that while AMC responds to the pandemic, the command is working to improve quality of life for Soldiers and their families, teaming with private housing companies to improve living conditions, maximizing the availability and affordability of child care and youth services, increasing opportunities and facilitating employment of Army spouses, and providing timely, quality service to Soldiers throughout the move process.

AMC also has not lost sight of its worldwide missions. Equipment fieldings impacted by COVID-19 happened virtually or were rescheduled. We did not close the doors on the organic industrial base. AMC continued to meet production requirements.

During this time, AMC also made strides in financial management. In October, it expanded its financial management mission as the U.S. Army Financial Management Command assumed the Army's military pay mission from the Defense Finance and Accounting Service.

CONCLUSION

While providing materiel and installation readiness, AMC has embraced the regionally aligned readiness and modernization model, or REARMM. AMC will work in conjunction with Army Forces Command to create the Modernization Displacement and Repair Site initiative, improving efficiencies, accelerating divestiture operations and allowing new equipment fielding across the Army to increase.

As we navigate the uncertainties of this pandemic, one thing is clear. AMC will keep doing what it does best—taking care of our people and supporting the warfighter.

*For more information, visit **www.amc.army.mil** to learn about AMC's mission and priorities.*

COL. MATTHEW HOEFER is an aerospace and occupational medicine physician currently assigned as the command surgeon for Army Materiel Command. He previously served as the command surgeon for the 1st Theater Sustainment Command. He holds a doctorate in osteopathic medicine from the Kansas City University of Medicine and Biosciences; a Master of Military Arts and Sciences from the U.S. Army Command and General Staff College; a Masters of Public Health from the University of Texas Medical Branch; and a B.A. in biology and pre-medicine with a minor in history, Saint John's University.

COL. WILLIAM JOHNSON serves as the AMC G-3 Chief of Operations Division. He previously served as deputy director for Installation Management Command – Pacific, Installation Management Command's regional command for the Indo-Pacific area of responsibility. His military education includes the Armor Officer Basic Course, Infantry Officer Advanced Course, Cavalry Leaders Course, Basic Airborne School and Pathfinder School. He holds a master's degree in military arts and sciences from the U.S. Air Command and Staff College and completed a Senior Service College Fellowship at Georgetown University.



SEWING SAFELY
Pine Bluff Arsenal textile production operator Tyronza Hudson sews protective face masks in support of COVID-19 requirements to protect the force. (Photo by Rachel Selby, Pine Bluff Arsenal)



UNEXPECTED, BUT NOT UNREADY

JMC produces masks and sanitizer in battle against COVID-19.

by JoEtta I. Fisher

In January 2020, the World Health Organization and the U.S. secretary of health and human services declared public health emergencies in response to the emergence of the COVID-19 pandemic. The U.S. Centers for Disease Control and Prevention eventually issued a list of precautions, which included washing hands frequently, using hand sanitizer and wearing cloth masks to cover the nose and mouth. In April, the U.S. secretary of defense ordered all people on military property to wear such masks. This order raised immediate issues, with the United States facing a nationwide shortage of personal protective equipment (PPE).

Joint Munitions Command's (JMC) solution was simple: task its government-owned, government-operated facilities with a new mission, making PPE. JMC installations immediately began manufacturing cloth masks and hand sanitizer for military personnel, civilian employees and contractors within JMC, Army Materiel Command and DOD, thereby reducing the need to acquire these PPE items from the already restricted open market.

"To lay the groundwork to execute the mission, headquarters JMC assembled a team with experience in all needed areas and worked with counterparts at Pine Bluff Arsenal [Arkansas], Crane Army Ammunition Activity [Indiana], and McAlester Army Ammunition Plant [Oklahoma]," explained Caleb Conley, lead industrial specialist in JMC's government-owned, contractor-operated Directorate Facility Investments Division. "The installations rose to the occasion. They developed ways to meet regulatory requirements, and worked with headquarters JMC to develop a final plan."

REMOTELY TOGETHER

Assembling the team with urgency during a pandemic presented unique difficulties. The team included eight members drawn from various departments at headquarters JMC, including facilities, finance, quality assurance and logistics. Because of the pandemic, the team worked remotely, coordinating with on-site personnel at Crane, Pine Bluff and McAlester to set up production lines, secure needed materials for each site and arrange shipment of the final products.

Within two days of the secretary of defense's April order, Pine Bluff started designing, testing and producing face masks by adapting an existing mission that produced chemical patient protective wrap (to prevent exposure to contamination), integrated footwear (a protective sock system worn under normal combat footwear), and neck dams (a chemical and biological defense garment with impregnated carbon material). Using the equipment on hand, the Pine Bluff team rapidly acquired the needed material and started production.

"I am reminded daily that Pine Bluff has a superb team of employees that accomplishes its mission effectively," said Col. Patrick Daulton, commander of Pine Bluff Arsenal. "This expertise was on display as team Pine Bluff



NEXT, PLEASE
McAlester Army Ammunition Plant production workers use existing equipment to produce critically needed hand sanitizer for distribution to points of need in support of the COVID-19 response while continuing to meet ammunition readiness for the joint force. (Photo by Gideon Rogers, McAlester Army Ammunition Plant)



BOTTLE IT UP
Assembly workers pour hand sanitizer into plastic containers at McAlester Army Ammunition Plant during the packaging phase. After packaging, it is shipped to points of need in support of COVID-19 prevention. (Photo by Gideon Rogers, McAlester Army Ammunition Plant)

produced cloth face coverings for the JMC enterprise to ensure employees were protected from COVID-19 pandemic. Pine Bluff still maintained the same level of dedication and support, while storing and producing quality ammunition for America's joint warfighter."

The resulting masks include a breathable, water-resistant outer layer, a filtered middle layer and a cotton-blend inner layer, providing a comfortable barrier to airborne particulates. Working remotely, an eight-person team at Pine Bluff processed more than 90 orders for 77,259 cloth face coverings. JMC filled these equipment orders with coordinating help from Army Materiel Command, Deputy Chief of Staff for Integration & Synchronization (AMC G3/4), and shipped to sites in the U.S. and overseas, providing personnel with the required protective equipment.

"When we say that people are our strongest asset, it doesn't just apply to our day-to-day mission. It applies to times like these," said Col. Stephen P. Dondero, commander of Crane Army Ammunition Activity. "Since the beginning of the coronavirus pandemic, our employees have adapted to make sure we still provide munitions to our men and women on the front lines."

CLEAN AND SAFE

JMC also established a team of experts to handle production and transportation of hand sanitizer. McAlester and Crane led this production effort. JMC worked with the site program managers to acquire raw material supplies and coordinate customer orders for the hand sanitizer. Crane experts coordinated directly with private hand sanitizer companies to ensure the use of all baseline ingredients necessary for effective hand sanitizer—isopropyl alcohol,

glycerin, hydrogen peroxide, and purified water. McAlester and Crane produced more than 2,820 gallons of hand sanitizer and completed more than 62 orders for JMC, AMC, the United States Military Academy at West Point and other Army units with urgent requirements.

"The dedicated and professional workforce that exists across the organic industrial base stepped up once again to answer the nation's call," said Col. Shane E. Upton, commander of McAlester Army Ammunition Plant. "From providing munitions to the joint warfighter while operating in in a COVID environment, to adapting rapidly to produce critical protective items for our nation in a time of need, our people continue to deliver."

CONCLUSION

Thanks to the proactive and timely efforts of its expert teams, JMC is working to create safer work environments for its personnel and units throughout DOD, ensuring the continuation of mission-essential operations across the United States and around the world.

JOETTA I. FISHER serves as the executive director for ammunition and the deputy to the commander for the Joint Munitions Command. Fisher is the organization's senior civilian responsible for the command's mission to distribute, store, demilitarize and produce ammunition for joint services and coalition partners to sustain worldwide readiness. She also serves as the Ammunition Management (CP-33) Career Program Representative for JMC. Before this position, Fisher served as the deputy for the Munitions and Logistics Readiness Center at JMC.



ON TOUR

Jason Fullen, center, project coordinator with Pine Bluff Arsenal's textile production, gives a tour of sewing operations to Col. Gavin Gardner, JMC commander, during a visit in July. Dee Webb, left, sews protective face masks in support of COVID-19 requirements to protect the force. (Photo by Hugh Morgan, Pine Bluff Arsenal)



READY TO GO

Pallets of hand sanitizer produced at McAlester Army Ammunition Plant are staged for shipment and distribution to protect the joint force. (Photo by Gideon Rogers, McAlester Army Ammunition Plant)

RESEARCH ABROAD IN THE TIME OF COVID

A U.S. Army scientist's plans for her exchange program assignment in the Czech Republic get upended by the pandemic.

by Cathy VanderMaarel

Moving to a foreign country can be a difficult and anxiety-inducing experience because of language barriers, different customs, new colleagues and many other factors. A global pandemic isn't usually one of those—until now.

Army research chemist Dr. Irene MacAllister arrived in the Czech Republic for a yearlong tour on Feb. 19, just weeks before the country declared a state of emergency in response to the spread of the coronavirus throughout Europe.

A BUMPY LANDING

MacAllister spent a brief time handling some administrative matters at the U.S. Embassy in Prague before heading to Hradec Králové, about 70 miles east of the capital, for her assignment on the faculty of military health sciences at the Czech Republic's University of Defense.

"Luckily, I had arranged a number of things before leaving the U.S., and all the intense planning—and to some degree 'over-planning'—before my actual arrival paid off," MacAllister said. "I have incredibly supportive Czech peers, including one colleague who had had a past research assignment in the U.S. and who knows exactly what it's like to arrive alone in a foreign country. She had prearranged an apartment for me which turned to be in an ideal location."

But even over-planning didn't prepare MacAllister for what the pandemic would bring. She's the first Army employee to participate in the Engineer and Scientist Exchange Program in the Czech Republic, and the only American at the facility



UNEXPECTED FRIEND
Dr. Irene MacAllister enjoys riding her bicycle in the Hradec Forest as a break from her research on the development of a vaccine against the bacterium Francisella tularensis. (Photo courtesy of MacAllister)

where she's assigned. In the early days, she wasn't sure if she should work according to the U.S. Army Combat Capabilities Development Command – Atlantic protocols for teleworking or those of the university where she was assigned. She didn't know if she'd be allowed to move into that perfect apartment. She didn't even know if she'd be recalled to the U.S. and have to completely give up the opportunity to work abroad for the year.

THE BACKSTORY

When the U.S. Army Engineer Research and Development Center was tasked to identify potential candidates for an exchange program with the Czech Republic, the request included three different position descriptions relating to immunology, microbiology, proteomics, gene editing and bioinformatics, one of which seemed tailor-fit to her skills. "I was very excited about the prospect of reinvigorating old skills, learning new procedures and techniques and getting back to full-time laboratory work," said MacAllister.

DR. MACALLISTER

Dr. Irene MacAllister is a research chemist at the Construction Engineering Research Laboratory within the U.S. Army's Engineer Research and Development Center (ERDC) located in Champaign, Illinois. She holds a Ph.D. in biochemistry from the University of Illinois and a B.S. in biochemistry from Beloit College. She has completed three levels of the Army Management Staff College Education System, is a graduate of the ERDC Leadership Development Program Levels 1 and 2 and is an alumnus of the Emerging Leaders Group program.

Her research focus during the exchange is laying the groundwork for the future development of a vaccine against the highly lethal bacterium Francisella tularensis for both the warfighter and civilian populations, in the event it is weaponized and deployed.

Not only did it seem the work would suit her, but she was excited to live in Europe again and for the opportunity to travel. Having grown up in Lampertheim, Germany, and having a German mother, MacAllister is fluent in the language and had made plans for her octogenarian parents to visit from Illinois.

THE IMPACT

Despite the restrictions and uncertainty, MacAllister was eventually able to move into the apartment and begin her research in Hradec Králové. She lives just across the street from a forest, which, she said, "was a godsend during the initial phase of the state of emergency, during which I teleworked and admit I was getting a bit of cabin fever." Her Czech supervisor ensured she was included in group picnics and other outdoor activities to stave off any feelings of isolation.

In late April, MacAllister was finally able to start working in the lab instead of teleworking from her 400-square-foot apartment. Since then, she has noticed more similarities with her Czech colleagues than differences. "Most government researchers—U.S. and Czech—tend to grumble, at least a little bit, about administrative activities which we see as distractions from actually doing the fun stuff," said MacAllister. She also noted a shared dedication to the research mission.

Dr. Klára Kubelková, a captain in the Czech Army, was part of the team that selected MacAllister for the exchange, made arrangements for her arrival, and works alongside her regularly. "Dr. MacAllister provides valuable advice in solving the scientific questions in selected projects and provides her personal opinions on the studied issues," Kubelková said. "It is also a great benefit for the staff of the department, who have the opportunity to communicate with the researcher in English."

"Cooperation through military exchanges improves allied readiness and solidifies our strong military-to-military relationship."

While the Czech facility has hosted exchange scientists before, those programs were from other European countries and for a much shorter time than this one, according to Professor Jiri Stulík, who was responsible for preparing MacAllister's scientific program at the university. "Previously, we had collaboration with people from Fort Detrick [Maryland] funded by [the Defense Threat Reduction Agency], so we are used to work[ing] with scientists from [the] USA," Stulík said. "I think this program is very useful, as any other program concerning the exchange of scientists from abroad. Definitely both sides gain new experiences and there is a good chance for further scientific collaboration."



FRESH AIR

MacAllister enjoys some time outside the lab running in the Hradec Forest across from her apartment near the research center at the Czech Republic's University of Defense, where she is working as part of the U.S. Army's Engineer and Scientist Exchange Program. (Photo courtesy of MacAllister)

As restrictions started lifting, MacAllister was able to do more than just go to work or walk in the forest, and she found so many others in town to be just as helpful. She had hoped her German and English fluencies would help her learn Czech, but unfortunately it doesn't resemble the other languages at all. She's finding, though, that people are incredibly patient and willing to help when she needs it. "I learned to say, 'I don't speak Czech. Do you speak English or German?' in Czech," MacAllister said of her efforts to reach out. When she hears other Americans or native English speakers also living in the college town, she takes some time to chat with them.

LOOKING AHEAD

During a press conference in August, Czech Prime Minister Andrej Babis said he and U.S. Secretary of State Mike Pompeo had discussed scientists and defense cooperation. "We can cooperate in science and development. We have great scientists that are also active in the United States. So we have excellent scientists and I see a great potential," Babis said. MacAllister, as the first Army scientist in Czech Republic under this exchange program, is laying the groundwork for that future cooperation.

The U.S. Embassy in Prague has recognized the importance of MacAllister's exchange and of the program. "We are delighted that she is cooperating with outstanding Czech scientists at the University of Defense Research Laboratory in Hradec Králové," said embassy spokesman Griffin Rozell. "Her work in infectious diseases is timely and her presence has been noted and appreciated at the highest levels of the Czech government. We look forward to continuing the exchange program by building on this experience and also hope to facilitate an exchange for a Czech researcher to the United States. Cooperation through military exchanges improves allied readiness and solidifies our strong military-to-military relationship."

In addition to the scientific outcomes, MacAllister knows the potential for her exchange to have an even bigger impact by reinforcing the enduring U.S. relationship with the Czech Republic—which is recognized internationally for its expertise in chemical, biological, radiological and nuclear defense—and facilitating the future placement of Czech scientists in U.S. Department of Defense research facilities. In hopes of paving the way for future U.S. Army exchange personnel, MacAllister will take the lessons learned from her exchange to help the U.S. Embassy in Prague; the Science and Technology Attaché at the Czech Republic Embassy in Washington; U.S. Army Combat Capabilities Development Command – Atlantic; and the Office of the Deputy Assistant

Her Czech supervisor ensured she was included in group picnics and other outdoor activities to stave off any feelings of isolation.

STATE OF EMERGENCY

The Czech Republic's initial state of emergency on March 13 restricted:

- All public and private cultural, sports, social, religious, educational and other events with more than 30 people.
- Operation of catering services in shopping centers.
- Public access to gyms, swimming pools, wellness services and saunas, public libraries and galleries.
- Entry into the territory of the Czech Republic for all foreigners coming from risk areas, with the exception of foreigners staying with a temporary stay of more than 90 days or permanent residence there, unless their entry is in the Czech Republic's interest.

(Source: The government of the Czech Republic: **https://www.vlada.cz/cz/media-centrum/**)



WORKING FOR THE FUTURE

The work MacAllister does as part of the U.S. Army's Engineer and Scientist Exchange Program improves the military-to-military relationship between the U.S. and her host country. (Photo courtesy of Czech Republic's University of Defense)

Secretary of the Army for Defense Exports and Cooperation develop standard procedures for more U.S. Army research scientists to take part in the Engineer and Scientist Exchange Program with Czech Republic's Defense Ministry.

MacAllister has approval to extend her exchange through June 2021. Though her parents likely won't be able to visit, and the cultural experiences aren't exactly what she thought they would be, she said this experience is "one that I will think of fondly (despite the pandemic) for many years to come, and I would encourage everyone to seek out an ESEP assignment."

CATHY VANDERMAAREL is a career Army public affairs civilian, having started in the field in 2003. She has served as the public affairs specialist on the strategic communication team at DASA (DE&C) since March 2020. She holds a Master of Public Administration from Norwich University, a B.A. in communications from the University of South Carolina, and has earned the Intermediate Certification in Security Cooperation Execution Support Management.

THE ENGINEER AND SCIENCE EXCHANGE PROGRAM (ESEP):

A government-to-government effort aimed at increasing international cooperation between the U.S. and its allies in military research.

The only DOD program that gives civilian scientists and engineers the opportunity to work in a foreign partner's facilities side by side with experts around the world.

Army ESEP:

- Deputy Assistant Secretary of the Army for Defense exports and Cooperation manages the program.
- First exchange was with Germany in 1963.
- Agreements with 16 countries.
- Participants come from the U.S. Combat Capabilities Development Command centers and Army Research Laboratory, U.S. Army Corps of Engineers Engineer Research and Development Center, U.S. Army Test and Evaluation Center, and U.S. Army Medical Research and Development Command.
- More than 70 participants in the last 15 years.

Early- to mid-career U.S. Army scientists and engineers in Career Program 16 grades GS 12-14, or Acquisition Demo equivalent, can apply for the Engineer and Scientist Exchange Program's career-broadening work assignments. Candidates should have a bachelor's degree and a minimum of four years of technical experience in industry, military or federal civilian service. For more information on the program and upcoming application deadlines, email **dasadec.army@mail.mil**.

Her research focus during the exchange is laying the groundwork for the future development of a vaccine against the highly lethal bacterium Francisella tularensis.



ROBIN L. MILLER

COMMAND/ORGANIZATION: U.S. Army Aviation and Missile Command Logistics Center

TITLE: Branch chief, Initial Provisioning

YEARS OF SERVICE IN WORKFORCE: 17

DAWIA CERTIFICATIONS: Level III in life cycle logistics, Level II in program management, Level I in production, quality and manufacturing, Lean Six Sigma Green Belt certification

EDUCATION: MBA in business, Texas A&M University; B.A. in computer information systems and accounting, Davenport University

AWARDS: Nominated for ASA(ALT) Lean Six Sigma Excellence Awards Program, Cargo PMO Exceptional Service Award, Certificate of Appreciation Team Award, numerous performance awards

LEADERSHIP THROUGH INSPIRATION

Some people respond to adversity with bitterness or anger. Others, with frustration or sadness. For Robin Miller, that just doesn't feel right. "We have to learn that it's not all about us," she said. "I tell people all the time, it's my motto, be the inspiration that you seek." There was a time in her Army career when she struggled to find guidance and direction, and that memory sticks with her. "There were days when I wanted to say, 'This government thing is not for me,' " she said. Instead of giving up, though, she dug deeper. "What I decided is that when I see others needing help, I'm going to help them." Since then, Miller has built a reputation as a leader, a mentor and someone who always sees the potential in others.

She entered the civilian workforce through the Army Materiel Command (AMC) Fellows Program. At the time, Miller was a recent college graduate with two young children, living in Flint, Michigan, and struggling to find work in the automotive industry. Her father, who worked at U.S. Army Tank-automotive and Armaments Command, suggested that she apply, and the rest is history. The five-year program, which was started in 2000, targeted young professionals with certain undergraduate degrees and the willingness to relocate. Candidates would move to Texarkana, Texas, where they would complete a graduate degree before beginning a series of rotational, on-the-job training assignments over the next 47 months. Through the course of the program, fellows would advance from GS-7 to GS-13. When Miller had the chance to go, she knew it was an opportunity she couldn't pass up. "I knew that was my way out," she said. "That changed the trajectory of my life."

However, making that first move from Flint to Texarkana was no small task. "I had small children, and was recently divorced," Miller said. So her mother stepped in. "She moved with me, to make sure I would be successful, and made sure my children were taken care of while I pursued my master's degree."

And Miller hasn't stopped since. After finishing her MBA in Texas, she completed the developmental phase of her fellowship, rotating between assignments at DOD and other federal offices (even NASA!) at Redstone Arsenal, Alabama. There were challenges along the way, and Miller said she had a lot to learn, but she knows she made the right choice. "It catapulted me," she said. "It changed my life. I could potentially still be in Michigan, struggling, but [the fellows program] allowed me to take care of my family."

In the fellows program, she chose to pursue a career in logistics. Her first acquisition position was item manager for the Army's CH-47 helicopter. "I enjoyed managing parts, organizing requirements for procurement and ensuring parts availability for the Soldiers," she said. Today, Miller is the branch chief for Initial Provisioning at the



IDEAL TRAINING
Miller and the fiscal year 2019 Inspiring and Developing Excellence in Acquisition Leaders program cohort at Fort Belvoir, Virginia, on July 10, 2019. (Photo by Tara Clements, Program Executive Office for Enterprise Information Systems)

U.S. Army Aviation and Missile Command (AMCOM) Logistics Center at Redstone Arsenal. The AMCOM Logistics Center provides worldwide readiness support for aviation and missile weapon systems, from the earliest stages of weapon system development through demilitarization. Its logisticians work directly with program managers to influence system designs with a focus on total life cycle system sustainment and achieving cost-wise readiness. As Initial Provisioning branch chief, Miller leads a team of government logisticians who analyze, develop and maintain provisioning data for AMCOM weapon systems. "Provisioning is the process of determining spares, repair parts, special tools, test equipment and support equipment that are required to support and maintain an end item," she explained.

Despite the technicality of the job, Miller said the bulk of her time in the office revolves around so-called "soft skills." "My job is all about helping other people," she said. As an Army civilian, her No. 1 priority is supporting Soldiers, but she is always looking out for her team as well. "I always tell my employees, 'If you don't feel good, if things are not going OK with you, then I can't expect you to come in to this building and take care of work. You have to take care of yourself first.' " She is quick to offer a listening ear or share advice when asked, and she is eager to help others discover the inspiration that she has found in life. "I think that's what people often need—they just need to be given an opportunity," Miller said.

"We have to learn that it's not all about us, I tell people all the time, be the inspiration that you seek."

A self-professed homebody by nature, Miller enjoys spending time with family, praise-dancing at church, cooking (especially vegan dishes) and landscaping in her free time—no, not gardening, landscaping. "My mother used to do professional landscaping," she explained. "As a child, I learned how to do all of that." She isn't intimidated by laying sod or brick, or tackling overgrown shrubs. "My yard looks better than most of the men on my block," she chuckled, "and I have more tools than they do, too!" But her natural confidence belies a professional lesson she is still trying to absorb. "I have learned that people often think more highly of me than I think of myself," she said. "I always believe in others, so that lesson comes full circle." Miller has more than proven herself as a leader and a logistician, and she hopes to help others find their opportunities for success, too.

—ELLEN SUMMEY



NEW NAVY SWABS

A staff member at Portsmouth Navy Shipyard checks on the production of nasopharyngeal swabs. USAMRDC's Additive Manufacturing Working Group was stood up to streamline the process assisting all DOD additive manufacturers interested in organically producing personal protective equipment and other FDA-regulated devices. (Photo by Jim Cleveland, U.S. Navy)

CREATING SUCCESS OUT OF NECESSITY

USAMRDC's Additive Manufacturing Working Group streamlines the process for additive manufacturers interested in producing PPE and other devices.

by Leigh Anne Alexander and Kenneth L. Wood

All across our nation, most would agree that March 2020 was an odd time, full of unknowns and uncertainty. As we awaited the start of springtime, Americans were beginning to learn about COVID-19, which would soon redefine our "normal" lives. Citizens were asked to shelter in place, don masks and pause their lives for an undetermined amount of time. It was hard to imagine then that COVID-19 would still be affecting the entire world as we moved into the fall of 2020.

For the men and women of the U.S. Army Medical Materiel Development Activity (USAMMDA), our mission to develop and deliver quality medical capabilities in support of our service members simply could not stop. As a subordinate command of the U.S. Army Medical Research and Development Command (USAMRDC), USAMMDA its efforts to develop drugs, vaccines, devices, blood products and medical equipment for our nation's warfighters. However, COVID-19 posed a threat not only to our military forces, but to the world's population.

In an instant, personal protective equipment (PPE) became a household phrase, describing the items not only required for health care workers' safety, but now for the average person to keep themselves and their communities healthy. Supplies of masks, respirators, gloves, face shields, goggles and hand sanitizer could not keep up with the demand. In addition, sample collection kits for COVID-19 testing were in very short supply—namely, the nasopharyngeal swabs and viral transport media that comprise the kit. Fortunately, our team's expertise in Army acquisition and product management could help with this problem—in the form of the USAMRDC's Additive Manufacturing Working Group—but we didn't realize then that we were going to turn our medical acquisition paradigm on its head.

NO SUPPLY, GREAT DEMAND

DOD medical acquisition traditionally relies on private industry for full-scale production of medical products because of the complexity of maintaining the necessary U.S. Food and Drug Administration (FDA)-compliant manufacturing processes. However, the suddenness and the scale of the pandemic—combined with the offshoring of medical supply chains—left DOD and the nation grappling with shortages in PPE and other critical medical supplies as COVID-19 spread across the United States. The U.S. Department of Health and Human Services and the Federal Emergency Management Agency took the lead to address these shortages, with DOD providing support. The government turned to the DOD organic industrial base, which has resource, acquisition, sustainment, manufacturing and maintenance professionals throughout depots, arsenals and ammunition plants to sustain life-cycle readiness of military systems. The organic industrial base enterprise and its suppliers were used to leverage their unique capabilities to make PPE and other supplies in an effort to increase manufacturing and to alleviate these critical shortages. Managed by U.S. Army Materiel Command, the organic industrial

base consists of 26 depots, arsenals and ammunition plants that manufacture and reset Army equipment.

Many government organizations have 3D printers used in the additive manufacturing of parts or tool applications throughout DOD. The DOD organic industrial base also uses additive manufacturing to support prototyping and the sustainment of military components for aviation and other vital military systems. There has been a recent emphasis within the government to use additive manufacturing to maintain the readiness of our military systems, but never before had full-scale production of medical products been part of that equation.

The public health emergency suddenly placed the ability to secure medical supplies at the fore of a different type of battle and prompted an entirely new way of thinking. There were skilled and dedicated workers across DOD at government facilities, but none had experience manufacturing a medical device. Nevertheless, they were eager to help. Organizations like the U.S. Army Tank-automotive and Armaments Command's (TACOM) Rock Island Arsenal started asking how they could use their extensive manufacturing capabilities to produce medical devices and who could point them in the right direction. Ultimately, they were pointed in the direction of Fort Detrick, Maryland, and USAMMDA.

ANSWERING THE CALL

One Tuesday evening last April, during a phone call with Dr. Ana-Claire Meyer, the senior clinical adviser in USAMRDC's Office of the Principal Assistant for Acquisition, Meyer mentioned fielding calls from teams across DOD requesting advice as they worked to respond to urgent supply shortages in hand sanitizer, PPE and sample collection kits for COVID-19 testing. She recognized that the DOD organic industrial base needed guidance on how to navigate the regulatory hurdles and meet the rapidly changing FDA guidance to mitigate critical shortages during the public health emergency.

In a single weekend, she had worked closely with the Naval Air (NAVAIR) Systems Command and TACOM to provide face coverings urgently needed across the fleet to enable full compliance with FDA regulations, which are not service- or military-specific. To implement these processes across DOD, she knew she needed assistance.

By combining our forces, DOD was able to organically manufacture and supply a medical product—for the first time ever.

She thought our team at the Warfighter Expeditionary Medicine and Treatment Project Management Office may be able to help organize the effort across the enterprise.

"We have teams across the DOD with all of these great manufacturing capabilities that want to help in the COVID effort, but none of them have experience with medical," she said. "We really need a team at USAMRDC that can help guide them through the regulatory and medical product development process, and make sure that their items are safe, effective and compliant."

Our team fully understands what it takes to develop and produce an FDA-approved medical item. Not only is the process long, it is also quite complicated. As its name might suggest, the Food and Drug Administration regulates not only food, but also drugs, biologics, vaccines and medical devices to protect public health. The agency ensures the safety, efficacy and quality of these products. Our team at Fort Detrick was ready and eager to help, and it took just one phone call to pull the right players together.

Within a few days, the Additive Manufacturing Working Group was born. The primary intent of the working group is to expedite the delivery of medical products in short supply during the pandemic through two approaches:

- Using the DOD organic industrial base to manufacture medical materiel.
- Ensuring the quality and compliance of medical materiel procurements from alternative suppliers in the face of critical supply shortages.

Led by USAMMDA's Warfighter Expeditionary Medicine and Treatment Project Management Office, the working group sought to help produce not only face masks, but also 3D-printed nasal swabs, face shields, protective barrier enclosures and N95 respirator masks.

Comprising 24 professionals across the USAMRDC enterprise with programmatic, regulatory, agreements, clinical, legal and intellectual property expertise, the working group has been a force multiplier for DOD. To date, it has streamlined



GANG'S ALL HERE

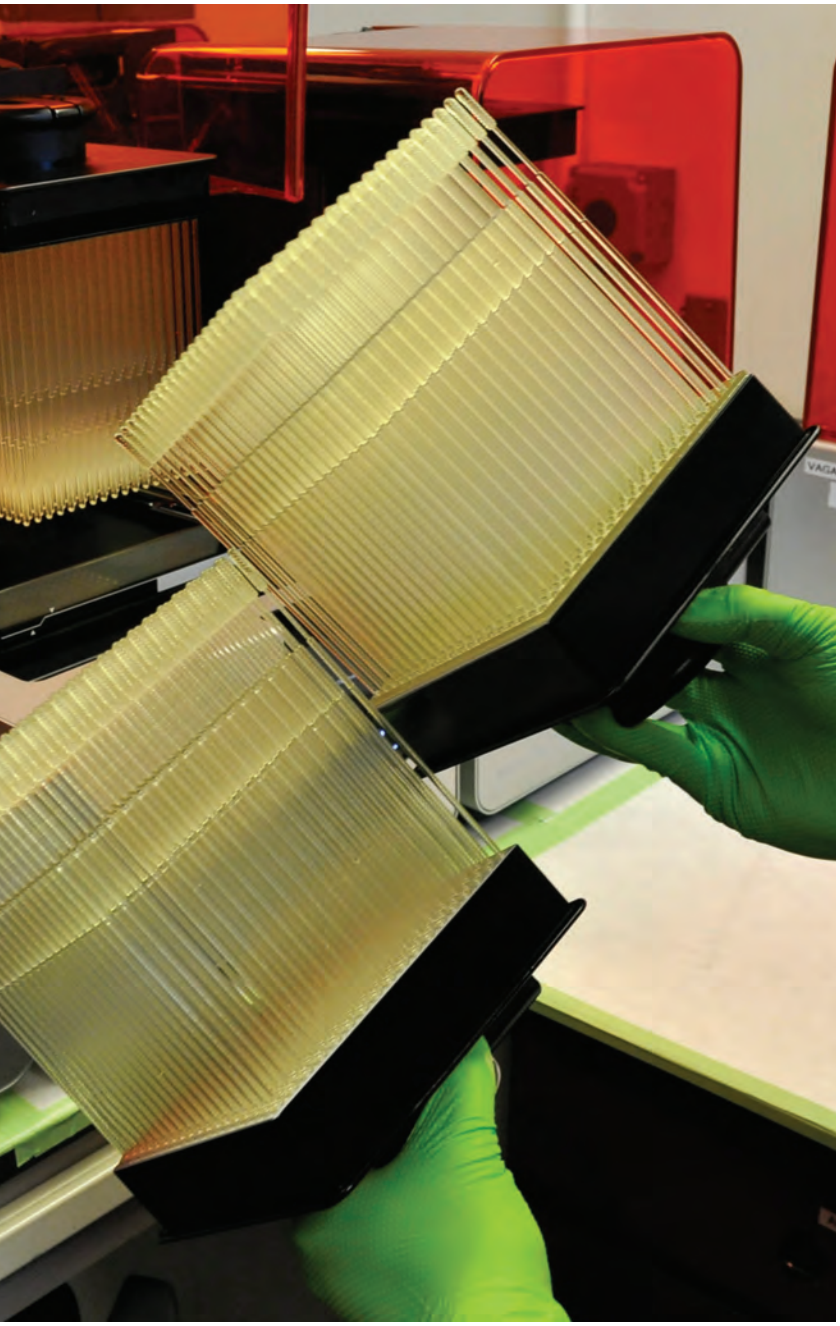
Members of the USAMRDC Additive Manufacturing Working Group display their team shirts from various locations during the COVID-19 global pandemic. Top row: Daniel Patterson, Annette Lozen, Ed Flinn, Karen Kunkler, Ryan Ash, Jen Rebelez and James Valicenti. Middle row: Army Lt. Col. Dave Shoemaker, Air Force Maj. Scott Baker, Kristin Jones Maia, Dr. Chandar Thakur, Dr. Ana-Claire Meyer, Ken Wood and Leigh Anne Alexander. Bottom row: Randal Besse, Air Force Maj. Daniel Williams, Judy Holian, Steve Monroe, Christine Parker, Army Maj. Sarah Sanjakdar, Katie Hagen Perkins and Ed Brown. (Image courtesy of Leigh Anne Alexander)

the acquisition, testing and regulatory processes to adjudicate 88 requests from DOD partners, including the Army, Navy, Air Force, Marines, Coast Guard, Defense Logistics Agency and the Defense Health Agency. Effectively, these efforts have mobilized DOD assets that are not typically employed in the medical space to manufacture safe, effective and compliant products for the prevention and detection of COVID-19.

Our approach to medical product development was to maximize the use of existing government resources. The USAMRDC Additive Manufacturing Working Group has all of the acquisition and regulatory expertise to manage a program, but it still requires partners to develop, test and manufacture the critical supplies needed. In some instances, we leveraged the intellectual property or clinical data from industry and academia to support production and distribution of the DOD-manufactured items. Any DOD partner seeking to produce a nasopharyngeal swab or N95 respirator could consult with our team, and our processes could quickly take them from prototype to production—all while properly engaging the FDA through our existing relationship with the agency.

BECOMING THE SUPPLY CHAIN

Working with a budget of roughly $2 million from the Defense Health Agency, in a very short time, we have been able to conserve critical resources and do a



NOSE DIVER
The 59th Medical Wing and Portsmouth Navy Shipyard, where these nasopharyngeal swabs were manufactured, recently obtained FDA enforcement discretion to additively manufacture and distribute nasopharyngeal swabs for DOD-wide use during the COVID-19 public health emergency. Portsmouth Navy Shipyard has the ability to produce about 280,000 swabs per month, and the 59th Medical Wing can produce about 10,000 swabs per month. (Photo by Jim Cleveland, U.S. Navy)

great deal of work with our partner organizations. We have been accomplishing things in weeks that usually take years by thinking creatively on how to do a lot with a little, such as building new pathways within the existing system to secure more partners within DOD, where before we would have focused primarily on leveraging our commercial resources. The strain on the entire nation has pushed us to look inward.

Because of the knowledge and expertise within USAMRDC, we have been able to close a huge gap between the organic industrial base and the medical community. The organic industrial base typically does not produce FDA-regulated medical products. Its focus has been on the sustainment or replacement of parts no longer procurable, rather than the development of a new item to supplement non-procurable items or to alleviate a constrained supply chain. No other team or organization in DOD had the mission experience to marry this all together.

There are currently two sites up and running that are producing the 3D-printed swabs: the Air Force's 59th Medical Wing at Joint Base San Antonio-Lackland, Texas, and Portsmouth Navy Shipyard in Virginia. The Army's Rock Island Arsenal in Illinois is leading the charge from the organic industrial base, receiving enforcement discretion to distribute nonsterilized swabs to military treatment facilities that can sterilize the swabs onsite. There are five more sites working to get online in the very near future, with the ultimate goal of centralizing sterilization and distribution through the DOD supply chain.

The capacity to produce these items directly supports the readiness of warfighters. Novel N95 respirator prototypes from four different DOD agencies and one industry partner are currently being evaluated through an agreement at the U.S. Army Combat Capabilities Development Command Chemical Biological Center at Aberdeen Proving Ground, Maryland. These particular N95 respirators have an innovative design and are produced via a unique manufacturing process. If any of these prototypes prove successful, DOD could have its own source of respirators, alleviating shortages in our national response efforts.

THE ROAD AHEAD

The military is called upon to solve problems every day, but this problem set, in particular, required a different type of team that had never worked together before. Meyer effectively threaded the needle, weaving together key stakeholders from the services' additive manufacturing, medical, testing, logistics and regulatory communities. The "silver lining" of this pandemic has been the opportunity to work with a large group of dedicated, passionate

The public health emergency suddenly placed the ability to secure medical supplies at the fore of a different type of battle and prompted an entirely new way of thinking.

and creative individuals in government, industry and academia to put together all of the puzzle pieces in helping to combat COVID-19—from the ground up.

Manufacturers in the DOD organic industrial base have been able to use their existing equipment and turn over their machines to make these critical items. They had the equipment and our team had the medical product development and regulatory expertise. By combining our forces, DOD was able to organically manufacture and supply a medical product—for the first time ever.

In the course of only a few months, the working group has learned much about what can be accomplished by working together in the face of adversity. Our unique team of military, civilian and contract support personnel is living proof that anything is possible with the right plan in place. We continue to work around the clock to ensure medical products are moving toward distribution, when and where they are needed, to battle this worldwide pandemic.

THE FUTURE FIGHT

The lessons we are learning in responding to COVID-19 directly translate to the Army's multidomain operations concept, where logistical supply chains will be degraded during large-scale combat operations. The success of the working group thus far has provided an opportunity to assess which equipment and capabilities can be force multipliers in our future operating environment. In our response to this crisis, we have been able to break down boundaries, bring together diverse resources and competencies from different organizations, and apply them in a manner to drive innovation and collaborative teaming for a DOD enterprise solution. We have come to learn that to control the supply chain, you must become the supply chain.

Ultimately, the COVID pandemic has highlighted the vulnerability of DOD's operational readiness because of the globalization of the medical supply chain. Future conflicts with near-peer adversaries will present even greater challenges to continuity of global supply chains. As we manage supply chains for our critical weapon systems, the Army must control the supply chain that ensures the health and readiness of our operational forces. Building an enduring and sustainable capability for production of critical medical supplies within the Army and with its domestic suppliers, is key to the DOD organic industrial base readiness mission.

For more information on the Warfighter Expeditionary Medicine and Treatment Project Management Office and other projects being developed by the U.S. Army Medical Materiel Development Activity, go to ***https://www.usammda.army.mil/****.*

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A NETWORK, STAT!

C5ISR COVID-19 Response Equipping Team keeps Army's units connected.

by Col. Shane Taylor, Col. Troy Denomy, Col. Lesley Kipling and Amy Walker

When the world was brought to a sudden halt at the onset of the COVID-19 pandemic last spring, a team of experts from the Army's network development and acquisition program offices shifted into high gear. Their unified efforts ensured that U.S. Soldiers supporting local and state governments were equipped with the latest situational awareness and communication systems needed to support their unfolding pandemic response missions.

Just as it would in tactical battlefield operations, the team understood that providing both dismounted Soldiers and headquarters elements with real-time situational awareness would enable collaboration and faster, more accurate decision-making in the fight against COVID-19. Getting first responders and essential personnel to the right place at the right time with the right information and supplies was the only way to take ground.

Through a cohesive team-of-teams approach, the Army's network modernization community—including the Program Executive Office for Command, Control, Communications – Tactical (PEO C3T), PEO Soldier, the Network Cross-Functional Team and Communications-Electronics Command (CECOM), with the Army's Chief Information Officer/G-6 and G-3/5/7—proactively stood up the Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) COVID-19 Response Equipping Team, in March 2020. The team worked closely with U.S. Northern Command and U.S. Army North (ARNORTH), the Army National Guard and the U.S. Army Corps of Engineers to rapidly provide COVID-19 response units with the latest network communications capability, integration expertise and robust help-desk services to augment and enhance their organic communications systems.

Aligned under U.S. Northern Command (NORTHCOM), ARNORTH serves as the joint forces land component command for all federal ground troops in the continental United States in support of homeland defense and defense support of civil authorities missions. ARNORTH is NORTHCOM's



NEW WAYS TO COMMUNICATE
CRSSTALK is a map-based, situational awareness software application that can be used across multiple platforms to provide tactical capabilities for military and federal government operations. (Photo by Amy Walker, PEO C3T)

designated lead component to work with the Federal Emergency Management Agency (FEMA) to align federal military support to validated requests for assistance. At the height of its response in April 2020, NORTHCOM had more than 9,000 service members deployed across the country and supported over 130 FEMA missions. Additionally, in the early phase of the COVID-19 response, as U.S. experts were still trying to understand the coronavirus and how the pandemic would evolve, the Army regionally aligned four task forces, whereby Army National Guard units and other elements supported a wide mix of mission sets including medical, communications and logistics. The Army National Guard had more than 40,000 Guardsmen on orders supporting state and federal missions during the peak of the COVID response. With so many moving parts and players, communication and situational awareness were absolutely critical.

The C5ISR COVID-19 Response Equipping Team's combined strengths ensured that both front-line and support elements possessed the data exchange and common operational picture they needed to successfully collaborate and support the pandemic response efforts. The team delivered capabilities and services that were already part of Army programs, repurposed capability in innovative ways to support unique COVID-19 mission sets, and rapidly procured new communication systems as needed. They also ensured help desk functions were established to troubleshoot tactical network communication issues as they arose in the field. Their rapid delivery of enhanced network applications and communications equipment led to a better understanding of regional COVID-19 impacts and assisted commanders working with FEMA and local governments in their response efforts.

A STRONG NETWORK COMMUNICATIONS PLAN

Military, government and non-government agencies, and first responders leveraged the robust U.S. commercial network infrastructure as their primary means of enabling voice, video and data exchange in COVID-19 response efforts. Working with ARNORTH and Army National Guard network managers and planners, the team helped identify the rest of the primary, alternate, contingency and emergency communications plan, and assessed unit and system readiness, to ensure redundant backups in case the primary commercial communication infrastructure got overloaded or damaged.

To securely exchange network data between commercial and military networks in support of ARNORTH and Army National Guard missions, the Army leveraged its existing network gateways. These included Commercial Coalition Equipment (CCE) network enclaves, regional hub nodes (RHNs) and the Global Agile Integrated Transport (GAIT) mesh network design that

interconnects global data transport. At the height of the response efforts, RHNs and GAIT supported over 100 GAIT missions in total, with 72 simultaneous ARNORTH and Army National Guard COVID-19 missions.

Additionally, in cases where needed, Army National Guard units used their Disaster Incident Response Emergency Communications Terminal (DIRECT) tool suite, which includes CCE, to connect to the U.S. commercial networks. CCE is a critical component in the DIRECT system, which also enables interconnection between cell, landline and Voice over Internet Protocol (VoIP) calls, between various military and first responder radios to enable a seamless collaboration and synchronization across the entire mission. The DIRECT equipment kit enables Army National Guard units to provide commercial phone, internet access, Wi-Fi and 4G LTE to military, government and nongovernmental first responders as needed.

The team worked across the Army's materiel community to provide systems as they were requested by units, such as military Secure Wireless equipment requested by ARNORTH Headquarters, at Fort Sam Houston, Texas. Secure Wireless provided rapid network connectivity for personnel as they moved through ARNORTH headquarters for deployments around the country. The team also provided the system to ARNORTH mobile response teams so they could scale up their networks to cover a large area wherever they were deployed. Adhering to travel restrictions and social distancing policies, the team provided remote Secure Wireless training via Microsoft Teams to the ARNORTH G-6 network technicians, as well as client software, training support packages, and an updated wiring diagram, via secure file exchange platforms.

CALL THE 24/7 HELP DESK

To assist National Guard and ARNORTH with tactical network initialization, integration, system troubleshooting and maintenance issues, the team stood up a help desk to provide 24/7 network assistance. The collaborative effort among PEO Soldier, PEO C3T and CECOM leveraged the existing Mission Command Support Center, at Aberdeen Proving Ground, Maryland, which primarily assists with network management and troubleshooting of the Army's Blue Force Tracker capability. The help desk served as a single point of entry for COVID-19 response units to request technical assistance from PEO C3T and CECOM experts on all Army tactical network devices and communications systems.

Rapid delivery of enhanced network applications and communications equipment led to a better understanding of regional COVID-19 impacts.



LOAD 'EM UP

The 63rd Expeditionary Signal Battalion, 35th Signal Brigade is moving personnel and equipment in support of U.S. Northern Command and ARNORTH's request for defense support of civil authorities in response to the COVID-19 pandemic by providing communications support to areas affected by COVID-19. (Photo by Staff Sgt. Joseph Truckley, 50th Public Affairs Detachment)



COMMS DEPLOY

A member of the Hunter Army Airfield Air movement team loads communications equipment onto a plane at Hunter Army Airfield, Georgia, as Soldiers prepared to deploy in support of the Federal Emergency Management Agency. (Photo by Staff Sgt. Joseph Truckley, 50th Public Affairs Detachment)

AN APP FOR THAT

A key effort led by PEO Soldier adapted and delivered—in less than three weeks—a civilian version of the Army's Tactical Assault Kit software, to provide National Guard and other agencies with up-to-date COVID-19 data on a common software application that can run off personal devices. Using a combination of fielding new smartphones capable of using the applications, and a "bring your own device" strategy, the Contingency Response Situational Awareness/Situational Understanding Tactical Applications Leader Kit effort (CRSSTALK), delivered a line of map-based, situational awareness software applications across multiple platforms, to provide tactical capabilities for military and federal government operations. This effort was coordinated with ARNORTH, the Army National Guard and individual states, and 20 states and territories received the CRSSTALK capability.

The team provided ARNORTH and Army National Guard personnel with applications and communications equipment that led to a better understanding of regional COVID-19 impacts and enabled a common operational picture for commanders and government and local agencies to collaborate more closely. Units used the Mission Command Support Center to enable interoperability across a wide range of military and civilian devices, and to virtually train supporting units on the latest applications. Most

The DIRECT equipment kit enables Army National Guard units to provide commercial phone, internet access, Wi-Fi and 4G LTE to first responders as needed.

important, the support center, in conjunction with Johns Hopkins University, constructed a dashboard to display relevant COVID-19 data on a common map, enhancing collaboration among first responders, local and national agencies and Army National Guard personnel.

IMPROVED READINESS TO SUPPORT AN UNKNOWN FUTURE

When the U.S. moves into various phases of recovery, elements of the C5ISR COVID-19 Response Equipping Team continue to communicate with ARNORTH and the Army National Guard to ensure they have the communications capability needed to support pandemic response efforts. As of October 2020, with the onset of colder weather and a potential for a spike in COVID-19 cases, the team remained ready to provide additional support and capability as needed to enable situational awareness, better logistics data and enhanced network connectivity.

The network enhancements and lessons learned from this rapid homeland response effort can be leveraged to support future homeland response missions, from COVID-19-related efforts to other natural or man-made disasters. As on any battlefield, communication remains the No. 1 priority in all future domestic operations.

For more information, go to ***http://peoc3t.army.mil/c3t/*** *or contact the PEO C3T Public Affairs Office at 443-395-6489 or* ***usarmy.APG.peo-c3t.mbx.pao-peoc3t@mail.mil.***

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COL. LESLEY KIPLING is a signal officer and serves as the Mission Command Portfolio lead and Army National Guard liaison officer for the Network Cross-Functional Team. She holds a master's degree in communication and public policy from American University and an M.S. in government information leadership from National Defense University.

AMY WALKER has been the public affairs lead at Project Manager Tactical Network for the last 10 years, and was the public affairs lead at PEO C3T for the previous two. She has covered a majority of the Army's major tactical network transport modernization efforts, including Army, joint and coalition fielding and training events worldwide. She holds a B.A. in psychology, with emphasis in marketing and English, from the College of New Jersey. A frequent contributor to Army AL&T, her last article appeared in the Summer 2020 edition.



ESSENTIAL FEEDBACK
Soldiers from the Maryland Army National Guard 58th Troop Command Headquarters and Headquarters Detachment use CRSSTALK to support COVID-19 response efforts at Adelphi, Maryland. The unit is providing feedback as part of a CRSSTALK pilot to enable the Army to continue to enhance capability. (Photo by Amy Walker, PEO C3T)

TRAINING AT A SOCIAL DISTANCE

It was business as usual—until it wasn't—for the Project Manager Tactical Radios' (PM TR) fielding, installation and training team. With one month remaining in its assignment with Soldiers from the 5th Security Force Assistance Brigade at Joint Base Lewis-McChord, Washington, the COVID-19 pandemic struck. Charged with completing the installation of multiple radio capabilities, including high-frequency radios, mounted leader radios and HMS Manpack Radios onto the brigade's vehicle fleet, the team adjusted efforts by employing personal protective equipment to continue its mission amid the unit's activities of recovering its personnel to begin isolation for COVID-19. The team maintained safe operations, on schedule, to ensure the brigade met its exercise and deployment plans.

As the pandemic persisted, the team adapted by quickly creating, testing and implementing a virtual new equipment training course for multiband radio operations as a substitute for in-person training. It launched the virtual new equipment training course with the brigade at Fort Hood, Texas, where it used collaboration software to broadcast from classrooms at Fort Hood to brigade Soldiers at Joint Base Lewis-McChord. The team continued to conduct virtual new equipment training from Fort Hood to Soldiers with the1st Brigade Combat Team, 82nd Airborne Division (1/82 ABN) at Fort Bragg, North Carolina. When travel restrictions relaxed, the team shifted to a combination training model with the 1/82 ABN while still adhering to social distancing protocol.

The lead instructor conducted live classroom training to a small number of Soldiers and then broadcasted the training to additional smaller classrooms onsite, with assistant instructors positioned in the classes to facilitate the training.

When COVID-19 continued to impact new equipment training and integration schedules, and with critical missions scheduled for several security force assistance brigades, in-person training was the only viable option. Just before the pandemic, the Security Force Assistance Command scheduled a comprehensive communications capability vehicle integration event at Fort Benning, Georgia, for three such brigades. With special consideration from the U.S. Forces Command, the event proceeded.

Donning personal protective equipment, maintaining distancing to the extent practicable and segregating equipment into individual tool kits to minimize sharing, the team upgraded power, mission command and tactical radio equipment for the 1st, 2nd and 54th Security Force Assistance Brigades' M1151 Humvees.

PM TR continues to adapt to the COVID-19 pandemic by employing virtual new equipment training and in-person installation training adjusted for safety to ensure Army units can quickly deploy with the modern communications equipment critical to their missions.

—MICHAEL MECURIO AND KATHRYN BAILEY



BRAND NEW

Soldiers with the 5th Security Force Assistance Brigade trained virtually on new equipment in April 2020 to ensure their readiness using multiband radios for current and future missions. (U.S. Army photo by 5th Security Force Assistance Brigade public affairs).



FEEDBACK IS KEY
A Soldier wears the IVAS and wields a Squad Immersive Virtual Trainer prototype at a touch-point event. If not for constant Soldier feedback from these events, the IVAS team would have had a more difficult time adapting the program to COVID-19 restrictions. (Photo by Courtney Bacon, PEO Soldier)



PANDEMIC-READY

How PEO Soldier has kept IVAS on track as COVID-19 crisis alters plans and procedures.

by Courtney E. Bacon

The COVID-19 pandemic has presented the military and its industrial partners with unique challenges that have forced top modernization efforts to shift standard operating procedures and project timelines.

However, the Army's Project Manager (PM) for the Integrated Visual Augmentation System (IVAS), in the Program Executive Office (PEO) for Soldier, has worked to minimize COVID-19's negative impact to the project and the warfighter. To do this, the IVAS team leveraged distributed-work solutions already in routine use, modular hardware design, a core Soldier-centered design philosophy and an intentional supply chain risk-management strategy to support force readiness despite the additional challenges presented by the pandemic.

IVAS is a low-profile, ruggedized heads-up display integrated into the Soldier's helmet. The goggle hardware is supported by a wearable computer pack, conformal battery, integrated sensors and a squad radio. Collectively, the system provides the close combat force a single platform to fight, rehearse and train. The concerted hardware and a host of services together enable the platform to serve as a combat multiplier.

NOT JUST GOGGLES

When most think of IVAS, the goggle and Soldier-borne hardware package are what comes to mind. However, the complete IVAS suite of capabilities multiplies its warfighting potential beyond just the wearable system. For example, the Squad Immersive Virtual Trainer uses tactical mixed reality in a portable synthetic training environment to enable unlimited iterative training in any domain.

IVAS also uses a cloud architecture to host an information-sharing platform. This enables the IVAS project to provide advanced tactical services that streamline secure data exchange between Soldiers and command; information on adaptive squad architecture to allow for maximum integration and interoperability of system-level kit; and human-performance monitoring tools that enable tactical leaders to make informed, data-driven decisions that optimize the performance of their Soldiers and the lethality of their squads.

The combination of these capabilities is expected to increase the situational awareness and lethality of Soldiers on the battlefield by:

- Enabling the secure exchange of relevant information to and from command and control.
- Combining equipment to reduce weight while maintaining maximum function.
- Monitoring human performance to ensure squad effectiveness.

A PRESSING NEED

Army leadership saw a gap in its close-combat force and mobilized a team to find a comprehensive solution that would provide an unquestionable tactical advantage in the future battlespace.

"Senior defense officials recognized the erosion in close-combat capabilities and saw an immediate need to ensure overmatch for our dismounted force," said Mark Stephens, PM IVAS director of acquisition and operations. "Congress recognized the requirement and reprogrammed funds to start IVAS in FY19. Within six months from the secretary



COMPONENTS OF A WHOLE
Hardware components of the third capability set prototype of IVAS include the heads-up display, conformal wearable battery and puck, as well as the Family of Weapon Sight – Individual. (Photo by Courtney Bacon, PEO Soldier)



HEADS UP
The Capability Set 3 militarized IVAS prototype. (Photo by Courtney Bacon, PEO Soldier)

of defense's approval in late May, 'Team IVAS' awarded multiple other-transaction agreements to industry and kicked off IVAS before Christmas 2018."

From the program's inception, the IVAS rapid-prototype effort required fast-paced and well-organized work from partners around the country. Therefore, the distributed team had built and relied on a digital infrastructure to manage the mission from any physical location. This postured them for success, as they were able to mitigate impacts to the mission and maintain operations, even with social-distancing protocols, while many other projects were more heavily impacted. Before the pandemic, the iterative testing took place in the form of in-person user studies and juries. However, the developmental sprints soon transitioned to taking place remotely, and the team employed the expertise of IVAS test and technology personnel as well as their experienced equipment trainers to push collective feedback to industry partners at Microsoft.

The new strategy allowed the team to continue exchanging sprint software updates between military and industry partners, test the updates in a safe, distributed environment and provide feedback to manage performance risks without having to wait until large test events to discover issues.

TEST PRIORITIES

"As COVID-19 impacted the organization, the test directorate determined that we could still conduct thorough Army-enabled testing with focus on developing the rapid target acquisition, tactical-assault kit, synthetic training environment and other necessary capabilities while maintaining requisite social distance and implementing COVID-approved decontamination procedures," said Jared Walega, PM IVAS test director.

"Our dispersed team is extremely capable and is able to download the latest software build and load it onto their heads-up displays to continue to iterate. This process has enabled remote testing of software builds and the ability to provide rapid feedback to Microsoft, [including] live-fire video, data and assessments," Walega added.

Targeting specific capabilities of IVAS for remote development was possible because of the modular architecture and scalable build approach of the composite IVAS system.

"As the hardware matures, we are able to update different aspects of the current form factor based on the modular 'plug and play' infrastructure. What that really means is that, as sensor or camera capabilities improve, we are able to pull the obsolete legacy version and replace it with new tech without having to recreate

or re-engineer the rest of the integrated hardware," explained Master Sgt. Marc Krugh, senior enlisted adviser to the PM IVAS test team.

The intentionally scalable architecture, remote collaboration technology and partnership with Microsoft have supported the sustained testing through the pandemic. While the IVAS team's partnership with Microsoft looks different during the pandemic, as both organizations prioritize the safety of their equipment and personnel, they continue to work together to deliver for the warfighter.

"Microsoft brings cutting-edge, industry-leading techniques that have enabled us to create, test and implement equipment to increase the lethality and mobility of the Soldier and Marine on the battlefield. We continue to value our partnership and take advantage of our remote collaboration solutions that allow us to push forward on planning, verifying and validating toward our end solution, even with COVID restrictions," said Krugh.

SOLDIER-CENTERED DESIGN

The continued testing and iterative improvement of specific IVAS capabilities throughout the pandemic has been enabled largely by the Soldier feedback collected at every stage of the project's development.

"Soldier-centered design was developed in IVAS as a combination of Microsoft's human-centered design philosophy and tailored Army acquisition best practices," said Walega. "It focuses on current Soldier and Marine input throughout the entire development process to prevent engineers and developers from building a product that does not meet the priorities of our warfighters."

To ensure that IVAS will truly maximize Soldier lethality, the intentional collection of Soldier feedback at every design and decision point has been a program priority.

IVAS has hosted three Soldier touch-point events, in March 2019, November 2019 and completed the third and largest during October 2020. The IVAS team plans to host one final test event in the third quarter of the 2021 fiscal year. These events put the most up-to-date hardware and software capability sets in the hands of Soldiers to test performance in relevant tactical environments at each decision point.

BRING DATA

"By the end of this [third Soldier touch-point] event, 'Team IVAS,' which includes the CFT [cross-functional team], PEO



SCALABLE DATA

IVAS Supply Chain dashboard "local" view that is geographically set at latitude, longitude and zip code. Red bubbles represent COVID-19 data. The blue and green points are color-coded based on IVAS component type. The report may be scaled for greater precision of the information conveyed, such as detailed vendor data. (Image courtesy of PEO Soldier)



HOT SPOT OVERVIEW

IVAS Supply Chain dashboard scaled for country and state view. Vendor supply chain information was overlaid with health data on COVID-19 hot spots to form a dashboard heat map so that leaders could make critical decisions with the most up-to-date data. (Image courtesy of PEO Soldier)

As the IVAS team continues to overcome the obstacles posed by COVID-19, leadership is unwavering in its dedication to the safety of Soldiers and the team.



STRIKE A POSE
A Soldier dons the Capability Set 3 militarized prototype of the IVAS during a Soldier touch-point live fire test event at Fort Pickett, Virginia, in October. (Photos by Courtney Bacon, PEO Soldier)

Soldier, Microsoft, Combat Capabilities Development Command, and a number of labs and directorates within the modernization enterprise, will have collected more than 40,000 hours of Soldier data," said Brig. Gen. Tony Potts, the program executive officer for Soldier.

Potts added, "If we want to develop systems at the speed of relevance, and systems that our Soldiers want to use, this is the way we have to do it. We have learned so much through Soldier-centered design. Our real desire is to let Soldiers design it, and then our engineers build what they design. It's about listening to our Soldiers."

The process puts emphasis on making a product that Soldiers will feel confident using to increase their lethality and maximize their efficiency, both in training and on the battlefield.

According to Walega, "If a Soldier loves and uses IVAS, then we have provided a system that has much greater capability than the current kit."

The Soldier-centric approach has turned out to be a key asset to the project during the disruption in normal operations. Though large-scale test events such as the third Soldier touch-point event included added COVID-19 mitigation precautions, the internal program schedule was also reorganized so as not to delay the deployment of IVAS to the warfighter.

COVID PRECAUTIONS

Although the Soldier touch-point event looked different, Maj. Sean McIntosh was the PM IVAS teammate tasked with leading the implementation of safety measures so that the team was able to continue the mission safely.

"Setting conditions that allow us to continue work during this time is critical for our program's success," said McIntosh. "COVID mitigation has been mandatory for everything we do in and out of the office. The entire workforce remains proactive to keep each other safe and has been diligent in abiding by and enforcing the necessary standards to ensure we remain on schedule."

The team also preemptively reordered the intensive hardware and software design reviews that were initially going to take place after the third Soldier touch-point event, and used their remote tools and a plethora of Soldier feedback to expedite the hardware design review so that it could take place before the October event. This allowed the formal software design sprint to be completed after the third touch-point, and for both designs to be finalized during Capability Set 4 iterations.

"We wouldn't have the flexibility that we do, frankly, if we hadn't been doing Soldier touch-points, user juries, user studies and human factors engineering excursions throughout the entirety of the program," said Col. Christopher Schneider, IVAS project manager.

SUPPLY-CHAIN RISK MANAGEMENT

Soldier feedback is a contributing factor that has enabled the IVAS project to move forward despite challenges imposed by the coronavirus pandemic. The team's innovative supply chain risk management



strategy and foresight have also significantly contributed to mitigating challenges that have stalled many others.

"With the advent of the coronavirus, the supply chain risk-management strategy has taken on a new level of importance," said Nicholas Pate, PM IVAS manufacturing engineer. (See related article, "The Visible Supply Chain," Army AL&T, Fall 2020, Page 45.)

"IVAS vendors have worked tirelessly to assess, analyze and make quick decisions to avert imminent delays. Luckily, the PM IVAS supply chain strategy, from the very start of the program, has always been to mitigate risk by avoiding sole sources of supply, cultivating multiple sensor vendors and ensuring parallel paths of supply," said Pate.

Though the pandemic has impacted supply chains across industries, the IVAS team has refined its original supply-chain management strategies using flexible vendors that have reacted quickly to minimize negative impacts from COVID-19.

"Microsoft, as well as the low-light and thermal-sensor vendors, delivered preliminary supply chain information on critical components for early risk-mitigation assessment on the IVAS supply chain," Pate said. "This information ensures that quality and security controls are implemented to ensure a stable and sustainable supply chain."

The supply chain information collected from vendors was overlaid with health data on COVID-positive "hot spots" to form a dashboard heat map display so that leadership could make critical acquisition and fielding decisions with the most up-to-date data.

"A comprehensive supply chain visibility solution gives program managers the ability to better forecast production and delivery schedules, prioritize risk, and implement alternate sources of supply or contingency plans to ensure equipment can be fielded as planned," said Stephens. "For fielded systems, [supply chain visibility] will provide unit commanders the ability to better estimate the material availability and readiness for mission tasking and training exercises."

"It certainly has for us," Stephens added.

CONCLUSION

As the IVAS team continues to overcome the obstacles posed by COVID-19, leadership is unwavering in its dedication to the safety of Soldiers and the team.

The third Soldier touch-point event successfully took place at Fort Pickett, Virginia, in October, with proper and thorough COVID-19 mitigation strategies at every step.

The project continues its modernization efforts in service to the Soldier thanks to the team's remote collaboration technology, scalable architecture, core Soldier-centered design philosophy, supply chain risk-management approach and valuable partnerships within industry.

"I can absolutely say that today we are on track to meet a fourth quarter '21 delivery for our first unit equipped," said Schneider

For more information, contact PM IVAS Public Affairs Officer Courtney Bacon at ***courtney.e.bacon.ctr@mail.mil,*** *or visit the PEO Soldier website at* ***https://www.peosoldier.army.mil/.***

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HEAVENLY HOST
The cloud reduces hosting costs, improves continuity of operations and increases security. (Photo by GettyImages)



A MAP TO MIGRATION

U.S. Army Acquisition Support Center charts a course to cloud migration amid shifting regulations, provides lessons learned.

by Ellen Summey

Imagine trying follow a map that's still being drawn. To a location you've never been. With few clear landmarks along the way. It might involve some guesswork, you'd probably have to retrace your steps a few times and you'd need a reliable team. That's exactly what the U.S. Army Acquisition Support Center (USAASC) discovered—and laid out in a detailed white paper, with lessons learned—when moving its Career Acquisition Management Portal (CAMP) and Career Acquisition Personnel & Position Management Information System (CAPPMIS) to the Amazon Web Services commercial GovCloud.

It all started in June 2014, when the undersecretary of the Army signed a memorandum directing that all systems and applications providing enterprise services migrate to core data centers—designated to provide hosting and storage within the Army security architecture—no later than the end of fiscal year 2018. "At that point, cloud was being thought of, but it wasn't the first choice," recalled USAASC IT Enterprise Operations Manager Marc Poole, who was the organization's cloud migration lead. "Then, shortly afterward, there was further guidance with a little bit of a nudge from the DOD chief information

officer [CIO], to consider a 'cloud first' mentality, as DOD and Army wanted to get out of owning data centers and having to manage them."

Migration to a cloud environment enables organizations to consolidate infrastructure, rapidly scale as needed, and reduce duplicated services while reducing hosting and maintenance costs, improving continuity of operations, and increasing security through centralized control and access authorization. Why buy and manage a mountain of servers when you can essentially rent them on demand and forego the maintenance expenses? That's the infrastructure-as-a-service model, in a nutshell. "The whole premise behind cloud is that you get what you pay for, and you only pay for what you use," Poole said. "But we didn't have yet any metrics to show what we were actually going to consume." And that was just one of the hurdles along the way.

FOGGY GUIDANCE

The organization had its goal—move its systems and its more than 40,000 users to the cloud. But the directions were less than clear. They began following the as-then-defined Army process, which was still being developed. "Our CAMP and CAPPMIS system was in the sustainment phase, so we had to provide the maintenance and sustainment, and also carry out the directive of moving to the cloud. We wanted to use the Army-defined process and help to create that map to share our experiences with others," Poole said. "We were all working together to figure things out, and leaning on each other to define them."

Poole said that he and the USAASC team encountered two particularly difficult challenges during the migration effort. First, the Army and DOD's testing and standards had not yet caught up to the technology in question. Security guidelines for an Army-owned data center are simply not compatible with commercial cloud computing processes. Second, many of the personnel responsible for inspecting and certifying Army information systems had never worked with cloud systems before. "We found that we were sort of talking past each other at times," Poole said. "Because there was no real defined process of what was

USAASC worked with stakeholders across DOD and the Army to create a sustainable transition to the cloud environment.

A MIGRATION TIMELINE

USAASC's migration to a commercial cloud environment spanned several years, in total. The following are key milestones:

June 2014—Secretary of the Army directed the migration of Army enterprise systems and applications to core data centers.

July 2015—The Army CIO/G-6 provided guidance for the migration of enterprise applications to the commercial cloud.

October 2015—USAASC completed the migration survey provided by Army Application Migration Business Office (AAMBO).

November 2015—AAMBO delivered version 1.0 of its migration assessment and rough order of magnitude (ROM) of the CAMP environment and recommended that it move to the Defense Information Systems Agency hosting services.

February 2016—USAASC requested assistance from Acquisition Management Support Solutions (AMS2) to leverage their migration efforts for an analysis of alternatives and proof of concept to validate AAMBO's recommendation.

April 2016—Analysis of alternatives started.

February 2017—Microsoft Azure proof of concept developed.

April 2018—Cost-benefit analysis approved by HQDA CIO/G-6. USAASC allocated funding to complete its migration.

June 2018—Upon receipt of funding for the migration, USAASC engaged with AMS2 to initiate the effort.

July 2018—Amazon Web Services (AWS) environment established.

January 2019—Initiated AWS hosting service contract

February 2020—Enterprise Mission Assurance Support Service package workflow initiated.

March 2020—Authority to operate received.

April 2020—Go live.



CLOUD NAV
Lessons learned during USAASC's cloud migration of CAMP and CAPPMISS will help guide future efforts. (Photo by 1st Lt. Steph Sweeney)



INFORMATION LANDSLIDE
When USAASC first received the directive for cloud migration, the guidance was spotty. Along the way, the team encountered a few unforeseen challenges. (Photo by Samantha Tyler)



THE PATH TO SUCCESS
There is a strict process for cloud migration, and each task must be completed, one after the other, much like an obstacle course. (Photo by 1st Lt. Stephanie Snyder, 25th Infantry Division)

to be looked at and how, and there was a learning curve for people who didn't fully understand the cloud environment."

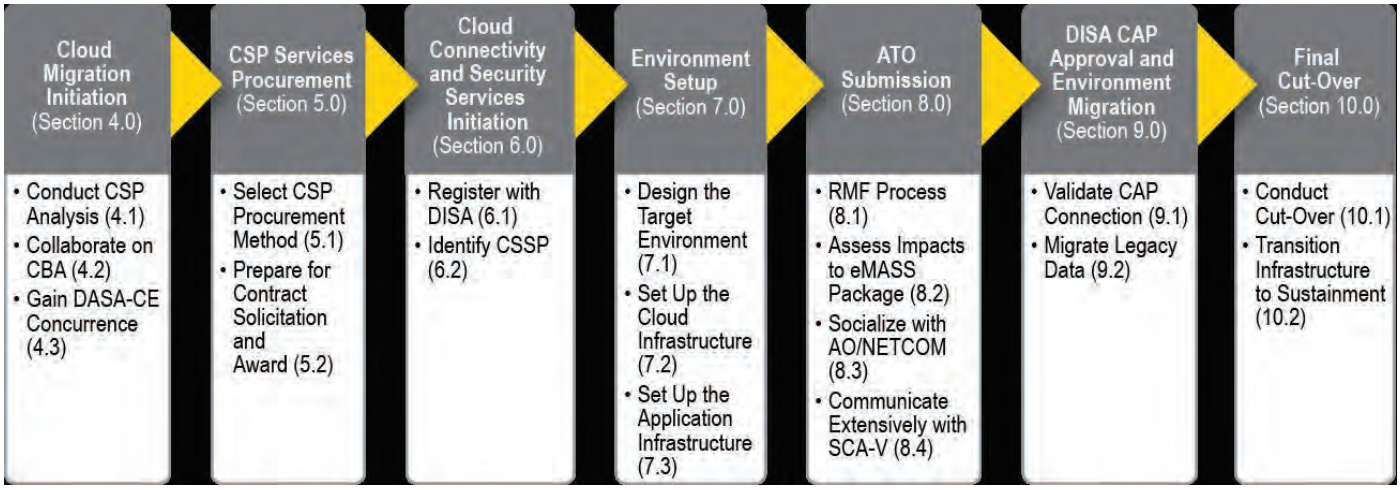
CREATING THE MAP LEGEND

But the team forged ahead through the uncertainties, working to clarify and test the Army's processes for other organizations to follow. Ultimately, USAASC worked with stakeholders across DOD and the Army to create a sustainable transition to the cloud environment. The organization successfully moved its CAMP and CAPPMIS systems from a traditional data center to the commercial Amazon Web Services GovCloud environment in April 2020. There are several critical takeaways learned during migration for a Cloud Computing Security Requirements Guide Impact Level 4 system, which is a computing environment certified to handle personally identifiable and sensitive information.

Conducting the required cost-benefit analysis demands a thorough understanding of the system to accurately estimate compute resource needs (e.g. number of instances, storage requirements, network throughput, etc.). When possible, a proof of concept should be performed in the targeted cloud service provider environment to help the team validate assumptions and accurately evaluate alternative commercial providers.

The government should procure cloud infrastructure resources separately and not as part of its system integrator's other-direct-costs line. This prevents a scenario where the root account credentials and overall security posture fall solely under the contractor's purview and may introduce significant risk to government.

The new cloud environment will require services from an approved cybersecurity service provider for endpoint security and vulnerability scanning tools. The majority



KEY

AO: authorizing official
ATO: authorization to operate
CAP: cloud-access point
CBA: cost-benefit analysis
CSP: cloud-services provider
CSSP: cybersecurity-services provider
DASA-CE: deputy assistant secretary of the Army for cost and economics
NETCOM: Army Network Enterprise Technology Command
RMF: risk-management framework
SCA-V: security control assessment – validation

MIGRATION PROCESS

The commercial cloud migration process offers an outline for cloud migration phases, from cloud migration initiation to the final cutover, and identifies the key phases (e.g., cloud migration) and major steps (bulleted list) based on USAASC's migration project. The section identified in parentheses outlines the key lessons learned that align with each phase. (Graphic by USAASC)

of the tools configuration and customization will be the responsibility of the system owner and the designated system administrator.

The IT system design should be established well in advance and based on unique system requirements, not default commercial settings. The latter approach may introduce unnecessary dependencies on the infrastructure and result in extensive rework in the future if the system needs to be migrated to another service provider.

The IT portfolio system will require a new authorization to operate prior to the "go-live" in the new cloud environment. Because of limited familiarity with cloud technologies across government organizations at present, it is strongly recommended to coordinate closely with all parties by performing additional checkpoints and gaining consensus upfront on the strategy for the Enterprise Mission Assurance Support Service package.

Conducting pre-migration tests of the available data migration options will help determine the best one to utilize and support migration of the IT portfolio's high-priority applications and environments first.

Throughout the final transition activities, frequent synchronization meetings with government stakeholders are recommended, to provide progress updates, address any issues or risks and receive feedback from users. A formal gate review should be conducted to formally transition the infrastructure to sustainment. These activities should identify any open findings, risks, issues or actions needed for a successful transition.

"We were all working together to figure things out, and leaning on each other to define them."

"My biggest takeaway from this entire process would be that you should get in touch with ECMO [Enterprise Cloud Management Office], up front and early," Poole said. "It's very important that is the first step you take." He advises organizations to ask for the most up-to-date guidance before moving forward, but said they should be ready for that process to change along the way. "If you think you're going to make it to the cloud in a year, double that," he said. "Not that it's going to take you that long to get through the process, but as the process changes, be prepared to change your direction a couple of times."

CONCLUSION

The map to migration is becoming more clear, thanks to the efforts of USAASC and key players within the Army and DOD. Poole and the IT Enterprise Operations team at USAASC have provided the entire experience in a white paper, through which they aim to share these and other insights with Army stakeholders and other organizations planning to move to the cloud.

"It's all about helping each other out, sharing those lessons learned, and working together to accomplish this goal," he said. With their insights as a guide, perhaps other commands can accomplish their own migrations while sidestepping a few potholes.

For more information on the Army's 2020 Cloud Plan, go to ***https://go.usa.gov/x7ptF*** *or download the USAASC cloud migration white paper at* ***https://asc.army.mil/web/wp-content/uploads/2020/12/USAASC-Cloud-White-Paper.pdf***

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ROLES AND RESPONSIBILTIES

The Army Application Migration Business Office (AAMBO) was responsible for the initial cloud readiness assessment, cost-benefit analysis assistance and served as a liaison between the application owner and the DOD-approved enterprise environment providers. This office later became part of the Enterprise Cloud Management Office, which serves as the enterprise cloud migration resource for Army data and application owners.

Chief Information Officer/G-6 (CIO/G-6) is responsible for application migration and data center consolidation policy and provided concurrence on cost-benefit analysis submissions.

Deputy Assistant Secretary of the Army for Cost and Economics reviews and may provide final concurrence for the cost-benefit analysis.

Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology's Office of the Chief Systems Engineer is responsible for the overarching cybersecurity for USAASC and contributes to the risk-management framework and authorization process through the authorizing official and the Program-Information System Security Manager roles.

System or application owner is responsible for application rationalization, cost-benefit analysis, cloud-services provider procurement, cybersecurity-services provider agreements, environment setup and migration, obtaining authorization to operate, final cut-over and sustainment on cloud.

Defense Information Systems Agency (DISA) registers the migrated system and provides access to a cloud-access point. A cloud-access point is needed for all Impact Level 4 or 5 cloud environments to connect to the DOD network.

The U.S. Army Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Center is the cybersecurity-services provider. It provides host-based security system and Assured Compliance Assessment Solution licenses to track vulnerabilities within the USAASC IT system environment.

(***Source: USAASC cloud migration white paper***)



NICHOLAS T. KALINOWSKI

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

TITLE: Test Officer

YEARS OF SERVICE IN WORKFORCE: 11

AAW/DAWIA CERTIFICATIONS: Level II in test and evaluation, member of the Army Acquisition Corps

EDUCATION: M.S. in systems engineering management from Naval Postgraduate School, B.S. in electrical engineering from Wilkes University

THE NUTS AND BOLTS OF ACQUISITION

Nick Kalinowski is not a suit-and-tie kind of guy. He enjoys getting to roll up his sleeves, tinker with machinery and analyze data in his role as test officer at Army Test and Evaluation Command (ATEC), U.S. Army Aberdeen Test Center (ATC), located at Aberdeen Proving Ground, Maryland. "I'm getting paid to have fun in this job," he said. "I work in the developmental testing side of test and evaluation [T&E], which is focused on a system's overall operation and its ability to meet the technical requirements in a controlled environment." In other words, what would happen to a certain piece of electrical equipment at 50 degrees below zero? What if it were transported over very rough terrain, or encountered electromagnetic interference? Soldiers depend on reliable power systems and electronics, and often use them in harsh conditions. Kalinowski is the person who makes sure they will be able to function when needed. And he's having a great time. "I could never go back to sitting at a desk for 40 hours a week," he said.

This summer, he completed his Master of Science degree in systems engineering management at the Naval Postgraduate School (NPS) in Monterey, California, and was awarded the Meyer Award for Outstanding Student in Systems Engineering (distance learning). He said it was a challenging program, though he initially misjudged the amount of work involved. "The last two years have ended all my hobbies," he joked. "I underestimated the amount of time that school would take, combined with our workload at the test center. My wife and I also bought a house, and we're still working on repairs and renovations. Unfortunately, that doesn't leave a lot of free time to watch sports."

As most homeowners will attest, the stream of home renovation projects can last for years. "I've had to retile the shower, hang lights, install ceiling fans, and I also just tore down the old deck and replaced it," he said. His current project is in the basement, where he's creating a sports-themed getaway. "I've got a big TV with built-ins, I have speakers in my walls, and it's all painted in Mets colors." Yes, the Mets. His mother's family grew up around Long Island, New York, so he was wearing orange and blue as a child in Pennsylvania. "My wife said it's time to finish up the basement, so I hope to have that project wrapped up in the next couple of weeks." Maybe then he'll have time for hobbies again.

Kalinowski doesn't mind hard work, but some things are more difficult than others. In his job at ATC, he said the most challenging thing is not the actual testing—it's the stakeholder engagement and managing expectations. "The focus of my job is to work with the customer to understand the requirements and objectives of their system, and to help the customer understand what kind of testing is needed to verify that those requirements are met."

The ability to understand the test requirements and balancing those expectations with test timelines can be a challenging part of the job. "People sometimes ask why the process can't be shorter, but it's important to balance speed with the appropriate protocols. It's like building a house—it would be great to move in next week, but you definitely want your home to be well built." That's the nature of testing, and something he tries to impart to younger team members. "I always tell them to take their time and do things the right way," he said. "If you don't fully understand the system, you could potentially create a problem—electrical hazards, fuel spills, etc. The first rule is to analyze and understand the whole situation. Do things the right way and take your time."

"I work in the developmental testing side of test and evaluation, which is focused on a system's overall operation and its ability to meet the technical requirements in a controlled environment."

Even with careful planning, sometimes things go wrong. Kalinowski has learned to stay calm and focus on clear communication in those instances. "It's hard to make that phone call and give someone bad news about their test," he said. "It's difficult, but you always have to stay calm, explain what happened, and make sure you're being clear. For some customers, a phone call is enough, but others might want to actually come in and see. It's about developing those relationships and knowing that every case is different." Every case is different, every test is different and Kalinowski said every day is different in his line of work.

"The best way to describe my job is that I have to be a jack of all trades for every situation, constantly herding cats while juggling 10 balls at the same time," he laughed. Though he sometimes feels like a circus master for the Ringling Brothers, he loves his job and has no interest in leaving. "I've been on the other side," he said. "I worked in industry before I came to the Army, and I know how good I've got it here—other jobs just don't have an attraction for me." He enjoys the work and is proud of supporting DOD. "The combination of working on data; seeing details down to the hundredth and thousandth of a second through computer analysis, while still having a level of hands-on work in the field, is immensely enjoyable," he said. "The sense of pride I have, knowing that I can ensure that a system becomes a vital piece of the DOD fleet, and something that the warfighter can count on for years to come—there's no piece of instrumentation to measure that."

—ELLEN SUMMEY



DIGGING IN
Kalinowski likes to roll up his sleeves and tinker with machinery. (Photo by ATEC)

ARMY EDUCATIONAL OUTREACH PROGRAM



STEM EDUCATION

Illustration by Getty Images

REACHING OUT

AEOP builds the STEM citizenry of tomorrow, one student at a time.

by Jack Meyer

After Noel Obi, 17, graduates from his Houston high school, he plans to go to college to major in mechanical engineering. With an assist from the Army Educational Outreach Program (AEOP), he's already on the path to that field of study.

By investing in educational programs that target students from kindergarten to postdoctoral, the Army is helping develop the science, technology, engineering and mathematics (STEM) leaders of the future. At its onset in 2010, the Army program built a consortium of like-minded organizations that are dedicated to creating STEM opportunities for all with the goal of empowering a pool of diverse STEM talent. Through these partnerships, the Army supports STEM enrichment programs and competitions, apprenticeships and scholarships. Using a strong network of Army scientists, committed teachers, school administrators, volunteers and alumni, the program-supported activities are promoted in classrooms and at conferences across the country, reaching students in every state and U.S. territory.

GROWING PARTNERSHIPS

Obi's passion for STEM was solidified through his participation in eCYBERMISSION—a national online science, technology, engineering and mathematics competition. Alongside his teammates, he successfully designed a compact bracelet that monitored health information—heart rate, breathing rate—of the wearer. Designed to protect older adults and young children, the bracelet sends an emergency alert to a designated contact if the vitals of the wearer reach emergency levels. The project advanced the team to the competition's regional and national levels.

The Army Educational Outreach Program is a journey of growth and opportunity for students who are traditionally underrepresented in the STEM fields, and it is the Army's single centralized STEM education program. The Office of the Deputy Assistant Secretary of the Army for Research and Technology (DASA(R&T)), the Army's senior proponent for STEM education, works in concert with the U.S. Army Combat Capabilities Development Command (DEVCOM) to provide these unique STEM experiences to students through AEOP. The need for STEM professionals has never been greater, with the number of STEM jobs growing 79 percent, according to the Pew Research Center—and still growing—in the U.S. in the last 30 years. It is AEOP's mission to help develop the workforce that will meet this need.

The programs these students and educators participate in are hosted in partnership with organizations like the National Science Teaching Association, the National Inventors Hall of Fame, universities and U.S. Army laboratories and centers. The goal of the AEOP is to provide both students and teachers a collaborative, cohesive portfolio of Army-sponsored STEM programs that effectively engage, inspire and attract the next generation of STEM talent in kindergarten through college programs and expose them to DOD STEM careers.

Another student, Jada Crockett, 17, from Fort Washington, Maryland, discovered her passion for medicine while learning about the laboratory researchers who focus on finding cures for untreatable diseases. During her Gains in the Education of Mathematics and Science (GEMS)—a summer STEM enrichment program for middle and high school students through participating Army research laboratories and centers—Crockett was exposed to a variety of careers she never knew existed, bolstering her interest in STEM.

EDUCATION IN ADVERSITY

This year, the program, along with the rest of the world, faced an unexpected circumstance: COVID-19. In a matter of weeks, the program and its partners had to develop new ways to administer their plans safely and effectively. In the face of so much uncertainty, AEOP maintained its commitment to providing high-quality STEM education to all participants. Through hard work and dedication to their students, nearly all of AEOP was able to offer programming in some capacity. In the cases of Junior Science and Humanities Symposium and eCYBERMISSION, the in-person national competitions were brought to life with video conferences, and students presented their research and projects to a panel of judges virtually. These presentations were live-streamed, so that people from around the world had the opportunity to tune in.

AEOP's programs cultivate interest in STEM and offer a pathway for STEM civilian talent through enrichment, competition, apprenticeships and experiential education, building an awareness of Army science and technology. Students of all proficiency levels, interests and social and economic backgrounds are encouraged to participate in real-world STEM experiences while also engaging with Army-sponsored mentors. By practicing alongside a researcher or having the opportunity to interact with STEM professionals, students are able to witness firsthand how the STEM concepts they learn in school become real research and careers.

Much of the strength of AEOP programming can be attributed to the team of teachers and volunteers who support it. Christine Girtain loves to introduce her students at Toms River High School in New Jersey to engaging experiences. That's why she volunteers with the Junior Science and Humanities Symposium (JSHS), where students compete for scholarships and awards, presenting their original research to a panel of judges and an audience of peers. At JSHS regional symposia,

Though AEOP looked different this year, the commitment to building and diversifying STEM education and careers remained a unifying theme.

ECYBERMISSION

ECYBERMISSION is a free, web-based STEM competition for students in grades six through nine that promotes self-discovery and enables all students to recognize the real-life applications of STEM. Teams of three or four students are instructed to ask questions (for science) or define problems (for engineering), and then construct explanations (for science) or design solutions (for engineering) based on identified problems in their community. Students compete for state, regional and national awards. The competition is run in partnership with the National Science Teaching Association (NSTA).

GEMS

Gains in the Education of Mathematics and Science (GEMS) is a summer STEM enrichment program for middle and high school students that takes place at participating Army research laboratories and centers. The program's mission is to inspire young people to pursue STEM careers. It's important, especially for those who may not have given serious thought to becoming scientists or engineers, that we reach them early enough so they can attain the right academic foundations to successfully continue their STEM studies in college. The Army-sponsored competition is run in partnership with NSTA.

JUNIOR SCIENCE AND HUMANITIES SYMPOSIA

The Junior Science and Humanities Symposia (JSHS) is a STEM program sponsored by the U.S. Army, Navy and Air Force that promotes original research and experimentation in STEM at the

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MENTORING THE FUTURE
A summer enrichment program, GEMS puts middle and high school students at participating Army laboratories, where they can work alongside a Near Peer Mentor on a project. (Photos courtesy of the author)

she networks with scientists and other educators to build her knowledge and connect her students to new mentors.

Dr. Bernhard Vogler is an associate professor in chemistry at the University of Alabama in Huntsville and a mentor with the Research and Engineering Apprenticeship Program (REAP), a summer program where college students learn and work alongside Army and university scientists. Before he was a professor and mentor, Vogler began his career as a synthetic chemist, then switched to natural products chemistry and now works in biochemistry and analytical chemistry. Through REAP, he shares his experiences with mentees to model the myriad potential career pathways for this next generation.

Holly Miller teaches integrated STEM to sixth-graders in Indiana while also pursuing a Ph.D. in STEM education at Texas Tech University. Teaching STEM out of a textbook is no longer an option, she says—students need authentic, engaging experiences. Participating in Research Experiences for STEM Educators and Teachers (RESET), which is administered in collaboration with Tennessee Tech University, inspired her and provided new resources for her classroom. Hosted by participating Army laboratories and centers, RESET reinforces teachers' content knowledge through research experiences and interactions with Army and DOD scientists and engineers.

A lot of AEOP programming is geared toward middle school students to increase interest in STEM from a young age, so students enter high school considering a future in STEM. Ymaris Casas is a middle schooler who loves science and has spent several summers building her knowledge through Camp Invention, a weeklong summer camp designed by the National Inventors Hall of Fame that introduces some of the nation's youngest learners to the world of STEM. Camp Invention's high-quality curriculum and experiences offer invaluable insights from real inventors inspiring a passion for innovation.



THE EXCITEMENT OF INVENTION
Camp Invention students test out one of their STEM inventions during the weeklong summer program, where children seek answers to real-world problems.

"The Speedsters," also known to their families as Austin Ledyard and Carter Eibel, competed with Junior Solar Sprint, a solar car building competition hosted by the Technology Student Association. For these middle schoolers, their love of STEM was sparked once they realized they had a shot at winning. By building a better, faster and cheaper solar racer than any other team, they raced their way to the finish line.

The Technology Student Association also facilitates a summer program for high school students at higher education institutions. The Army Educational Outreach Program not only sparks student interest in STEM at a young age, but keeps students engaged in STEM by creating a pathway of programming for students to follow. That's where Janay Gilmore experienced hands-on STEM enrichment and career exploration. She reaffirmed that she was on the right track to follow in the footsteps of her hero, Dorothy Vaughan, one of the mathematicians featured in the book and major motion picture "Hidden Figures," and aims to someday work at NASA. The program focuses on encouraging students like Gilmore to pursue college majors and careers in engineering and other STEM-related fields.

VIRTUALLY EVERYWHERE

To adapt to the new reality, several GEMS and Unite locations took their STEM adventures online this summer, offering students the chance to follow along via virtual instruction. Camp Invention launched Camp Invention Connect, a virtual version of their in-person program. Registered students had activity kits sent to their homes that were full of the materials they needed for the week's projects. Participants had the option of a screen-free, self-led experience or to connect with certified education coaches and fellow campers to interact and collaborate online.

Since labs were not able to host student researchers, AEOP apprenticeships had to get creative. The Rochester Institute

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high school level. Students have the opportunity to compete at the regional and national level. JSHS is run in partnership with NSTA.

AEOP APPRENTICESHIPS

AEOP Apprenticeships provides a unique opportunity for high school and undergraduate students to conduct real-world, Army-sponsored research alongside scientists and engineers in world-class facilities. They inspire students to pursue further education and careers in STEM and demonstrate the importance of research and development. The apprenticeships are run in partnership with The Rochester Institute of Technology.

CAMP INVENTION

Camp Invention is a weeklong summer adventure with activities that explore connections in science, technology, engineering and innovation. Throughout the week, children rotate through various modules that encourage them to work together, seek solutions to real-world problems and sharpen critical 21st century skills. The program is run in partnership with the National Inventors Hall of Fame (NIHF).

JUNIOR SOLAR SPRINT

Junior Solar Sprint (JSS) is a competition for fifth to eighth-graders to create the fastest, most interesting and best crafted solar-vehicle possible. Students will design, build and race solar-powered cars using engineering skills and principles of science and math. They develop teamwork and problem-solving abilities, investigate environmental issues and gain hands-on STEM skills

along the way, too. The competition is run in partnership with the Technology Student Association.

UNITE

Unite is a pre-collegiate summer experience for high school students held at higher education institutions across the country. Unite encourages students to pursue college majors and careers in engineering and other STEM-related fields through a program of focused hands-on rigorous academics, enrichment and career exploration. The program is run in partnership with the Technology Student Association.

RESEARCH EXPERIENCES FOR STEM EDUCATORS AND TEACHERS

Research Experiences for STEM Educators and Teachers (RESET) provides an opportunity to get summer research experience at participating Army Laboratories and Centers. This enrichment reinforces teachers' content knowledge through research experience and interactions with Army and DOD scientists and engineers. Teachers can translate this knowledge and experience into enhanced STEM research curricula for their classrooms, resulting in deeper learning for their students. The program is administered by Tennessee Tech University.

The goal of the AEOP is to provide both students and teachers a collaborative, cohesive portfolio of Army-sponsored STEM programs.



EARLY EXPERIENCE

The AEOP Apprentice program allows high school and undergraduate students to conduct real-world research alongside scientists and engineers.

of Technology, the AEOP partner who administers the apprenticeships, created a college credit-bearing course for students who applied for an apprenticeship. Participants will have the chance to take an online course. Though AEOP looked different this year, the commitment to building and diversifying STEM education and careers remained a unifying theme.

CONCLUSION

With help from AEOP and its partners, educators and students are gaining access to experiences, resources and social capital that will shape the next generation of STEM innovators and leaders, despite the circumstances limiting access to in-person education due to the COVID-19 pandemic.

The need for STEM literacy—the ability to understand and apply concepts from science, technology, engineering and mathematics in order to solve our own day-to-day and even our nation's most complex problems—is growing exponentially. Through AEOP, the Army continues its long tradition of advancing STEM education by preparing the students of today to solve the challenges of tomorrow.

For more information on the AEOP, go to: ***https://www.usaeop.com/about/.***

JACK MEYER is a STEM and workforce senior analyst with Credence Management Solutions supporting the Office of the Deputy Assistant Secretary of the Army for Research and Technology. He supports the Army Educational Outreach Program (AEOP), which provides students and teachers a collaborative, cohesive portfolio of Army-sponsored STEM programs that effectively engage, inspire and attract the next generation of STEM talent with kindergarten through college programs and expose them to DOD STEM careers. The AEOP reaches over 28,000 students and teachers each year.



LOCK AND KEY
All Army employees, military and civilian, are charged with protecting classified information. But problems can arise from trying to promote full and open competition while also protecting classified information. (Images by Getty Images/iStockphoto)



ON CONTRACTING

THE FALLACY OF COMPROMISE

What to do when national security collides with full and open competition for federal contracts.

by Dennis P. Longo

The fifth 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.

Information owned by or under the control of the U.S. government may be classified to protect national security only if its unauthorized disclosure could reasonably be expected to cause identifiable or describable damage to the national security.

Unauthorized disclosure is the publishing or distribution by other means an agency's needs of classified information. According to a July 20, 2020, memorandum from the secretary of defense, unauthorized disclosures jeopardize our DOD personnel, operations, strategies and policies to the benefit of our adversaries. Unauthorized disclosures also distract from mission priorities by redirecting the attention and resources of military commanders. Whether poor operations security (OPSEC) takes the form of careless cyber hygiene, "loose talk" among colleagues, or the willful release of non-public information, the result is the same: unnecessary and increased risk of harm to our fellow Americans and our mission. Such disclosure is a violation of various U.S. government regulations.

Yet, full and open competition is the rule of the Competition in Contracting Act (CICA) when soliciting offers for government contracts. Implementing CICA reduces costs, stimulates commercial innovation and promotes small business participation. CICA requires the use of competitive procedures in obtaining federal contracts unless an exception applies.

Restricting competition based on the national security exception to full and open competition, permissible under CICA and implemented at Federal Acquisition Regulation (FAR) 6.302-6 "National Security," applies when disclosure of the government's needs would compromise the national security. In addition, the statutory exception requires agencies to request offers from as many potential sources as is practicable.

Protection of classified information is a responsibility that dominates all Army employees, both military and civilian. Yet promoting full and open competition and limiting competition to protect classified information can be problematic.

Of particular concern to acquisition officials is the disclosure of classified information to commercial sources. That disclosure must be properly authorized to satisfy the government's requirements when classified information is fundamental to contract performance. Acquisition officials must articulate the government's needs without ambiguity to solicit offers from as many potential sources as is practicable and, at the same time, protect our nation's secrets from unauthorized disclosure.

Competition may be limited only to the extent necessary to satisfy the needs of the agency or as authorized by law.

When soliciting offers for the government's procurement needs, competition may be restricted, according to FAR 6.302-6, to one or a limited number of sources when *the disclosure of the agency's needs would compromise the national security unless the agency is permitted to limit the number of sources from which it solicits bids or proposals.*

There are several questions that the acquisition professional needs answers to: What constitutes a compromise of national security when soliciting the government's procurement needs? What security requirements would be violated if disclosure of the government's needs would compromise national security? What information is "classified" for purposes of soliciting bids or proposals? And, since the national security exception requires agencies to request offers from as many potential sources as is practicable, should disclosure of the government's classified procurement requirements be released to any potential offeror that possesses a clearance level equivalent to the information being disclosed?

1. What constitutes a compromise of national security when soliciting the government's procurement needs? *(It's worth remembering that if it's not classified, there is no compromise. Acquisition documents often claim information is classified without providing supporting evidence. The decision cited below emphasizes that point.)*

We've established that a compromise of national security occurs when the nation's classified information is knowingly, willfully or negligently disclosed.

When soliciting offers for the government's procurement needs, the contracting officer must determine whether prospective offerors will require access to classified information. Information cannot be classified simply to restrict competition. The information, then, first must be classified in order for a compromise of national security to occur.

It is a fallacy to assume that the government's needs should be classified merely because it appears that releasing it would compromise national security.

In 1986 the Marshals Service initiated a procurement to obtain equipment capable of detecting weapons and explosives to be placed in federal buildings and courthouses throughout the U.S. The contracting officer for that procurement executed a justification and approval for other-than full-and-open competition under the national security exception because he believed that disclosure of the government's needs in that procurement would threaten national security. The contracting officer then issued the unclassified solicitation to a limited number of firms. A protest to the then-General Accounting Office (GAO, now the Government Accountability Office) soon followed

In B-224258, Feb. 4, 1987, 66 COMP. GEN. 228, GAO found that the contracting officer unnecessarily relied on the national security exception because the solicitation included the required performance capabilities as well as the salient characteristics of the detection equipment that was being procured. The GAO concluded that the disclosure of the procurement to other firms would not have compromised the national security.

It is a violation of procurement regulations to restrict competition based on the national security exception when the information necessary for contract performance

does not compromise national security. Indeed, information necessary for contract performance must be classified in order for the national security exception to apply.

2. What security requirements would be violated if disclosure of the government's needs would compromise national security? *(The security classification guide conforms to classification requirements and standards contained in AR 380-5 and DOD regulations.)*

The FAR's national security exception applies when disclosure of the government's needs would violate security requirements.

Numerous regulations and manuals address security requirements. For example, DOD Instruction (DODI) 5200.01 requires national security information to be classified, safeguarded and declassified in accordance with DOD Manual 5200.01. According to DOD Manual 5200.01, information shall be classified only when necessary in the interests of national security. Those accessing classified information must have the appropriate security clearance and a valid need to know in performance of a lawful and authorized governmental function. DODI 5200.01 requires that classified information released to industry must be safeguarded in accordance with DODI 5220.00. The FAR 4.403(a) requires contracting officers to review all proposed solicitations to determine whether access to classified information may be required by offerors.

What is the primary document (authority) that identifies the conditions for releasing classified information without violating security requirements?

A security classification guide is the primary document that identifies the specific government-owned information that must be protected from unauthorized disclosure to protect the national security. Each system, plan, program, project or mission involving classified information, according to Army Regulation (AR) 380-5, needs a security classification guide. The guide conforms to standards contained in AR 380-5 and DOD regulations issued under DODM 5200.01, Volume 1.

The security classification guide identifies specific items or elements of information to be protected and the classification level to be assigned each item or element.

3. What information is classified for purposes of soliciting bids or proposals? *(Some portions of the requirement may be classified and some not based on the security classification guide.)*



KEEP IT CLASSIFIED
Unnecessary and increased risk of harm to our fellow Americans can result from careless cyber hygiene, "loose talk" among colleagues, or the willful release of non-public information.

Of primary concern to acquisition officials is the authorized disclosure of classified information to commercial sources to satisfy the government's requirements when classified information is fundamental to contract performance. How does an acquisition official identify information that is classified? What documentation is available to confirm that the government's procurement needs are classified and at what level? Who is responsible for classifying the government's procurement needs?

To establish safeguards to protect against unauthorized disclosure of that information, the government must classify the information that it seeks to protect. The authority to classify information may be exercised only by specifically authorized individuals, usually by an "original classification authority." The security classification guide communicates the decision by that authority to designate certain information as classified, at a particular level and for a particular duration of time.

That document establishes classification guidance issued by an original classification authority that identifies the elements of information regarding a specific subject that must be classified, the associated classification level, e.g., confidential, secret, top secret, and the duration of classification for each element.

A particular government procurement requirement may include both classified and unclassified specifications or elements that describe the government's procurement need. The guide will identify those specifications or elements that must be protected from unauthorized disclosure.

The justification and approval (J&A) documents the decision to limit full and open competition for federal contracting opportunities. To demonstrate that disclosure of the government's needs would compromise national security, the J&A must identify the applicable security classification guide by title and date. To address the FAR's national security exception, the J&A must explain that restricting disclosure of the specific classified information is necessary to protect the national security.

Competition must not be limited merely because the acquisition is classified, or merely because access to classified matter will be necessary to submit a proposal or to perform the contract. Competition may be limited only to the extent necessary to satisfy the needs of the agency or as authorized by law. Consistent with the provisions of the security classification guide, the contracting officer must describe the government's procurement needs in such a way that the solicitation would not disclose the nation's secrets or compromise national security in order to promote full and open competition.

4. How should a potential offeror obtain and protect the government's classified procurement requirements? *(There's no substitute for understanding what it means to "need to know.")*

Acquisition officials must articulate the government's need to prevent divulging the nation's secrets and, at the same time, must solicit offers from as many potential sources as is practicable. The national security exception to full and open competition in the FAR requires agencies to request offers "from as many potential sources as is practicable under the circumstances."

Unquestionably, many interested contractors may have the personnel and facilities authorized to receive classified information and may concurrently be actively engaged in performing similar, highly classified work, perhaps at levels far higher than the classification level applied to the government's requirement.

When a potential offeror requires access to classified information, the contracting officer must ensure that the solicitation contains a draft Department of Defense (DD) Form 254, "DOD Contract Security Classification Specification", the "Security Requirements" clause at FAR 52.204-2, as well as detailed instructions to potential offerors on how they may request access to the classified information.

The government uses the DD Form 254 to convey security requirements to contractors when contract performance requires access to classified information.

The "Security Requirements" clause at FAR 52.204-1 requires the successful contract awardee to comply with the DD Form 441 "Security Agreement" and the "National Industrial Security Program Operating Manual," DOD 5220.22-M.

5. Should possession of the required personnel and facility clearances permit an individual or entity unconditional access to classified procurement information?

In 2016 the Air Force issued a classified justification and approval for award of a sole-source contract to L3 Technologies based on FAR 6.302-6. The Boeing Co. challenged the Air Force's justification and approval in a protest to the GAO, arguing that the rationale for citing the national security exception in the justification and



TO KNOW OR NOT TO KNOW
Possession of a clearance does not automatically constitute the need to know. Justification and approval must explain the need-to-know restriction when access to classified information is fundamental.

Full and open competition is the rule of the Competition in Contracting Act when soliciting offers for government contracts.

approval unreasonably relied on a finding that the classified information to which L3 has access could not be shared with other contractors. Boeing pointed out in its protest that it had the personnel and facilities to receive the classified information and further pointed out that classified work it had performed for the government on previous contracts involved information classified at levels far higher than the secret level applied to the levels applied to the justification and approval.

The GAO denied Boeing's protest regarding the justification and approval, concluding that the Air Force reasonably made a need-to-know determination that precluded the transfer of classified information to an additional contractor. See B-414706; B-414380.2, Aug 25, 2017.

Persons are allowed access to classified information only if they (1) possess a valid and appropriate security clearance, (2) have executed an appropriate nondisclosure agreement, (3) have a valid need to know the information in order to perform a lawful and authorized government function. According to AR 380-5, Army personnel are personally responsible for determining that all three are true.

It is a fallacy to believe that just because someone has a clearance means they have a need to know. Need to know is a determination made by an authorized holder of classified information that a prospective recipient requires access to specific classified information in order to perform or assist in a lawful and authorized governmental function.

Need-to-know provisions may preclude the clearance of additional sources for the purpose of solicitation and performance of work, even to those sources that might possess access to information classified at equivalent or higher levels on other programs.

When limiting competition based on the national security exception and need-to-know provisions apply, the justification and approval must explain the need-to-know restriction when access to classified information to commercial sources is fundamental to contract performance and disclosure of classified information is limited on a need-to-know basis.

CONCLUSION

Fallaciously invoking the national security exception to limit full and open competition comes with risk of expending agency resources and delays in awarding and executing contracts.

Limiting competition for federal contracting opportunities based on national security isn't solely a matter of keeping secrets safe, but by recognizing what actions or omissions may or may not constitute a compromise of national security when soliciting for the government's procurement needs.

The security classification guide is the primary document that identifies and regulates disclosure of classified information for purposes of soliciting bids or proposals. Understanding need-to-know requirements before disclosing the government's classified procurement requirements will avoid an unlimited and unauthorized release of classified information to any potential offeror that may possess a clearance level equivalent to the information being disclosed.

For more information, view the Competition in Army Contracting course at ***https://go.usa.gov/xvy7z****. This site requires a Common Access Card.*

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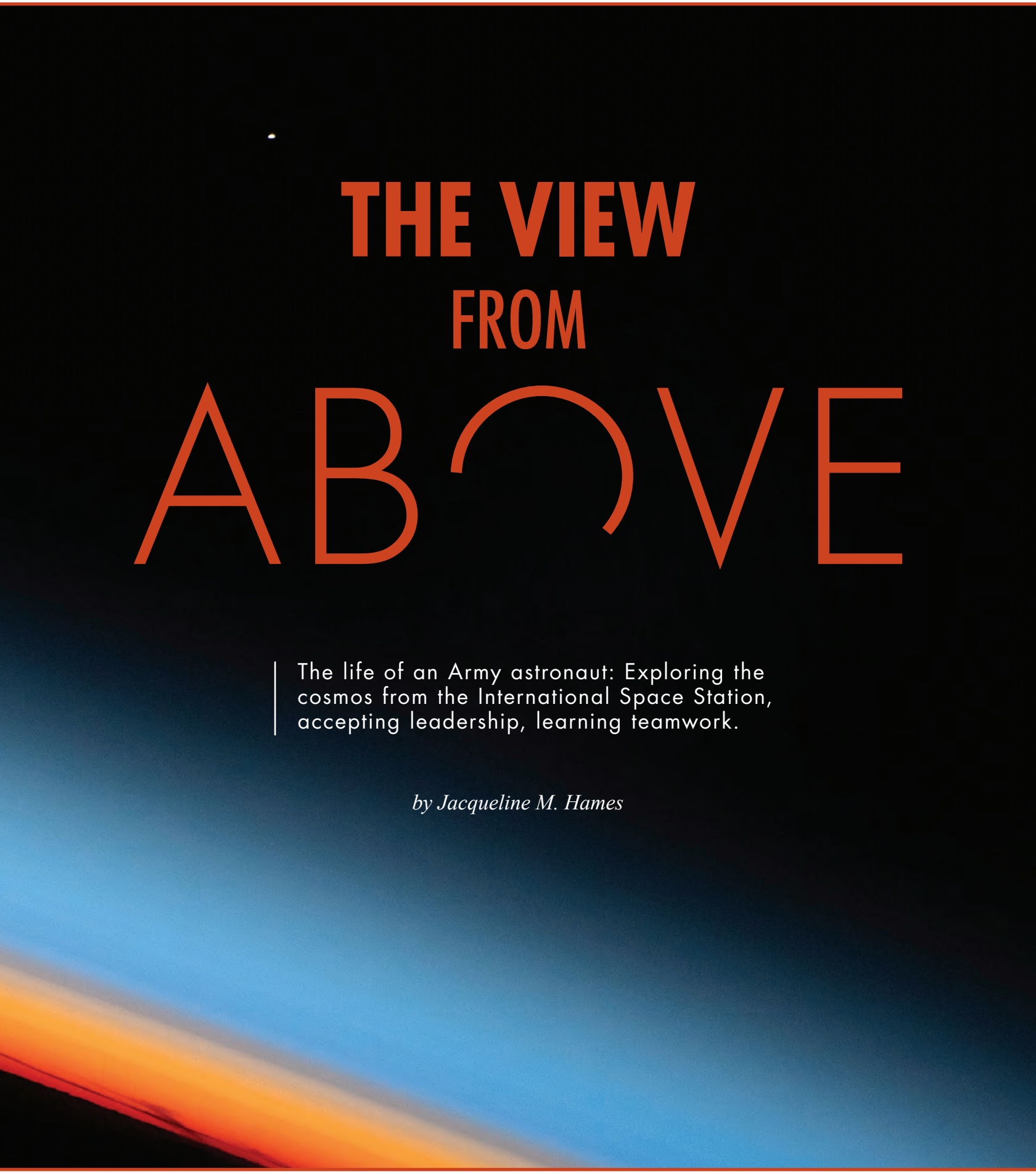
SUNRISE ON THE HORIZON
The first rays of an orbital sunrise illuminate the edge of the Earth's atmosphere in January 2020, creating a glowing arc as the ISS orbits 259 miles above the central United States. (Photos courtesy of NASA)



THE VIEW FROM ABOVE

The life of an Army astronaut: Exploring the cosmos from the International Space Station, accepting leadership, learning teamwork.

by Jacqueline M. Hames

Picture the sunrise and sunset in fast-forward. Watch the moon jump over the horizon and then disappear again—watch the twist of a hurricane, or the slow creep of a Saharan dust cloud across the ocean. International borders vanish and the inhabitants of the planet all become one race: human.

This is the perspective astronauts have from the International Space Station (ISS), according to Lt. Col. Anne McClain and Col. Andrew Morgan, M.D., Army officers and astronauts themselves. Of course, attaining this magnificent view requires personal dedication, a background in science, technology, engineering and mathematics (STEM), and a team of people—from ground staff to scientists to other astronauts—from across the globe.

FLIGHT CLUB

NASA's astronaut crew selection process has always been secretive, and many people never discover the reason they were chosen to fly. To apply for the job, however, the only requirements are U.S. citizenship, a master's degree in a STEM field and two years of related professional experience. This allows people with diverse backgrounds the opportunity to go to space, and McClain and Morgan are no exceptions. Both are graduates of the United States Military Academy at West Point, and both have illustrious careers as Army officers, but that's where the similarities end.

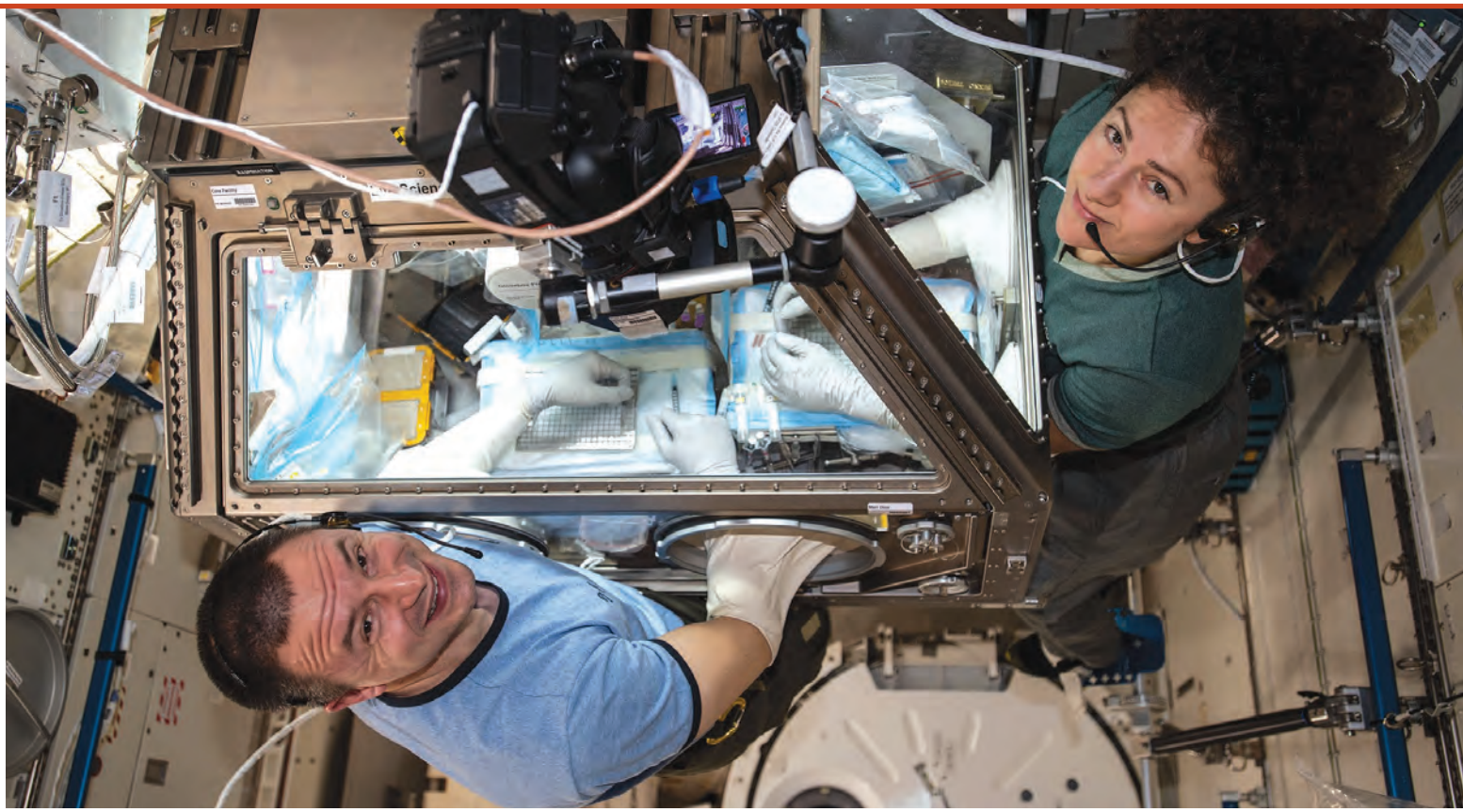
Morgan jumped with the "Black Knights" parachute team while at West Point, is board certified in emergency medicine and served as the battalion surgeon with the 1st Battalion, 3rd Special Forces Group (Airborne) "Desert Eagles." He was assigned to special operations forces and was deployed to Iraq, Afghanistan and Africa. McClain has an M.S. in aerospace engineering and an M.S. in international relations. As an Army senior aviator, she has more than 2,000 flight-hours in 20 different aircraft—and 800 of those hours were in combat, supporting Operation Iraqi Freedom.

"Much like Lt. Col. McClain, I am a Soldier first—both of us believe that very strongly—we've both of us made that decision first, to go to West Point and be an officer and become a leader of character," Morgan said. Many aspects of his background come in handy as an astronaut, but none more than the idea of selfless service. "That's a fundamental part of being a leader—it's also very inherent in being a physician, and, as it turns out, it's also really important in being a good astronaut, to be a good



BLACK KNIGHTS IN SPACE

Army astronauts Col. Andrew Morgan, M.D., and Lt. Col. Anne McClain speak with Army AL&T during a Microsoft Teams interview on Sept. 23. Both were graduates of the U.S. Military Academy at West Point, though their careers diverged from that point.



THE GRAVITY OF THE SITUATION

Morgan and NASA astronaut Jessica Meir conduct research operations inside the Japanese Kibo lab module's Life Sciences Glovebox in November 2019. The Expedition 61 flight engineers were studying mice for the Rodent Research-14 investigation, which observes how microgravity affects the body on a cellular and organ level.

team leader, team player and member of a team," he said.

"A big part of what makes this mission work at NASA is that everybody contributes," McClain explained. "But everybody also is ready to step back and take the lead from the person next to them. It's kind of this constant movement between being a leader and a follower, and you really have to step away from any ego."

That collaborative attitude is what makes everything work—on the ground, in flight and on the ISS. Much like the overarching acquisition process, space exploration needs all of its metaphorical moving parts to work together as seamlessly as possible to achieve the mission: Shuttles must be designed, bought and tested; flight crews trained; scientific experiments planned for and taught to the crew; ground staff prepared for the mission; and of course—the exciting part for us outside observers—the rocket launch. An untold amount of work goes into that achievement (much like delivering a new piece of equipment to Soldiers) and these collaborations reach global proportions, now more than ever.

"This is an extremely exciting time for space on many levels. We're seeing that we're at what's described as an inflection point here," Morgan said. The inflection point has three parts: civil space, which is national space programs like in NASA or the European Space Agency; commercial space, as with SpaceX and Boeing and other companies that "put hardware into low-Earth orbit;" and finally, defense space—specifically, the United States Space Force. "All of these things coming together is great for … space exploration," he said. "We're really looking at an exciting decade ahead."

She recalled one of her spacewalks,holding on to the ISS by a handrail and looking down at the blue and green orb of Earth.

INNOVATION WITH INDUSTRY

"Over the last 50 years, NASA has done a lot of research on rockets … on living in space, on working in space, on satellite repairs, on all these great things," McClain said. "And now it's our job to share that with commercial entities within the United States and let them take that research and make it even better, and make it more accessible and do more research than what NASA does in and of itself." About 10 years ago, NASA wrote contracts for commercial companies to develop space flight systems that would bring astronauts to the ISS, she explained. Boeing and SpaceX were among the businesses that stepped in to fill that need. Now, NASA has completed two manned flights on the SpaceX Dragon vehicle—the most recent on Nov. 14—and Boeing will conduct another unmanned test flight of the Starliner vehicle in the first quarter of 2021, in preparation for crewed flights to the ISS later in the year.

In fact, these partnerships are an integral part of NASA's plans for the future—not just in transporting astronauts back and forth from the ISS, but also in putting another crew on the moon and exploring deep space. "For the first time in NASA's history we have astronauts training and trying to fly on four different vehicles," McClain said—the SpaceX Dragon, the Boeing Starliner, the Orion space craft, and, of course, the Russian Soyuz. NASA is designing and building the Orion in partnership with Lockheed Martin as part of the Space Launch System (SLS) rocket—the most powerful in the world, according to NASA—for deep space exploration as part of the Artemis program.

The Artemis program aims to land the first woman and the next man on the moon by 2024 for further exploration of the lunar surface. On Dec. 9, 2020, astronauts were selected for the Artemis Team—McClain among them. She said, "We're not just going

"I feel a burden, a responsibility to say, to kind of spread that word and say, look what we can achieve when we do something together."

WALK, RUN, FLY

"STEM is a full-contact sport," said Maj. Karoline Hood, engineer and space operations officer. She told her math students at the U.S. Military Academy at West Point that very thing when she was teaching—STEM is something she's passionate about.

And that passion has seen her through 14 years with the Army. "I've had pretty much all the kind of standard Army jobs—platoon leader in Iraq, company commander in Afghanistan, battalion S-4 [logistics] job," she said. "I've also had some pretty unique assignments as well." She's worked with the U.S. Army Corps of Engineers Seattle District and is now a project engineer stationed at the Army NASA Detachment at the Johnson Space Center in Houston. She considers her job at the space center one of the more unique roles she's had, in that she helps support human space flight as a space operations officer.

Functional Area 40—space operations—is part of the Army's larger space capabilities, and these capabilities are more extensive than you think. The Army is the largest user of space-based capabilities in DOD. Space-based GPS, communications, weather and intelligence collection platforms—like satellites—are critical for maintaining situational awareness and to protect and sustain the force. Space is "ingrained into every aspect of Army ground operation," according to the U.S. Army Space and Missile Defense Command (USASMDC), from weapons to maneuverability. USASMDC is responsible for most of the Army space enterprise—including the development of space operations officers and providing NASA with astronauts. It is home, specifically, to the Army Space Personnel Development Office (ASPDO) in Colorado Springs, Colorado—where the space operations officers are trained.

"We are a pretty small group," Hood said. "The basic rule of an FA40 officer is to utilize and integrate space capabilities with terrestrial-, sea-, air- and high altitude-based systems owned and operated by the DOD, the [intelligence] community, civilian agencies and commercial partners." In other words, space operations officers figure out what the warfighter's mission is and then integrate space capabilities within that mission, she explained.



DRESS REHEARSAL

Maj. Karoline Hood, left, visited the Neutral Buoyancy Lab with Army astronaut Col. Drew Morgan, second from left, and fellow space operations officer Lt. Col. Adam Springer, right. Morgan was preparing to practice a simulated extravehicular activity, or spacewalk. (Photos courtesy of Maj. Karoline Hood)



SIRI, BUT FOR SPACE

Hood attended the Space Symposium in Colorado Springs, where she interacted with a mockup of "CIMON," the Crew Interactive Mobile Companion. CIMON is an AI robot that has been used on the International Space Station.

As a project engineer, Hood facilitates and provides technical reviews on space systems and hardware—including preparing spacecraft for flight—and supports launches and landings. That means she works closely with companies like SpaceX and Boeing to ensure vehicle safety. Hood ensures companies are meeting contract requirements, identifying variances in those requirements and getting them approved, and she is responsible for the overall certification of a spacecraft in all phases of flight. "One of the vehicles I am working on right now is going to be launching astronauts in the spring timeframe, and it's a SpaceX Crew Dragon vehicle that has already flown," she said. "We're in the process of refurbishing it, and so one of my jobs is following it through the refurbishment process." All transportation vehicles in the Commercial Crew Program, like the Crew Dragon, must be certified to meet NASA requirements.

Preparing a spacecraft for flight usually culminates with a crew equipment integration test, Hood explained, during which the crew validates all the different interfaces, like seat rotation, hatches and spacesuit umbilical connections. During such a test, she also ensures astronauts are also able to inspect the vehicle before it is launched and uses their feedback to help improve the capsule. For example, they are required to ensure there are no sharp edges that could puncture a pressurized spacesuit, or to add Velcro in certain places for placement of various emergency cue cards, she said.

"I've had some pretty unique assignments."

As a project engineer, Hood facilitates and provides technical reviews on space systems and hardware and supports launches and landings.

In February 2019, Hood conducted unassisted crew egress rescue testing. The NASA-led test used a mock capsule, called a boiler plate, and took place in the Neutral Buoyancy Lab at the Johnson Space Center. The crew practiced escaping the vehicle onto a life raft during a water landing. Hood and her team validated procedures and tested radios, personal locator beacons and life raft deployment—all to ensure the vehicle is safe.

Later that year, Hood assisted Boeing with the landing and recovery operations during the December orbital flight test of the Boeing CST-100 Starliner vehicle. The Boeing-led test sent the Starliner vehicle into space—launched from the Kennedy Space Center in Florida—and then landed it a few days later in White Sands, New Mexico, Hood said. She was on site to help with post-landing recovery operations.

Space operations officers can have a wide range of jobs. They are integrated into the planning and operations positions at all organizational levels that, according to ASPDO, "influence, shape, research and develop, and acquire space-related capabilities."

Getting to space isn't an easy task, and once you get there, everything about it is trying to kill you. So, before you look up, remember to look around—the task begins here, with people just like Hood.

—JACQUELINE M. HAMES



LAUNCH BREAK

Hood toured the Kennedy Space Center in Florida, where she saw the mobile launcher platform, which is used to support large multistage space vehicles. The space vehicle is assembled at the vehicle assembly building and then transported to the launch pad.



HOUSTON, DO YOU COPY?

Morgan, left, Springer, center, and Hood visited the Mission Control Center in Houston.



A NEW ERA
The SpaceX Dragon cargo craft approaches its capture point 10 meters from the ISS in May 2019, with the Canadarm2 robotic arm poised to reach out and grapple the resupply ship.

"Being the only three people off the planet who were truly protected from the pandemic, and then being dropped back down in the middle of it, really helped us reflect about how fragile of a planet we live on."

there to put a boot on the moon. We're going there as part of an international conglomeration of countries to build a sustainable presence on the surface of the moon to learn how to do that for future deep space missions, like to Mars." NASA is hoping the first crewed mission in the Artemis program will happen in the next couple of years, McClain added—it will be a flight of the Orion on the SLS rocket, out and around the moon, to test all the systems. After that is complete, the next mission will be to put a lunar lander on the moon's south pole, she said.

BODIES IN MOTION

Astronauts learn a lot about life on Earth by going to space—and, occasionally, terrestrial life informs behavior in space. Life on board the ISS is a bit like camping, Morgan said—you're not quite taking a shower, or brushing your teeth at the sink, but rather finding creative ways to wrangle water (and other liquids) in microgravity. Astronauts also have to keep their bones and muscle mass from deteriorating while in space, which they do through regular exercise. Over time, such exercises have nearly eliminated all the bone loss astronauts had previously experienced, McClain

said. "We still have some bone loss throughout a mission, but nothing comparted to what we saw in the early days," she said.

The effects of microgravity on the human body are a significant part of what astronauts are studying while on board the space station. "When we talk about how we're going to get to Mars, folks really focus on [which] vehicle we're going to be in, but the other questions that a lot of people are asking is, 'How is this going to effect the human body?' " McClain said. "What's our body going to be like when we get to Mars and we're back in a gravity environment? What does that do to us long term?" Right now, it takes just under 24 hours to reach the ISS, and expeditions usually last about six months. In comparison, NASA projects that manned Mars missions will be about three years in duration—so learning how the human body reacts to microgravity and space flight is paramount for success.

In 2019, both Morgan and McClain were subjects for an ongoing vascular echo study that took place preflight, while in space and when they returned to Earth. The study charted how the different pressures throughout the body affect the way blood moves and the way the arteries expand and contract with your



STORMY OUTLOOK
Tropical Cyclone Idai is pictured from the ISS in March 2019 as the orbital complex flew 261 miles above the southeast coast of Africa. Idai's track took it over the Mozambique Channel and portions of the nations of Madagascar, Mozambique, Malawi and Zimbabwe, creating devastation and casualties in the southeast portion of the African continent.



FAR OUT PHOTO
McClain takes a break inside the ISS's cupola while practicing Canadarm2 robotics maneuvers and Cygnus spacecraft capture techniques in April 2019.

While aboard ISS, astronauts can see radiation as they sleep.

"It looks like a shooting star across your eyes. When you're going to sleep you'll get a flash that looks like a shooting star across your eyeball," Lt. Col. Anne McClain said.

"I had heard about that beforehand, luckily, because it would have been concerning," said Col. Andrew Morgan.

Free floating in microgravity has some odd side effects, like where your callouses appear.

"We do get callouses and buildup in places we would not normally on Earth," Morgan said. "Like on the tops of our feet, our big toe, which we use all the time to anchor ourselves to handrails and straps and things that we find because we want to have our hands available to us while we're working, so we always use our feet to hook on to stuff, and as a consequence, the tops of our feet ...get the calluses."

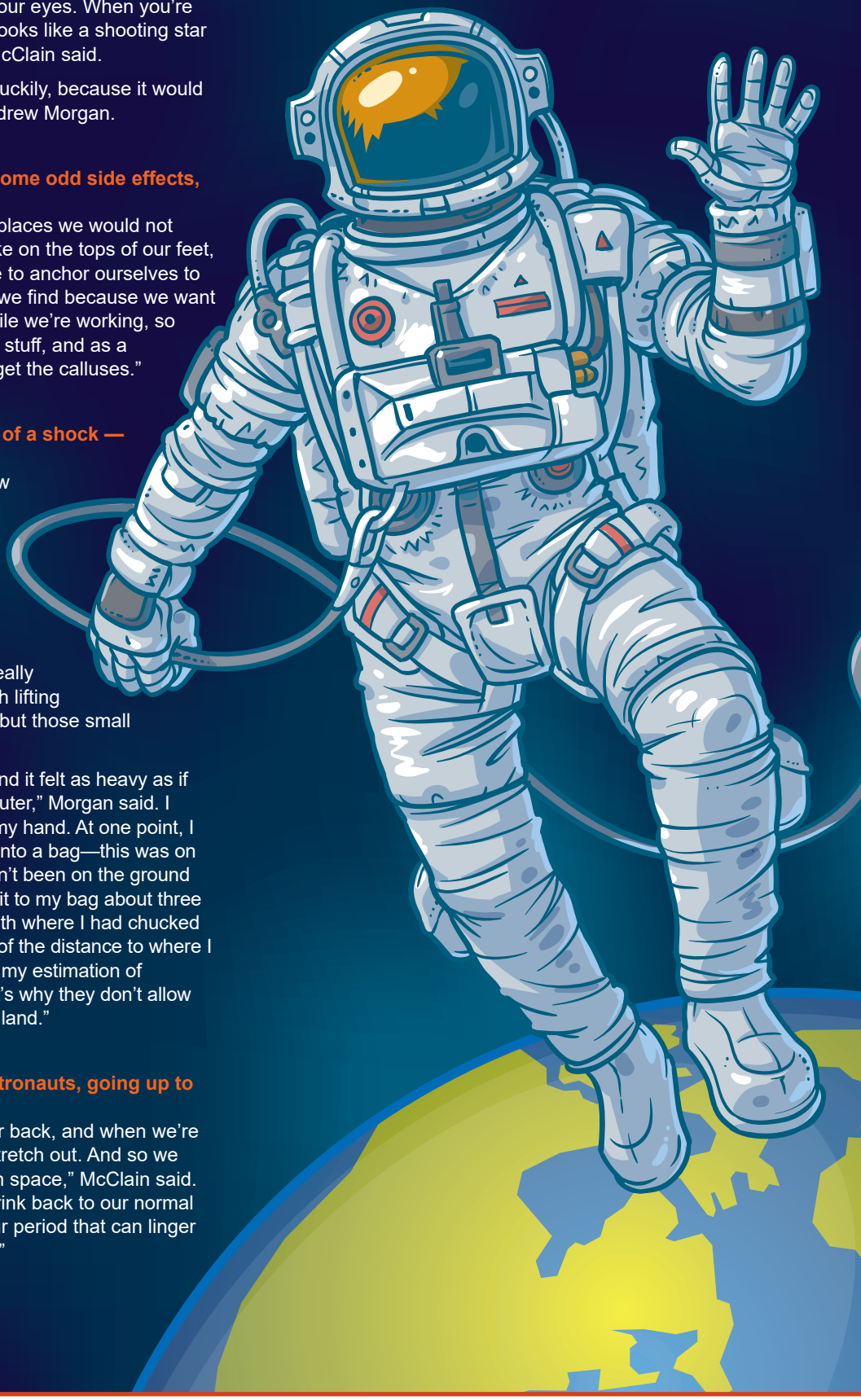
Coming back to Earth can be a bit of a shock — gravity is a cruel mistress.

"What was actually shocking was how strong of a force gravity is," McClain said. "Even though for 39 and half years of my life I lived with it, I was so shocked at how heavy my clothes felt. How heavy my watch felt. My watch felt like it was pulling my wrist down. The small stabilizing muscles kind of deteriorate—we're really good at keeping our big muscles, with lifting and exercising on the space station, but those small stabilizing muscles go away."

"Someone handed me a cellphone, and it felt as heavy as if they had handed me a desktop computer," Morgan said. I couldn't believe how heavy it was in my hand. At one point, I was sitting down and I tried to toss it into a bag—this was on the airplane flying me home, so I hadn't been on the ground for 12 hours yet—and I tried to throw it to my bag about three feet away—[it fell] immediately beneath where I had chucked it. So I hadn't even made it a quarter of the distance to where I intended to. Not just my strength, but my estimation of trajectory. Everything was all off. That's why they don't allow us to drive for a week or two after we land."

Growing pains are common for astronauts, going up to the ISS and coming home.

"We have a lot of squishy parts in our back, and when we're not weighted down by gravity, they stretch out. And so we grow one to two inches while we're in space," McClain said. "When we come back, we kind of shrink back to our normal size in a kind of painful 24- to 48-hour period that can linger longer or shorter for different people."





heartbeat. "[It] looked at [how blood flows], how does our physiology change when living in microgravity for a long period of time, and does that potentially have an impact on our brain and subsequently affect how our vision changes," Morgan said. "We do see some vision changes in long-duration space flight that we do need to understand." Morgan was the final subject in that particular study, and the results are currently being analyzed.

The type of science experiments conducted aboard the ISS span a wide range of fields—from physics to engineering to biology, among others. Some of those experiments are contained to one particular mission, while others go on for years, Morgan said.

"There are two broad categories of experiments that are on the ISS," he explained. "There are those that we interact with directly, and then there are a lot of experiments that are installed after—maybe we install [the experiments] and then they run themselves, or they are on the exterior of the station, and it's just sort of set it and forget it, we don't interact with it routinely." For example, the alpha magnetic spectrometer—a particle physics detector that looks for dark matter, antimatter and missing matter from a module on the outside of the ISS—has been around for the last decade, and it usually works just fine on its own. While Morgan was aboard the space station, the spectrometer was experiencing some trouble with its thermal control pump, and he participated in a spacewalk to correct the problem.

"That's an example of something where we don't expect to have to do that, but we're prepared to in case we need to," Morgan said. "In terms of the experiments on the inside of the station, those are always working closely with the ground team. They put a lot of time and effort in to make sure that it is as simple for us to do in space as possible, so that even though we're not experts, they make us feel like part of the team and have some expertise." Of course, Morgan said, they have to be extremely careful when handling these experiments, as years of research have gone into them before they ended up in space.

"An example of a study that was completed [in the time] I was onboard was just recently published in a journal—I believe it was

FIRST TIME OUT

McClain, at top in her white U.S. spacesuit with red stripes, is tethered to the ISS's Port-4 truss structure during a six-hour, 39-minute spacewalk in March 2019 to upgrade the International Space Station's power storage capacity. This was the first spacewalk for McClain and fellow astronaut Nick Hague (out of frame).



A NEW VIEW OF NEW MEXICO
Morgan, the Expedition 62 flight engineer, inside the ISS's "window to the world," the cupola, in April 2020. The orbiting lab was flying above the state of New Mexico.

called the Mighty Mouse study—and that looked at providing a treatment to mice that blocked a pathway that normally inhibits bone and muscle growth," Morgan said. Blocking the pathway allowed the bones and muscles of the mice to grow larger and denser than usual. "That was very interesting because [that treatment] is something we could potentially see as a countermeasure for the effects of living in space for a long time, but also has information for how we treat muscular, muscle and bone diseases on Earth as well," he added. The experiment, officially called Rodent Research-19, had its result published in the Proceedings of the National Academy of Sciences of the United States of America in September.

Because the ISS is an international venture, astronauts can't just while away the days experimenting with scientists in the United States—they also have to navigate international relations. However, being in space provides an interesting perspective for diplomacy, and it isn't as difficult as you might think.

"The international aspect is something that is one of my favorite parts of working on the space station," McClain said. She emphasized that both she and Morgan flew on the Soyuz spacecraft from Kazakhstan—she in 2019 and he in 2020—and that her own flight crew had Canadian and Russian personnel. When she arrived on the space station, there were three astronauts already on board: German, Russian and American. "Our crews are very international but, interestingly, what I enjoy most about that day-to-day is that we don't really think about it," she said. "We know them on a human level, a person-to-person level. They know us, we know their families, they know our families, and these are our coworkers and our friends all across the world. To me what it's done is that it has made the world a little bit smaller."

McClain often likes to flip the question of international politics on its head. Rather than politics informing the relationships of those aboard the ISS, she said the relationships between the crewmates should inform the politics. "I feel a burden, a responsibility to say, to kind of spread that word and say, look what we can achieve when we do something together," she said. "Because this is an amazing feat—the International Space Station is the largest manmade thing out there [in space], and it was put together by all these different countries all around the world.... And we launched parts of it from Russia, from Europe, from Japan, from the U.S.,



MIC CHECK, 1-2-3
Morgan shows his Army pride in the Kibo laboratory module, while talking to personnel on the ground in March 2020.



SURGICAL PRECISION
Morgan is tethered to the ISS while finalizing thermal repairs on the alpha magnetic spectrometer, a dark matter and antimatter detector, during a spacewalk in January 2020 that lasted six hours and 16 minutes.

and the first time these components ever touched each other was in space, and it works! And it works well."

"I think it's a fantastic legacy of the program that it will be, probably, one of the most important legacies that we take forward with us in the future programs," Morgan said of the international cooperation aspect.

A UNIQUE PERSPECTIVE

While McClain had returned to Earth well before the COVID-19 pandemic struck, Morgan was still aboard the ISS during the initial wave of the disease. He and two others from his flight crew landed back on solid ground in what he thought was the middle of the crisis, but was actually the beginning.

"Watching that play out and being the only three people off the planet who were truly protected from the pandemic," Morgan said, "and then being dropped back down in the middle of it, really helped us reflect about how fragile of a planet we live on, but also how beautiful of a planet that we live on." The pandemic is an example of something that affects everyone equally, he added. He believes that the collaborative, multinational effort in building and sustaining the ISS for more than two decades illustrates how we, as a global community, can come together to solve problems that affect us all.

"You really do get a different perspective when you're out on the International Space Station, when you're off the planet," McClain said. She recalled one of her spacewalks, holding on to the ISS by a handrail and looking down at the blue and green orb of Earth, which was the biggest thing she could see, other than the ISS. Behind the space station was the infinite expanse of space—the only thing holding her in place was gravity. She realized that



COSMIC PROPORTIONS
A SpaceX Falcon 9 rocket with the company's Crew Dragon spacecraft onboard rolls out of the horizontal integration facility at Launch Complex 39A in November 2020 as preparations continue for the Crew-1 mission at NASA's Kennedy Space Center in Florida.

"this is the only planet we're ever going to have, these people that we're walking the Earth with are the only other people that we're ever going to have on our planet. We have this common mission of taking care of Spaceship Earth."

"I think, if everybody could back up and see that … I think it would put a lot of our problems into perspective," she said.

For more information on NASA astronauts and the Artemis program, go to ***https://www.nasa.gov/****.*

JACQUELINE M. HAMES is an editor with Army AL&T magazine. She holds a B.A. in creative writing from Christopher Newport University. She has more than 10 years of experience writing and editing news and feature articles for publication.

"There are two broad categories of experiments that are on the ISS. There are those that we interact with directly, and then there are a lot of experiments that are installed after—maybe we install [the experiments] and then they run themselves, or they are on the exterior of the station, and it's just sort of set it and forget it, we don't interact with it routinely."



PEACE OF MIND
Teleworking gave many of us peace of mind, knowing we could continue to work while minimizing possible exposure to the coronavirus. (Image by Getty Images)

SOFT SKILLS TO BATTLE A ***TOUGH ENEMY***



The COVID-19 pandemic has forced the Army and nation to fast-forward to innovation, but will the remarkable changes last?

by Dr. Bozena "Bonnie" Berdej

Last March, when COVID-19 hit hard and telework became the new norm, Army leaders wondered if it would work. Secretary of the Army Ryan D. McCarthy said, "The rapid spread of COVID-19 across the globe has spurred many internal discussions concerning the Army's future operating budget." He added that "nothing has had the contagion and the proliferation like we have seen with COVID-19 since the Spanish flu of 1918." Gen. James McConville, the Army chief of staff, emphasized that "COVID-19 has impacted everything we do, but we still have to protect the nation."

The "new normal" had begun, but not without a period of turbulence before things could settle down. Army organizations adapted new procedures to successfully navigate and overcome the unknown. Response plans likely became the No. 1 discussion topic among Army leaders. Soon after, Army leaders realized that the COVID crisis was an opportunity to review the existing strategies and to change the way we do business. In doing so, they identified strengths and weaknesses, and developed effective contingencies as part of future business plans. At the Joint Program Executive



STRONG LEADERSHIP
One of the first things Brig. Gen. Vincent F. Malone did after the pandemic hit was to establish a working group to develop JPEO A&A's COVID-19 Preparedness and Response Plan.



IMPACT TRACKER
Chris Grassano, the deputy JPEO A&A, and other leaders started tracking the impacts of COVID-19 on the industrial base and individual programs.



VIRTUAL TIES
JPEO A&A Chief of Staff John Curran started monthly virtual meetings to allow workers to interact, see each other and boost social connection.

Office for Armaments and Ammunition (JPEO A&A), Brig. Gen. Vincent F. Malone established a working group to develop the JPEO's COVID-19 Preparedness and Response Plan.

"Our working group," Malone wrote, "will continue to refine this document as we develop and implement control measures to minimize the risk of exposure in the workplace. As the Army transitions to operate in a COVID-19 environment, your safety remains our highest priority!" Malone committed himself to provide weekly updates "as we refine our plans for safe operations in a COVID-19 environment."

WHAT DID THE ARMY DO GREAT?

I want to focus on three positive outcomes that resulted from this global pandemic and benefited the Army Acquisition Workforce. Despite the challenging environment, there were considerable opportunities for Army organizations. One such opportunity was to construct flexible procedures including telework and virtual measures. Granted, originally there was no other choice but to telework. As time passed, though, leaders realized that efficiency and effectiveness increased. This was because of several contributing factors. First, for those who could telework, their commute was eliminated and, with that, their traffic frustrations. Did it affect our work input before? My former commute was about 25 minutes, but now and then an accident or an unexplained backup at the gate would double that. Sometimes more. I'd get into the office frustrated and needing to catch up. That hasn't happened now in most of a year.

Our workdays changed. The workday was no longer constrained solely by hours. Instead, while we have to work our regular hours, we can base our approach more on task completion. While this may be good or bad or both, it allowed for greater flexibility when managing tasks. It also reduced stress related to falling behind schedule and coming home late from work. There is also a benefit in reducing commute-related expenses. We like to save money. For me, the elimination of this expense and other aforementioned stressors resulted in greater inner peace and improved efficiency.

SELF-IMPROVEMENT BY TELEWORK

One of the studies I analyzed for my doctoral research, "Emotional intelligence. A catalyst for inspirational leadership

and management excellence," by Parvesh K. Chopra and Gopal K. Kanji, delivered evidence that emotional intelligence is responsible for managing stress through logic, reasoning, planning, learning and thinking. It was likely to improve problem-solving and increase the desire to get involved in organizational objectives. According to the authors, reduction in the level of stress may be linked to increased emotional intelligence, which "has immense significance and relevance for self-emotional management, development of human potential, relationship management at home and work, teamwork … job performance, organizational development, creativity and innovation."

Perhaps the most important benefit of teleworking was the peace of mind many of us had in knowing that we could continue to work and minimize our exposure to COVID-19 at the same time.

Dr. Jarrod Sadulski, faculty member in criminal justice at the American Military University in West Virginia, works with service members and can shed some light on the importance of reducing COVID-related risks. In an article, "Coronavirus: Advice on Teleworking for Servicemembers," he wrote that "by reducing the need to leave home, teleworking enables servicemembers to limit contact with others, thereby slowing the spread of the coronavirus pandemic. In addition to protecting servicemembers and their families, teleworking protects an entire military unit and its workforce," which directly affected the production rate and increased effectiveness.

When Army leaders realized the benefits of teleworking, they made an informed and educated decision to continue with measures that assure everyone's safety and prevent the mission from failing—a decision that counterbalanced the virus effectively and successfully. While COVID-19 has no respect for gender or age, Army leaders have shown increased respect for human dignity and safety by implementing strategies that calmed emotions and eliminated anxieties associated with depression and poor mental health.

RESILIENCE AND STRENGTH

The second great positive was that, in this new environment, creativity kicked in. Army leaders partnered with industry to ensure their organizational health and continuity. I found it fascinating how social we are. We can create a future just by talking about it. People meet and come up with a concept and then make it happen. "Our mission of delivering materiel capabilities to the warfighter is accomplished by the total force, including military, civilian and defense industrial base partners," said Dr. Bruce D. Jette, the assistant secretary of the Army for acquisition, logistics and technology and the Army acquisition executive. Keeping defense companies healthy and well-functioning is critical to achieving our mission. To that extent, Jette made it clear that "the resiliency and strength of our team is a national asset and is critical to our Army's ability to meet mission requirements around the world. We must do what we can to support it."

At JPEO A&A, leaders including Malone, Chris Grassano, the deputy joint program executive officer, and JPEO A&A Chief of Staff John Curran and many others, did exactly that. They started tracking the COVID-19 industrial base and programmatic impacts on a weekly basis to ensure proactivity and support for our industry partners. Throughout this process, we have seen temporary closures resulting from state directions, loss of non-government income, COVID-19 cases in manufacturing buildings, test delays because of travel restrictions, 20 to 30 percent absentee rates in some companies and reduced production. The government teams closely monitored these risks. JPEO A&A teams worked with industry partners to develop response plans and to address existing issues. Midway through the year, we started seeing more potential COVID-19 issues resolved. The rate of success was definitely increasing.

COMMITTED EMPLOYEES

Malone leads JPEO A&A with business in mind. In one of his messages to the JPEO A&A workforce, he emphasized the importance of tracking these impacts and effectively addressing them so we can ensure continued delivery to the warfighter. Malone provided strategic direction and built appropriate organizational infrastructure to guarantee success. At JPEO A&A, we have witnessed not only leadership at its best, but also leadership marked by high emotional intelligence that resulted in increased motivation, production, effectiveness and great teamwork. In an article from Organizational Dynamics in 1985, "Leadership: Good, better, best," Bernard M. Bass talked about leaders who challenge the status quo to improve organizational

Some of us might have even experienced cognitive dissonance while attempting to discern everything 2020 had to offer.

effectiveness. Similarly, in his 1993 article "Transformational Leadership and Organizational Culture," Bass emphasized that such leaders "align others around the vision and empower others to take greater responsibility for achieving the vision … they foster a culture of creative change and growth … they take personal responsibility for the development of their followers."

I believe that our leaders challenged everything about the situation we found ourselves in, but they did it in a way that pulled everyone together, not by force but by commitment.

Ivan T. Robertson and Cary Cooper, in their 2011 book, "Well-Being: Productivity and Happiness at Work," demonstrate that such employee commitment was associated with three elements: work-life balance, well-being and work values that in recent years have become mainstream affecting organizational effectiveness. It was a volunteering effort to support the organization and improve the outcomes. Had we had less capable leaders during these unprecedented times, we probably would be seeing increased numbers in organizational discontinuity. When leaders do not act quickly and effectively, companies are likely not to survive sudden crises. Richard Foster and Sarah Kaplan, in their 2001 book, "Creative Destruction," said that organizational discontinuity happens when companies lose control of present operations during unprecedented waves of creative destruction, while losing their presence in the market. COVID-19 certainly was unprecedented and silently destroyed many companies.

Army leaders have shown increased respect for human dignity and safety by implementing strategies that calm emotions and eliminated anxieties associated with depression and poor mental health.

Would it have made a difference if we'd had a warning? I believe that we had a warning, but the pandemic would still run its course, forcing waves of creative destruction on organizations across the country. At the end, emotionally intelligent leaders pulled through.

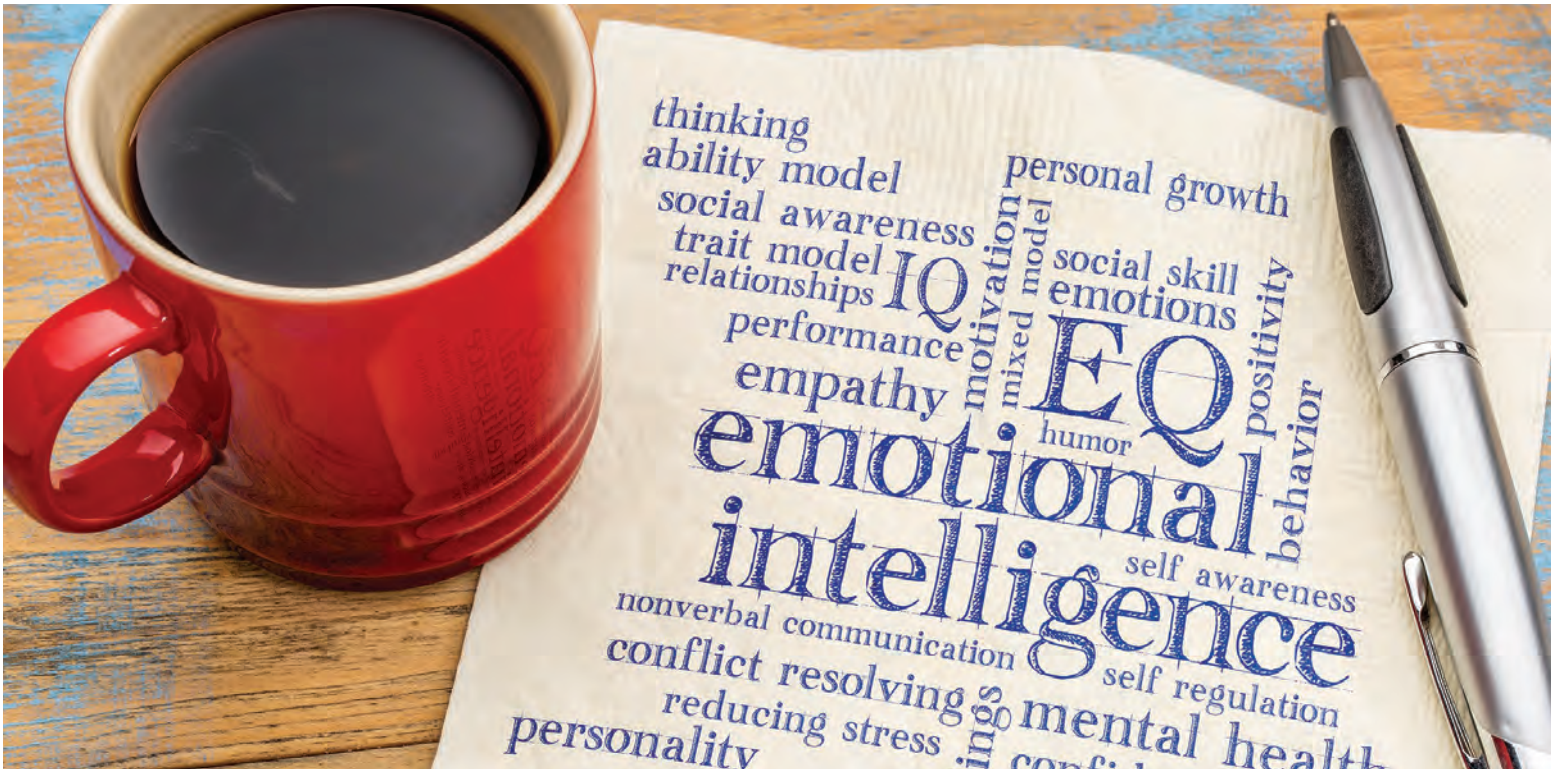
MENTAL HYGIENE

Finally, "code-switching" became an important part of the adjustment. We went from jackets and ties to polo shirts in our virtual meetings with leaders. Being with the family also took on a new meaning last year. For many, COVID-19 gave us a new appreciation for one another and for our families. We realized how much we need each other. At JPEO A&A, leaders took on initiatives to implement virtual get-togethers, monthly virtual town halls and value-added trainings and programs.

There is implicit sympathy we share with no words required. That sympathy needs to be nurtured to produce organizational and personal fruits. Michael L. and Katherine P. Stallard in their 2020 Government Executive article, "COVID-19 Is Coinciding With a Loneliness Epidemic," stressed that "collectively, we understand the goodness of 'flattening the curve.' Each of us must do our part to slow the spread of the virus and COVID-19, the disease it causes. But it is not the only epidemic we are facing right now. The requirement to separate ourselves from others comes at a time when America and many other nations are in the midst of an epidemic of loneliness whose antidote is greater positive social connection."

To combat this new sub-enemy, leaders such as JPEO A&A's Curran, the chief of staff, implemented monthly virtual meetings to give us the opportunity to interact, see each other, and boost social connection. This was significant because stressors such as social distancing increased vulnerability to other stressors, e.g., loneliness. By having these monthly town halls and communicating the current situation to the workforce, leaders boosted positive emotions and willpower. The long-term effects of such initiatives could possibly be responsible for an even more reduced depression rate.

A study published in The Lancet last March, "The psychological impact of quarantine and how to reduce it: rapid review of evidence," delivered evidence showing that quarantined individuals experienced irritability, insomnia, poor concentration, deteriorating work performance and reduced work concentration.



NEW APPRECIATION
Not all of COVID-19's impacts were negative. Teleworking from home gave us a new appreciation for one another and for our families, and a realization for how much we need each other. (Image by Getty Images)

The authors, Samantha K. Brooks, Ph.D., Rebecca K. Webster, Ph.D., Louise E. Smith, Ph.D., Lisa Woodland, Simon Wessely, Neil Greenberg and Gideon James Rubin, found that isolated individuals "reported sufficient symptoms to warrant a diagnosis of a trauma-related mental health disorder." Imagine if our leaders did not react the way they did.

Army leaders developed trainings to address feelings of isolation. Billy Hallmark, the Army substance abuse and suicide prevention programs manager at Detroit Arsenal, Michigan, said, "Training constantly needs to change to meet the needs of the current situation. … Due to the impact of COVID-19, racial tension, job loss, grief, isolation, political tension and the unpredictability of life increases stress and depression and need to be addressed."

Dr. Holly O'Reilly, a clinical psychologist at the Defense Health Agency, said that "sometimes a little bit of help is all we need to improve our mental health and be mission ready; taking small steps to address problems early on makes a big difference, especially during the pandemic." So, our leaders did exactly that—they took small steps to address potentially gigantic problems.

HOW DO WE KEEP THESE GAINS?

Critical to success was that leaders applied the "soft skills" to battle the "tough" enemy. Life as we know it suddenly stopped. All of those who could stay home or were forced to stay home still are home. In a matter of days, we were taken out of our busy lives and told to deal with the new normal. It would be intellectually implausible to think that this new reality hasn't taught us anything. Surely it must be giving all of us a new perspective and encouragement to reprioritize the hierarchy of importance.

So, what became really important? I think people did. Given the current environment and its impact on all operations, people remain the first priority. "Winning matters, and people are my No. 1 priority," said McConville, the Army chief of staff. "People are our Soldiers—regular

I believe that our leaders challenged everything about the situation we found ourselves in, but they did it in a way that pulled everyone together, not by force but by commitment.

Army, National Guard and Reserve—their families, civilians, and Soldiers for life—retirees and veterans. We win through our people, and people will drive success in our readiness, modernization and reform priorities. We must take care of our people."

Leadership matters. It is the people who keep the Army's strategic approach to modernization strong and priorities on track, but it takes leaders who lead to maintain a healthy and motivated workforce. We generated our strength at home and our self-worth at work. Leaders provided a sense of direction. Their soft skills continue to prove to be indispensable in challenging times. There is a clear correlation between leaders' emotional intelligence and the performance of their organization. These skills operate in both verbal and non-verbal areas responsible for emotional sensitivity and expressiveness.

HAVE WE CROSSED THE RUBICON AS A NATION?

COVID-related challenges required a lens that looks beyond what we understand, and focuses on factors that affected behaviors. Paul Sparrow and Carry Cooper, in their 2014 article, "Organizational effectiveness, people, and performance: new challenges, new research agendas," remind us that unlike in the 1950s, when organizations focused on a system model as a determinant of organizational effectiveness, modern organizations attribute this responsibility to leaders. This is because leadership matters. We look to leaders for guidance and example. We hope they can create that internal or external customer perception that makes all of us appear strong and ready to deliver regardless of the enemy we face. We know there is more to performance than the interplay among productivity, flexibility and profit. And to that extent, I was glad to see our leaders making effective consequential decisions quickly and under intense pressure, often with incomplete information.

The environment we have found ourselves in triggers both positive and negative emotions. Some of us might have even experienced cognitive dissonance while attempting to discern everything 2020 had to offer. We continue to search for our COVID-19 identity. As we filter through the news reports and other sources of information, we wonder how we fit in. It is likely that this question remains unanswered for many. The line between truth and lies is as cloudy as it was in March 2020. It seems that creative destruction is at its best with one small exception: COVID-19 went straight for destruction, putting creativity aside, but leaders fought to bring it back.

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NOTE: This article is based on the author's approved doctoral research. Her dissertation, "Leader emotional intelligence as a response to creative destruction and its effects on organizational effectiveness," closely reflects her people-centered leadership values. The author strongly believes that one cannot become an effective leader without having the desire to grow others. Therefore, the concept of emotional intelligence is, in her view, a critical element in effective leadership. Her extensive research delivers evidence that empathy and social skills are two indispensable facets of emotional intelligence required for building effective organizations.

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BEEN THERE, DONE THAT

WHO IS THE *CUSTOMER*?

For non-acquisition professionals, it's unfathomable that acquisition professionals find this difficult to answer.

by Robert F. Mortlock, Ph.D., Col., USA (Ret.)

Really, are you serious? Many might automatically jump to provide the easy and obvious answer: the warfighter. The warfighter is the *ultimate customer*, meaning the beneficiary, of most defense acquisition efforts.

This is not debatable; however, this answer is naive and too simplistic to be useful. It fails to appreciate the complexities of navigating big "A" acquisition, which is composed of the Adaptive Acquisition Framework, the resourcing system (planning, programming and budgeting and execution), and a requirements process—in most cases through the Joint Capabilities Integration and Development System.

This simple answer also fails to recognize the program manager's triple constraint of balancing a program's cost, schedule and performance baseline. Finally, it fails to acknowledge the complex acquisition environment consisting broadly of a set of key stakeholders including Congress, service leadership, industry partners, users and the acquisition program chain of command. (See sidebar, "Big 'A' Acquistion: A Primer," Page 139.)

The concept of "know your customer" or "understand your customer's requirements" is fundamental to the success of any service industry. Defense acquisition is basically a service industry with the mission of providing combat capability to the warfighter. Implied within this mission is that defense acquisition can define its customer. If acquisition programs can't define their customer more specifically than "the warfighter," then how could they efficiently and effectively succeed in their mission?

According to "The Defense Acquisition System," Department of Defense Directive 5000.01, the acquisition system provides "effective, affordable, and timely systems to the users" with the "primary objective of defense acquisition to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a



STRYKING OUT
Students in the Scout Leader Course at Fort Benning drive M1126 Stryker Combat Vehicles. Knowing your customer and understanding your customer's requirements are fundamental to the success of any service industry. (Photo by Patrick A. Albright, Maneuver Center of Excellence and Fort Benning Public Affairs)

timely manner, and at a fair and reasonable price." (Emphasis added.) The term "user" is synonymous with "warfighter" when referring to desired operational capabilities.

Embedded and implied in the purpose and objective of defense acquisition is the concept of delivering products and services of the desired *quality*. A fundamental principle of quality is an understanding that quality (and thereby value) is defined by the customer. For acquisition, the customer is the end user (that is, the warfighter) of the product or service, who also determines whether the product or services provide the required value.

IT DEPENDS AND IT'S COMPLICATED

In the 15th Annual Acquisition Research Symposium on May 9, 2018, Anne Rung, as the director of government sector for Amazon Business and as the former U.S. chief acquisition officer under President Barack Obama, presented her insights into the challenges facing federal acquisitions.

Rung highlighted that one key to success in acquisition, whether in the federal government or in a commercial industry, was first listening to the customer (getting early input and continuous feedback) and truly understanding the customer's requirements. Amazon obviously has mastered the art of delivering what the customer wants and providing value to its customers. During the question-and-answer part of the symposium, several questions centered around the differences between private sector and public sector acquisition, such as, "Who is the customer in defense acquisition?"

The collective group of hundreds of the most experienced acquisition professionals and researchers struggled to agree on a definition of the customer. Probably the most basic formula for success in commercial industry was somehow not universally understood by acquisition professionals. Why is this question difficult to answer for acquisition professionals? Because, of course, the answer is, "It depends, and it's complicated."

During the subsequent symposium proceedings, several senior defense acquisition leaders passionately attempted to clear up any misunderstanding by stating that defense acquisition knows that the warfighter is the customer. But is it that simple? Why the confusion?

THE USER PERSPECTIVE

I'm surprised by how many times the inability to answer this simple question for acquisition programs has led to a lack of unity of effort (one of the principles of war that also applies to acquisition management) and has resulted in a higher risk of acquisition failure. The first example comes from my own experience as I prepared for duties after being Department of the Army centrally-selected as the

product manager for the Infantry Carrier Vehicle, Medical Vehicle, and Field Recovery and Maintenance Vehicle in the Future Combat Systems (FCS) program office.

Before assuming the product-office charter, I attended the infantry pre-command course at Fort Benning, Georgia—home of the infantry. As the only acquisition officer in this course, I felt both humbled and honored to be attending the same course as the Army's future infantry battalion and brigade commanders. On the first day, we had a reception to meet the infantry school commandant and Fort Benning commanding general.

I could not have been prouder to represent the Army Acquisition Corps. Each officer in the course stated the command they were to assume, and I introduced myself as the next Infantry Carrier Vehicle product manager. The commandant very politely but matter-of-factly asked me why the vehicle didn't have a manned turret like the Bradley Fighting Vehicle it was replacing. He followed by stating that the vehicle commander's eyeballs were the best reconnaissance and surveillance systems and yet the Infantry Carrier Vehicle did not allow a mechanized infantryman to "pop a hatch" and scan the vehicle's surroundings.

Already feeling a bit intimidated and resisting the urge to defend the Army-approved requirements, I stumbled through a response and stated what great points the general had made.

But I understood right then that I was about to take the lead for the development, testing and production of one of the Army's highest priority acquisition programs, and Fort Benning (or at least its top officer) was not a proponent. I thought to myself that this would be an interesting three years. Wasn't Fort Benning the customer? Or was the general the customer? Or were the infantry battalion and brigade commanders the customers? Or was each mechanized infantryman the customer?

The Army assigned a U.S. Army Training and Doctrine Command capability manager to represent the user, lead the requirements-definition activities and serve as the liaison office between the users and the acquisition program office. The Army Requirements Oversight Committee (AROC) approved the requirements for the vehicle in a capabilities-development document. How could the Army not include the requirement for a manned turret if that was the top priority for Fort Benning's commander?

It's important to put the Infantry Carrier Vehicle acquisition effort in the proper context. The vehicle was part of a family of eight manned ground vehicles within the planned Future Combat Systems Brigade Combat Team construct for the Army Future Force. The FCS program entered the acquisition framework as an official program of record at Milestone B to begin engineering and manufacturing development efforts in 2003, with a planned Milestone C (low-rate initial production) in 2010.

The experience mentioned above occurred in 2007—four years into the engineering and manufacturing development phase and well past the point of questioning the basic requirements. A year later, the same Benning commandant test-drove a prototype of the Infantry Carrier Vehicle in the contractor test facility (parking lot). The FCS Program Office had hopes of turning him into a proponent. He was impressed with the design progress but became nauseated after a 10-minute test drive. For maximum force protection and survivability of the vehicle crew, the new vehicle's requirements called for it to be driven by computer screen from inside the vehicle. Despite high resolution cameras, some latency existed between what the driver's eyes saw on the computer screen and what the driver's body felt. Proper training of drivers can overcome this phenomenon. However, the program's attempt to create an advocate in the general failed. And again, I was left with the same question: Who's the customer?



INPUT, FEEDBACK FIRST

Whether in commercial industry or in the federal government, one key to success in acquisition is first getting early input and continuous feedback from the customer and truly understanding the customer's requirements. (Photo by Capt. Scott Kuhn, 3rd Armored Brigade Combat Team, 1st Cavalry Division)

MORE ADVENTURES IN DEVELOPMENT

The Army canceled the FCS program in 2009 and embarked on the Ground Combat Vehicle program to replace the Bradley. I was one of the first product managers for the Ground Combat Vehicle effort, specifically charged to work with the requirements community to ensure the requirements for the newly envisioned Bradley replacement were technically achievable and affordable. At the time, Fort Benning served as the home of the infantry, and Fort Knox, Kentucky, served as the home of armor. The resources that had supported the oversight and management of the development of a family of eight FCS manned ground vehicles were now applied to the development of the Ground Combat Vehicle. The Army designated Fort Knox as the lead in the defining its requirements. The program pushed for a materiel development decision and Milestone A in 2010 to begin awarding technical-maturation and risk-reduction contracts to industry. The same two industry partners that were teamed together in the FCS engineering, manufacturing and development phase for manned ground vehicles now competed against each other in a technical-maturation and risk-reduction phase for the Ground Combat Vehicle.

Again, not clearly defining the customer plagued a Bradley-replacement acquisition effort. The Army put the Armor School in charge of the Ground Combat Vehicle requirements. Based on the requirements, the program office, the interested industry competitors and engineers at the research, development and engineering center at the Tank and Automotive Command, all agreed that the Ground Combat Vehicle would weigh between 50 and 70 tons—nearing the weight of the 72-ton M1A2 Abrams tank and almost twice as heavy as the 30-ton Bradley or previously planned 30-ton Infantry Carrier Vehicle.



WHO IS THE CUSTOMER?
This simple answer—the warfighter—fails to recognize the program manager's balancing of a program's cost, schedule and performance, and fails to acknowledge the complex acquisition environment.

NEVERTHELESS, THE ARMY PERSISTED

The new vehicle had force protection, survivability and lethality requirements for a mechanized infantry vehicle written by non-infantrymen. In subsequent reviews with the Headquarters Department of the Army staff (including the vice chief of staff of the Army), the potential weight of the Ground Combat Vehicle and excessive requirements were highlighted. However, the Army pushed ahead and awarded two contracts based on schedule pressure and to protect the planned and programmed resources of the old FCS manned ground vehicle program.

Who was the customer of the materiel-development decision or Milestone A review for the Ground Combat Vehicle program? Four years later, the Army canceled the Ground Combat Vehicle program because the vehicle was going to be too big and heavy and had excessive requirements. The effort was not focused on the mechanized infantryman—it was focused on other Army priorities.

In recent years, after several failed attempts at initiating the Next Generation Combat Vehicle, the Army is trying again—this time calling the Bradley replacement the Optionally Manned Fighting Vehicle. I have doubts, however, that the Army has solved the problem of defining the customer.

Does a mechanized infantry vehicle really need to be operated remotely? What's the benefit of driving it remotely? What are the tactics, techniques and procedures to fire the main gun remotely, and when, on the battlefield, would that ever occur?

The vehicle crew is unprotected while outside the vehicle and firing the main gun. That's a very inefficient lethality system because the parts of the vehicle used to protect the crew and protect the troops being transported are unnecessary for that mission. So, in the end, the Optionally Manned Fighting Vehicle won't be an optimized troop transport carrier or an optimized lethality system.

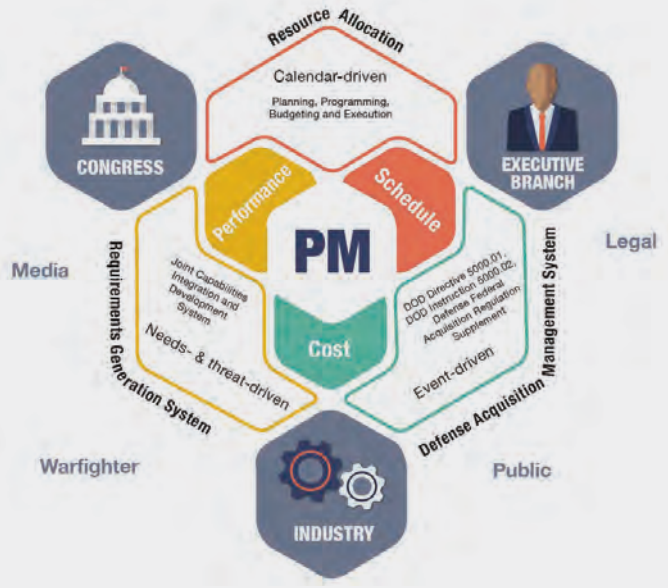
The collective group of hundreds of the most experienced acquisition professionals and researchers struggled to agree on a definition of the customer.

‘BIG A’ ACQUISITION: A PRIMER

Defense acquisition program managers (PMs) facilitate the development, testing, procurement and fielding of capabilities to warfighters. The PM is at the center of big “A” acquisition, whose purpose is to deliver warfighter capability. The PM is responsible for cost, schedule and performance (commonly referred to as the “triple constraint”) of assigned projects—usually combat warfighting systems.

The PM has a formal chain of command (or authority) through DOD in the executive branch of federal government. The PM reports directly to a program executive officer, who reports to the component acquisition executive (an assistant secretary for that service—either Army, Navy or Air Force—and who reports to the defense acquisition executive (the undersecretary of defense for acquisition and sustainment). Depending on the program’s visibility, importance and funding levels, a program milestone decision authority is assigned to the appropriate level of the chain of command.

Programs within defense acquisition require resources (primarily funding) and contracts (for execution of work) with industry. Congress provides the resources for the defense programs through the annual enactment of the defense authorization and appropriation acts, which become law and statutory requirements. The PM, through warranted contracting officers, enters contracts with private companies within the defense industry. Other important stakeholders include actual warfighters, the American public, the media, as well as fiscal and regulatory lawyers.



BIG “A” ACQUISITION
The DOD 5000-series regulations spell out layers of bureaucracy and oversight for the Defense Acquisition Management System. (Graphic courtesy of the author)

As a backdrop to this complex acquisition environment for PMs, there are three decision support templates to guide programs:

- One for the generation of requirements, known as the Joint Capability Integration and Development System for formal requirements.
- A second for the management of program milestones and knowledge points, generally referred to as the Defense Acquisition Management System (or recently renamed as the Adaptive Acquisition Framework).
- A third for the allocation of resources, known as the planning, programming, budgeting and execution system.

Each of these decision support systems is fundamentally driven by different and often contradictory goals:

- The requirements generation system is driven primarily by a combination of capability needs and an evolving threat—pointing toward the need for 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 the Congress and transparency to the American 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 off-ramps supported by the design, development and testing of the systems as technology, system design and manufacturing processes mature.

—ROBERT F. MORTLOCK



VEHICLES OF THE FUTURE

A Mission Enabling Technologies Demonstrator, rear, and two Robotic Combat Vehicles maneuver through a Fort Carson, Colorado, training area in early July at the control of Soldiers from 4th Infantry Division. But before such vehicles can be utilized, basic questions need to be answered. Why does a mechanized infantry vehicle need to be operated remotely? Under what conditions would the main gun be fired remotely, and when, on the battlefield, would that ever occur? (Photo courtesy of Ground Vehicle System Center)

Is this what the customer wants to replace the Bradley, or is the Army more interested on riding the autonomous vehicle hype? Is the customer defined? Is the customer defining the Optionally Manned Fighting Vehicle value and quality? Or does the Army have other priorities, like proving the value of the newly established Army Futures Command or the high-profile, newly established Next Generation Combat Vehicle Cross-Functional Team?

The leaders and professionals in these offices are extremely dedicated to the mission, intellectually capable and technologically savvy. However, they are working on an effort that has struggled in the past to properly define its customer—jeopardizing their hard work and the potential success of the effort.

CONCLUSION

Recent acquisition reform initiatives have incrementally improved defense acquisition. Examples include the empowering of the services for their own acquisition programs, the adoption of the Adaptive Acquisition Framework and the emphasis on the use of other-transaction authorities when appropriate. However, until defense acquisition addresses the challenge of properly defining the customer for acquisition efforts, obtaining the desired acquisition outcomes may be challenging.

Putting in the effort upfront and early to specifically define the customer and determine who best represents the customer will pay dividends in getting improved capability to the warfighter. Leadership, open lines of communication, collaboration between subject matter experts and transparency with stakeholders will provide the unity of effort and establish the trust needed for the acquisition efforts to be successful at delivering improved warfighting capability at the speed demanded by rapidly changing threats while capitalizing on technological advances.

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FIVE STEPS TO SERENITY

How Army sustainment can lead the integration of artificial intelligence for the Army and DOD.

by Maj. Nathan Platz and Maj. Andrew Horn

Imagine a world where commanders make decisions with the aid of predictive models informed by real-time data. Where staffs no longer aggregate outdated data and build PowerPoint slides, but focus instead on assessing information and optimizing processes to reduce waste. This is the potential and more for artificial intelligence within the Army and DOD. We believe that the Army sustainment enterprise is postured to lead the integration of artificial intelligence (AI) within the Army and DOD because of a large volume of data available through Global Combat Support System-Army (GCSS-Army). The Army and DOD have recently prioritized implementing AI into the military operations; however, a 2019 RAND Corp. study, "The Department of Defense Posture for Artificial Intelligence," highlights existing challenges in "organization, advancement, adaption, data and talent."

That study outlines five areas for change within DOD to fully harness AI as a tool for providing predictive analysis for commanders to improve decision-making. AI is a general term for a program that learns a process from existing data and makes a prediction about a future state. The wealth of data in GCSS-Army is the perfect environment for Army sustainment to lead DOD in adopting AI tools for application into military operations.

STEP I: DATA

Become diligent about data collection and begin training AI tools against currently available data.

> As summarized in the book "Prediction Machines," by Ajay Agrawal, Joshua Gans and Avi Goldfarb, AI is "prediction technology" where prediction is the process of filling in missing information—prediction takes information you have, often called "data," and uses it to generate information you do not have.

The first step to integrating AI in the Army is to apply AI toward current data sets. Data is the key—the best algorithm will fail if the data is inconsistent or sparse. RAND found that the advances in AI "are predicated on the availability of large, labeled data sets and significant computing power to train the algorithms." The Army sustainment enterprise is ahead in DOD's and the Army's integration of AI because of data available in GCSS-Army, which, according to Northrop Grumman, is the largest enterprise resource planning system ever successfully attempted within DOD. As a result, the Army has large, labeled data sets in GCSS-Army for maintenance, materiel management and supply.

The Army needs to develop algorithms to train against this data and apply AI to provide predictions on future maintenance and supply status from the tactical to the strategic level. The Army needs to begin training the algorithms to provide predictive analysis to commanders now. The benefit of this is to enable commanders to assess the usefulness of these predictions and forecasts in making decisions, further improving the application of AI. This offers a source of data for training, verification and testing to hone algorithms and to produce models of predicted future outcomes. The Army could use the National Training Center at Fort Irwin, California, and the Joint Readiness Training Center at Fort Polk, Louisiana, as initial hubs for training and validating algorithms on the existing data. Personnel would see the real-time status of logistics assets and commanders could make decisions informed by predictive analysis from that data. As data is collected and decisions made from that data, the algorithms would become more accurate and the predictions more precise. The number of Army units that rotate through these centers, the controlled environment and sophisticated data collection tools already in existence make these prime environments for testing early AI integration on existing data.

STEP 2: COLLECTION

Improve and expand data collection efforts to integrate the tracking of ammunition, fuel and transportation.

While the data in GCSS-Army establishes a great base for applying AI tools, the Army requires improvements and expansion to data fed into that database. The Army is leaning forward in this endeavor through expanding GCSS-Army. In a 2017 article in Army Sustainment magazine, "GCSS-Army: Providing big data for readiness," the commander of the Combined Arms Support Command, Maj. Gen. Rodney D. Fogg, discussed a future addition to



DATA PAVES THE WAY
Data is the key to integrating AI into the Army—the best algorithm will fail if the data is incomplete in any way. (Image by Getty Images/SolStock)



COLLECTION IS CRUCIAL
Currently, data isn't collected at every opportunity—that hinders AI integration and is a hurdle the Army needs to clear. (Image by Getty Images/Laurence Dutton)

GCSS-Army that would include the ability to track ammunition, fuel and transportation. Providing the visibility offered for maintenance and supply in GCSS-Army to other areas of logistics is essential. This demonstrates that the Army sustainment enterprise has a foundation on which to build AI platforms.

The Army must integrate this capability and the data collection efforts now. While it is largely agreed upon that the implementation of GCSS-Army was successful, the transformation took 10 years: six years of operational assessment at Fort Irwin from 2007 to 2013, and four years for phase I and phase II integration from 2013 to 2017. A similar timeline is likely to integrate data collection for transportation, fuel and ammunition. Establishing a consistent data set and the data collection process for these areas of logistics is crucial. RAND found that a hindrance to AI integration is that data is not collected and stored at every opportunity. This is currently true for transportation, ammunition, fuel and water—this is the hurdle the Army must clear to integrate tracking of commodities in GCSS-Army and to apply AI to inform commanders across all facets of logistics. Once the Army is able to consistently collect data from all areas of logistics and integrate that data into GCSS-Army, the Army can apply AI tools against the complete logistics dataset and offer timely predictive analysis to commanders at echelon.

STEP 3: STANDARDIZED FORMAT

Standardize the logistics common operating format at echelon and have it fed by cloud-based data.

Logistics commanders, from the tactical to the enterprise, track metrics on a logistics common operating picture to inform decisions and help see the enemy and themselves. The formats for these logistics common operating pictures are not in fact, common, but are all unique to each unit despite displaying the same information. The lack of standardized format forces staffs to spend hours formatting PowerPoint and Excel documents to track latent data. The Army has a great tool in the Army Readiness – Common Operating Picture with potential to advance the integration of informing decisions utilizing AI. Army Readiness – Common Operating Picture displays information from GCSS-Army logically to allow leaders to "see themselves." While Army Readiness – Common Operating Picture is a great visual tool, it only displays historical data for maintenance and supply without providing useful predictive analysis and it is not useful at the tactical level.

As described by Fogg in his 2019 article "Building the Army Readiness – Common Operating Picture," Army Readiness – Common Operating Picture needs to provide commanders with analytics. We think those analytics must be fully informed by AI and useful at echelon. To do so, we need to incorporate the expansion data from additional logistics commodities in GCSS-Army and apply AI against the data for predictive analysis in Army Readiness – Common Operating Picture to inform decisions. This will enable commanders to have timely predictions and forecasts rooted in data, and staffs will have the ability to focus on the future state rather than working to confirm the current state.

STEP 4: EXPAND TRAINING

Expand training for enterprise resource platforms and data analysis at all levels of professional military education.

In a recent meeting on the future application of data within United States Special Operations Command, Chief Data Officer Thomas Kenny briefed that the Defense Logistics Agency saved 130,000 man-hours last year by automating all displays. This removed the requirement for briefing on PowerPoint and freed staff to conduct analysis.

Key to successfully integrating AI is establishing a training environment and training tools similar to Anaconda (an open-source programing environment) and Jupyter Notebook (open-source software for interactive computing) platforms for the Python programming language. The Army sustainment enterprise can expand on the existing GCSS-Army virtual training environment to enable Soldiers to apply AI development tools against data in GCSS-Army and share code.

This would allow a scalable and tailorable training platform to apply AI tools to existing data. Existing GCSS-Army business intelligence training platforms and tools should be elevated beyond their current optional state of learning to include AI applications once integrated in the GCSS-Army and Army Readiness – Common Operating Picture environments. Along with the training environment, the Army must establish training standards for data as it improves data collection efforts.

In addition to training, the Army must leverage civilian expertise through direct hires and expanding existing partnerships with leaders in the AI space—Microsoft, Amazon, etc. The Army should not overlook the warrant officer ranks in its development of AI expertise. Warrant officers already lead efforts in understanding GCSS-Army application and should do the same leading the integration of AI.

The wealth of data in GCSS-Army is the perfect environment for Army sustainment to lead DOD in adopting AI tools for application into military operations.

STEP 5: THE ACQUISITION PROCESS

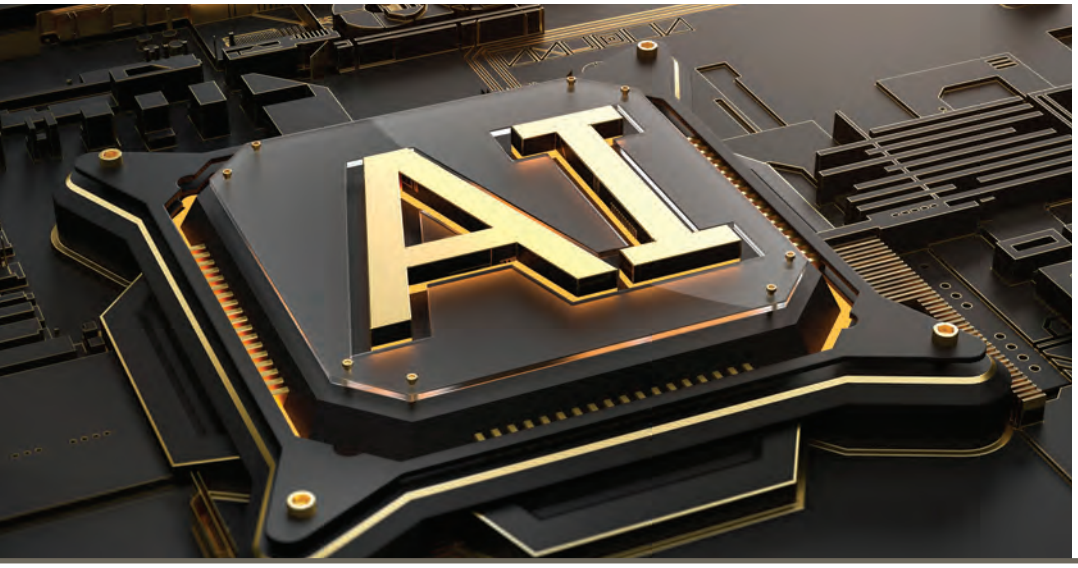
Leverage the acquisition process to enhance data collection capability and improve AI integration.

The final area of consideration is the American industrial base and our acquisition process. Leveraging the acquisition process is an advantage available to the entire Army and DOD. The Army must leverage its power in procurement for the cultivation of data and future integration of AI. As we previously described, we lack consistent data collection devices for fuel, water, transportation and ammunition—yet these devices exist in the commercial sector. On the commercial side, we can use an app on our phone to monitor the fuel level in our personal vehicle or track a package as it moves from an Amazon warehouse to our house. The Army sustainment enterprise needs to use the acquisition process and relationships with suppliers to demand similar data-collection capabilities in all products, and, most importantly, require access to data on all equipment from defense contractors.

The Army needs to apply the government-contracting process to prioritize manufacturers and developers who embrace AI and incentivize those without AI to adopt data collection capabilities that support the Army and DOD integration of AI. The Army must focus its attention as much on software as it does on hardware in order to keep pace with advancing technology.

NEXT STEPS

Through initiatives underway to expand data fed into GCSS-Army and the maturation of the Army Readiness – Common Operating Picture, the Army sustainment enterprise has established the initial



GREAT POTENTIAL

AI has the potential to give commanders predictive models informed by real-time data and would allow Soldiers to assess current information and reduce waste. (Image by Getty Images/Viaframe)



GET ON THE AI TRAIN

Appropriate training environments and tools are essential to successfully integrating AI. The GCSS-Army virtual training environment could be a tailorable platform used to train Soldiers to apply AI tools and existing data. (Photo by Master Sgt. Becky Vanshur, 124th Fighter Wing)

framework for the development and integration of AI. This framework is in line with DOD goals to provide "AI-enabled information, tools and systems to empower, not replace, those who serve." Applying an AI framework to existing data to provide predictive analysis for commanders through Army Readiness – Common Operating Picture, improving AI training nested with GCSS-Army and leveraging the industrial base to assist with data collection and AI integration are the next steps. These steps are steep and the path is littered with obstacles, but the Army sustainment enterprise is primed to lead the change in AI for the Army and DOD. These steps are only the first of many required for us to realize that imagined world.

"Advances in AI have the potential to change the character of warfare for generations to come. Whichever nation harnesses AI first will have a decisive advantage on the battlefield for many, many years. We have to get there first."

—FORMER SECRETARY OF DEFENSE MARK T. ESPER.

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KEEPING UP
Sgt. Maj. of the Army Michael A. Grinston, center, remotely drives a pre-prototype Robotic Combat Vehicle from inside a Mission Enabling Technologies Demonstrator at Fort Carson, Colorado, in August. Soldiers provided feedback on the early combat vehicle platforms. If Army contracting is to keep pace with this process, its culture will have to change to play a more effective role, critics have said. (Photo by Sgt. Liane Hatch, 3/4 ID)



CULTURE CHANGE: MEASURING ARMY CONTRACTING

The push to seek output-driven metrics by which to evaluate the Army's contracting workforce will not end. It's time to think hard about what these measurements tell us.

by Maj. Brian J. Burton

The need to improve how we evaluate the Army's contracting work and how we use that data is well documented; for example, the U.S. Government Accountability Office (GAO) issued a report in June 2017 titled "Army Contracting: Leadership Lacks Information Needed to Evaluate and Improve Operations."

The problems aren't the Army's alone. In 2019, the Section 809 Panel—formally the Advisory Panel on Streamlining and Codifying Acquisition Regulations, established by Congress in the National Defense Authorization Act for fiscal year 2016—recommended to "use existing defense business system open-data requirements to improve strategic decision making on acquisition and workforce issues." The panel, composed of recognized experts in acquisition and procurement policy across the public (uniformed and civilian) and private sectors, added that "DOD lacks the expertise to effectively use [enterprise-wide acquisition and financial data] for strategic planning and to improve decision making."

The overall lead time for defense acquisition is too long to keep up with great-power competitors and non-state actors. The Section 809 Panel, which completed its mission in July 2019 having published a three-volume final report over the previous 18 months, stressed this repeatedly. The panel recommended a "war footing" approach whereby "rapidly and effectively acquiring warfighting capability and delivering it to service members takes precedence over achieving other public policy objectives."

For the contracting workforce, this means a focus on the pre-award phase of contracting. The Section 809 Panel recommends that we provide "products, and services at a speed that is closer to real time than the current acquisition process allows." At the same time, the Army is implementing new enterprise-resource planning software, in part to produce better data about what occurs during the contracting process. Our leaders want to know: "What does success in contracting look like?" and "How can we ensure we're allocating resources to the right things?" These are old questions asked with new urgency.

It's neither possible nor desirable to attempt to reduce the entirety of the contracting workload to something that one can determine upfront in terms of labor-hours.

CURRENT METRICS AREN'T GREAT

Measuring contracting tasks by requisite labor hours could be a good solution for some of the routine actions needed in contracting. For example, selecting clauses for an upcoming requirement should take a certain amount of time, which should be easy to determine, based on the size and type of anticipated contract actions. Other examples include reviewing invoices, awarding commercial contracts below the simplified acquisition threshold, exercising existing options, incremental funding modifications and data input. Data input typically includes the use of enterprise resource planners for contract award and management; and other, more specialized systems such as the Synchronized Predeployment and Operational Tracker, Trusted Associate Sponsorship System and Joint Contingency Contracting System.

Army contracting leadership currently tracks a subset of these routine contracting tasks for compliance on a go or no-go basis (i.e., whether the task has been completed for applicable contracts). These tasks include completing evaluations of contractor performance, contract close-outs, funding de-obligations, appointing a contracting officer representative and completing contract action reports.

The problem is that we struggle with even these compliance (go or no-go) metrics. These should be easy to collect, but we still get bogged down frequently with new or updated enterprise resource planners and determining who owns what actions. We're a long way from a usable labor-hour model.

In addition, with the exception of completing contractor evaluations and ensuring oversight by contracting officer representatives, which of these compliance metrics currently measures something the Army should be prioritizing?

There are many other important processes we *could* be measuring (i.e., "quality metrics"). We could measure industry input on requirements. We could build a proposal difficulty score that rates how hard it is for vendors to participate in federal contracts, reflecting proposal sizes and evaluation sub-factors. It should be easy, with commercially available software, to score the readability and comprehensibility of requirements documents. We could measure how many of the best-value trade-off source selections (whereby we can exchange higher prices for improved performance) end up awarded to the



HIGH-STAKES CHOICES
Army Chief of Staff Gen. James C. McConville receives a brief before a V-280 Valor flight demonstration in Arlington, Texas, on Oct. 28. The need to improve how the Army evaluates its contracting work and uses that data is an issue that has come to the forefront with the importance of the Army's modernization strategy. (Photo by Luke J. Allen, Army Futures Command)

lowest bidder (possibly out of fear of protest). How often are the new 2019 National Defense Authorization Act acquisition authorities being used? These are just potential *pre-award* areas to measure. There are many others.

On a related note, one measure the Army currently uses to determine the size of the contracting workforce is how many dollars an organization puts on contract and how many contract actions they execute. This method not only fails to track the labor-hours type tasks, such as time spent inputting data into the Synchronized Predeployment and Operational Tracker, Trusted Associate Sponsorship System and Joint Contingency Contracting System —a measure independent of "dollars and actions"— it also could create an incentive for individual contracting employees and organizations to prioritize the number of contracts they award over the number of high-quality contracts they award (i.e., quantity over quality). We cannot analyze whether, or to what extent, there is an exchange of contract quantity for contract quality unless we develop and evaluate the quality metrics.

METRICS NEVER TELL THE WHOLE STORY

A true culture change in Army contracting would require us to acknowledge what can be measured or streamlined and what cannot. A prime example: The work of a contracting officer (KO)



TEST AND TEST AGAIN

Soldiers from the 82nd Airborne Division use the latest prototype of the Integrated Visual Augmentation System (IVAS) during a trench-clearing exercise in October at Fort Pickett, Virginia. A true culture change in Army contracting would require an acknowledgement of what can be measured or streamlined and what cannot. (Photo by Bridgett Siter, Army Futures Command)

is to provide expert services, but expert services are notoriously difficult to quantify. A recent article in the Journal of Behavioral and Experimental Finance defines a market for expert services or "credence goods" as one where there is "asymmetric information between the expert seller and his customer regarding the fit between the characteristic of the product and the needs of the customer" (e.g., experts such as auto mechanics, surgeons and attorneys). That article, "Credence Goods in the Literature," provides this definition and outlines the two fundamental problems in markets for credence goods, i.e., that the expert could fail to provide sufficient effort or provide more effort and time than needed without the customer's knowledge.

The way to monitor and improve KO performance is analogous to how one would evaluate other experts. KOs determine the content quality of contracts and the process for source selection, lead negotiations and draft decision documents on claims that are quasi-judicial and require independent KO judgment. Each scenario is as novel as the requirements, and what's best or fastest isn't ascertainable using any existing decision tree. It is hard to tell, both during and after contract formation, whether the KO did a good job. However, a KO's poor performance may manifest in very consequential ways in terms of dollars and performance.

It is hard for non-experts to tell whether a KO exerted the right amount of effort, in the same ways that it is hard to tell whether an attorney billed too many hours. Rating a contract based on complexity beforehand will not provide someone an easy answer for how much effort is required, because the factors that create that complexity are often unique. It's neither possible nor desirable to attempt to reduce the entirety of the contracting workload to something that one can determine upfront in terms of labor hours.

Finally, the right effort—and right amount of it—should be up to other experienced KOs to analyze. Commissioned officers who serve in this role should concern themselves primarily with becoming experts who can perform and critique these aspects of contracting, to ensure that the workforce remains focused on the Soldier and capability overmatch.

OBSERVATIONS ON THE WORKFORCE AND IMPROVING OUTCOMES

1. Implementing new systems will stymie the workforce in the short term. Atul Gawande, a surgeon and public-health researcher, wrote a 2018 article for The New Yorker titled "Why Doctors Hate Their Computers," in which he described the "revenge of the ancillaries." The struggle is the result of the system design choices being more political than technical: Those doing medical billing have different concerns than doctors do, but the recommendations of the administrators become part of the software the doctors must use (to their irritation).

This is a useful analogy for the burden of new enterprise resource planning software on the workforce. We should better forecast updates of the software and enable the average worker to provide suggestions on improving systems. A solution might be to form a single U.S. Army Contracting Command office that seeks input when creating Army systems and consolidates Army workforce input for other DOD systems.

We could build a proposal difficulty score that rates how hard it is for vendors to participate in federal contracts, reflecting proposal sizes and evaluation sub-factors.

2. The Army contracting community should consider identifying members of the workforce who focus primarily on the repetitive "labor-hour" type tasks associated with contracting, possibly designating them as purchasing agents or procurement technicians. That way, if those numbers go down, the Army should either assign more technicians or provide more training. This could help alleviate the tension between the dual demands for contracting speed and more data input.

3. Leaders should distinguish tasks as either routine or requiring expertise. The Financial Times in 2019 ran the article "Law Firms' Love Affair With the Billable Hour Is Fading," in which they rated different firms on their ability to get away from the billable-hour model to other methods of pricing (i.e., quantifying) the expert services they provide. The winner? The Financial Times found that Accenture's legal department was able to cut its costs by 70 percent by creating two workflows: the "complex" contract workflow, handled by senior attorneys, and the "transaction" workflow handled by offshore junior attorneys using automation. While government employees can't be "offshored," we should realize that we have some expensive, highly trained employees doing some very repetitive tasks. That's not acquisition on a war footing.

4. All discussion about the workforce is ultimately about resources. The dollars-and-actions method of allocating resources has serious flaws. It measures the wrong things, fails to measure the right things and doesn't account for novel situations requiring expertise.

THE SO-WHAT

Increasing performance metrics in contracting is a worthwhile goal, but the application of expert abstract knowledge to diagnose and resolve novel problems is inherently difficult to measure. To change the culture of Army contracting, we should improve the metrics we have, reduce our deference to the flawed ones and facilitate data gathering. Ultimately, however, expertise is what will truly improve outcomes.

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SEISMIC CHANGES



Back-to-Basics puts defense acquisition workforce in a whole new world.

The Defense Acquisition Workforce Improvement Act of 1990 paved the way for our current acquisition workforce framework. That framework served us well for 30 years. But as the defense workforce is faced with rapidly evolving technology, near-peer threats and diminishing resources, a readjustment is required.

Dramatic, necessary changes are coming.

On Sept. 2, the Honorable Ellen M. Lord, undersecretary of defense for acquisition and sustainment (USD (A&S)), released a memorandum outlining Back-to-Basics (BTB), the first major reform of the defense acquisition workforce management framework since the Defense Acquisition Workforce Improvement Act (DAWIA) was enacted in November 1990.

The point of this change in policy is to focus the acquisition workforce on the core functions that do the design, development and fielding of operational capabilities to our warfighters. We started Oct. 1 with the beginning of this transition phase, with the goal of full implementation by October 2021.

Moreover, there are budget realities that require workforce training and development to focus on a leaner, basic approach that empowers the workforce for success. We can no longer afford for everyone to get a "one size fits all" acquisition education.

WHAT

To enable the workforce to focus on the design, development and fielding of operational capabilities, BTB consolidates our traditional 14 career fields into six:

- Business financial management and cost estimating.
- Contracting.
- Engineering and Technical Management.
- Logistics.
- Program management.
- Test and evaluation.

As we prioritized our efforts, we needed to look at which career areas are going to give us—for the Army and for DOD writ large—the best posture to be competitive against near-peer adversaries. And that may mean the removal of some current career fields as part of the coded acquisition workforce. That doesn't mean that what you do is not important. It just means that in a redefined acquisition workforce, we need to reprioritize training and development resources.

WHY

Why is this happening? Let's look at the 30-year-old acquisition framework established under DAWIA. The three-level training and education for certification tended to come early in a career and was a one-size-fits-all construct for anyone in a certain career field. It included excessive requirements and lacked flexibility to respond to demands in a changing and complex environment. Under BTB, there will be streamlined certification requirements that will include lean acquisition core training early in a career, followed by job-relevant training and on-the-job experience. The idea is to create a 21st-century continuous-learning environment where training happens closer to the point of need—right-in-time training.

As this new policy and its implementation evolve, updates will be announced on the Office of the USD(A&S) Human Capital Initiatives' Back-to-Basics Defense Acquisition Workforce Transformation website.



SHAKING THINGS UP

The Hon. Ellen M. Lord released a memorandum on Sept. 2 that outlines BTB, the first major reform of the defense acquisition workforce management framework since 1990. (DOD photo by Staff Sgt. Nicole Mejia)

There are also budget realities that need to be taken into account. Defense Acquisition University (DAU) simply can't continue to teach at this level. Under Defense Wide Review 1.0 and 2.0, DOD significantly reduced funding to DAU and the Defense Acquisition Workforce Development Account. BTB requires innovation to equip the workforce with the training and knowledge it needs in a more resourceful and effective manner

For instance, a Level III certification in contracting currently requires 650 hours of training. Senior contracting leaders are planning to reduce the higher level of contracting certification to 250 hours, which will free up contracting professionals for job-relevant and on-the-job training.

HOW

The education and training offered by DAU will change. In November, Alan Shaffer, deputy undersecretary of defense for acquisition and sustainment, and Jim Woolsey, DAU's president, wrote about how DAU will be transforming from "a schoolhouse to a highly networked platform, using many different modes and methods to provide information, tools, and training from numerous sources." DAU plans to have its training be

higher quality, more engaging, tailored more to the user's needs, and with a bigger focus on online learning and, of course, shorter classes. Read the complete message at https://www.dau.edu/News/Defense-Acquisition-Workforce-Reform-and-DAU's-Transformation.

BTB will place even greater emphasis on the supervisor-employee relationship. Training will no longer be as simple as checking a couple of boxes each year. With less prescriptive training required for certification, it will be incumbent upon the workforce member to seek out specialty training. Acquisition training and development will include increased point-of-need, often virtual, job-relevant training and credentials as part of its 21st-century continuous learning environment. To meet the needs of supervisors, the Army DACM Office has created a portal to provide supervisors with the latest information on how to best support their employees. Explore Supervisor's Corner at https://asc.army.mil/web/career-development/supervisors-corner/.

CONCLUSION

We know that these changes are daunting and, for many, may be unsettling. Be assured that we understand. I know you have many questions, questions that right now may not have answers. As this new policy and its implementation evolve, updates will be announced on the Office of the USD(A&S) Human Capital Initiatives' Back-to-Basics Defense Acquisition Workforce Transformation website, at https://www.hci.mil/btb.html. Our DACM Office has a webpage dedicated to BTB as well, at https://asc.army.mil/web/dacm-office/back-to-basics/. The DACM Office page also has answers to frequently asked questions, at https://asc.army.mil/web/topics/btb/. As soon as any new changes are finalized, we will let you know.



IN THE DRIVER'S SEAT

With the new Back-to-Basics reforms, acquisition workforce members will play a more active role in planning their own career training, in close coordination with their supervisors. (Image by Getty Images)

It's the people who do the work. If we're not focusing on the people and the talent they bring to the table, and what we can do to give them the tools to be really successful and good at what they do, then we're sort of missing the boat. I know this is a lot of change over a relatively short time. But the Army Acquisition Workforce faced the sudden challenges brought on by the COVID-19 pandemic and didn't miss a beat. I expect the AAW's shift to BTB will be just as seamless.

The point of this change in policy is to focus the acquisition workforce on the core functions that do the design, development and fielding of operational capabilities to our warfighters.

CAREER NAVIGATOR

LEAD-*ING* CHANGE

The new LEAD program is dedicated to training future program managers.

The Army does a lot of training, and that includes getting Army civilians ready for leadership positions. That's where the Director of Army Acquisition Career Management (DACM) Office comes in, when it launches the new LEAD program this summer.

Short for Leadership Excellence and Acquisition Development, LEAD represents the evolution of the DACM Office's Competitive Development Group/Army Acquisition Fellowship (CDG/AAF), which has been preparing Army civilians for more responsibility since 1997. The CDG/AAF offered expanded training through a series of education, leader development and broadening assignments for its fellows. So far, 245 fellows have graduated from the program, with 121 remaining active as Army Acquisition Workforce professionals.

However, change must come to all things, and the CDG/AAF program is no exception. In the summer of 2021, the redesigned program relaunches with the central goal of helping prepare high-potential GS-12s and GS-13s for program manager roles.



A FRESH NEW LOOK
The DACM Office is unveiling its rebranded Leadership Excellence and Acquisition Development (LEAD) program, which replaces the former Competitive Development Group/Army Acquisition Fellowship (CDG/AAF). (Image by U.S. Army Acquisition Support Center)

Kelly Terry, LEAD program manager, is spearheading the redesign effort. She has been employed with the United States Army Acquisition Support Center since about 1996—as one of the first acquisition career managers with the organization. She inherited the CDG/AAF program in the fall of 2018 and will be ushering her last cohort from CDG/AAF through graduation this May. "Then we will be all new, brand new, with just LEAD," she said.

WHY CHANGE

LEAD is a 24-to-30-month program offering expanded training through a series of education, leader-development and broadening assignments to build skills required for positions of greater responsibility. Fellows receive centrally funded leadership training and developmental assignments within the acquisition community—while that hasn't changed from the CDG/AAF years, the way the training and developmental assignments will be executed has been modified.

The driving change behind the redesign of the program was twofold, Terry explained. The first was advice from the fellows themselves. "The cohorts wanted to enable a true cohort experience during their tenure, with standardization on training and rotational assignments, when feasible," she said.

That didn't happen with CDG/AAF. Fellows were required to negotiate their own developmental assignments, and they varied in length—some were six months, others 18 months—and they had to fit those assignments around required program training, as well as a mandatory six-month assignment in Washington, she said.

"Now, the fellows negotiate and start a nine-month assignment at their home station, and then in March of the following year, they will all—at one time—go down to the Pentagon and work there for six months, with primary focus on a rotation as a Department of the Army systems coordinator (DASC). And they are all going to have a DASC assignment," Terry said. "After the D.C. rotation, LEAD participants will report back to the home station for another nine-month detail," she said. DASCs report to the Deputy for Acquisition and Systems Management, and they work in high-visibility, fast-paced assignments that provide critical capabilities to the warfighter, she explained.

Training requirements were also streamlined under the new program design, via enhanced eligibility criteria. Applicants are, at this writing, required to be certified at Level II in program management and Level III in their primary career field, Terry said. Applicants also will be required to complete the Civilian Education System – Advanced Course distance-learning module before program commencement.

The second driver of change was the intentional "back to basics" design, Terry explained. Since there is currently no dedicated career program for acquisition program managers, the DACM Office wanted to invest in training potential program managers to ensure "that we have the best at the top," she said.

WHAT'S NEW

Some other changes to the program include a decreased length, allowing the application of the new skills and knowledge quickly; enhanced senior leadership involvement, so that big Army issues are addressed during the program tenure and the addition of a new writing assignment, Terry said. The program uses a virtual board and relative slating list (RSL). "We host a virtual board, who will review all the applications and develop an RSL," she said. "The resulting RSL is then presented to the Army DACM Talent Management BOD [board of directors]. This is the first time we are engaging the TM BOD." This enhanced process



IN THE ROTATION
Under the redesigned LEAD program, the entire cohort of fellows will complete a concurrent six-month rotation at the Pentagon, working as Department of the Army systems coordinators. (Photo by Getty Images, iStock)

ensures that Army leadership is not only apprised of the program, but enabled to use the participants to their full potential, Terry explained.

"The Army DACM Talent Management BOD is composed of flag officers [general officers] and [Senior Executive Service members] from the acquisition community," she said. The BOD will meet in January; afterward, Terry will present the candidates to the Army DACM himself, Craig Spisak, who will make the final decision on which applicants are accepted into the program. Results will be disseminated in February and participants activated shortly thereafter.

CONCLUSION

Terry was especially excited about the mentorship aspect of the LEAD program. "Before, participants were required to identify their own mentors while in the program. We are complementing that process this year by engaging prior program graduates for mentorship," she said.

The mentorship aspect of the LEAD program will allow for more effective networking and greater promotion potential for graduates, Terry said. It also helps solidify LEAD as the premier program manager development program for the acquisition workforce.

Those interested in applying for the LEAD program will need to gather their Acquisition Career Record Brief, Senior Rater Potential Evaluation, command endorsement and organizational right-to-return forms, a statement of interest, and a resume. Follow the application instructions at: https//asc.army.mil/web/career-development/programs/lead/#apply.

—JACQUELINE M. HAMES



ANISAH ZEGHIR

COMMAND/ORGANIZATION: Program Executive Office for Combat Support and Combat Service Support

TITLE: Director of business management

YEARS OF SERVICE IN WORKFORCE: 15 years

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

EDUCATION: B.S. in mathematics with a minor in sociology, University of Michigan-Dearborn

AWARDS: Achievement Medal for Civilian Service (2008), Commander's award for Civilian Service (2013), Commander's award for Civilian Service (2014), 2015 David Packard Award for Excellence in Acquisition (team award), 2015 Project Management Team of the Year (team award), 2016 Under Secretary of Defense for Acquisition, Technology and Logistics Should Cost and Innovation Award (team award)

THE ACQUISITION ADVENTURE

Anisah Zeghir is a veritable force of nature. Bold, driven and known for her sense of adventure, she has something in common with famed explorer and mountaineer Sir Edmund Hillary, who said, "It's not the mountain we conquer, but ourselves." She loves the outdoors, yes, but it's about more than the fresh air or the views. Taking on a new challenge—like hiking or zip lining—is how Zeghir satisfies her own natural curiosity and ambition. "Every day is an opportunity to learn, try new things and get out of my comfort zone," she said.

From a very young age, her parents encouraged her to expand her horizons and explore the world around her—a life lesson they had learned firsthand. "My parents emigrated to the U.S. from Lebanon," she said. "They settled in Michigan, where I was born and raised, and they made sure that my siblings and I understood how fortunate we were to be growing up here." Zeghir was reminded to be grateful for things that are often taken for granted in the United States, like the ability to live without the constant threat of war. "I never had to experience that as a child, but my parents did," she said. "They always encouraged us to work hard, study and take advantage of the great opportunities in this country. I always wanted to do my part to give back."

That advice eventually led her to a career with the Army. Nearing the completion of her mathematics degree in college, she still wasn't sure of her next step. After hearing a prior graduate speak to students about his work with U.S. Army Tank-automotive and Armaments Command (TACOM), she knew she had found her professional home. "A TACOM representative came to campus and was describing his work and his daily routine as an operations research analyst for the Army," she said. "Immediately, I knew that was something I would love because it sounded challenging, unique and allowed me to give back." With her sights set on that job, Zeghir launched her career as an Army civilian. In her first position as—you guessed it—an operations research analyst for TACOM, she evaluated parts for Army vehicles, incorporating data about useful life span and other factors, to determine which ones to buy. "I love numbers and spreadsheets, and this was a way for me to do what I loved, while ensuring that taxpayers were getting the best product for their money," she said.

Today, Zeghir is the director of business management for the Program Executive Office for Combat Support and Combat Service Support (PEO CS&CSS) Joint Project Office for Joint Light Tactical Vehicles (JPO JLTV). "I manage cost, budget, schedule and acquisition in the Business Management Office to support the staffing of milestone decision authority packages, the preparation of portfolio and budget briefs and the completion of product-level taskers for JPO JLTV, which includes Joint Light Tactical Vehicles, Light Tactical Vehicles and Ground Mobility Vehicles." In short, she works to make sure warfighters get the equipment they need, on schedule and within budget.

During her 15 years with the Army, Zeghir's drive and curiosity have been instrumental to her success, but she credits leaders who encouraged her to take on new



AWARD-WINNING TEAM
Zeghir and the JPO JLTV team receive the David Packard Excellence in Acquisition Award in 2015. (Photo by U.S. Army)

challenges, as well. "In my career, I have always wanted to learn more and understand how multiple disciplines integrate or impact one another," she said. "I was fortunate to work with leaders who supported career-broadening experiences, especially outside my career field." And those two points—a focus on systems thinking and an emphasis on building strong relationships—form the basis of her advice to junior acquisition personnel today.

"The advice I have given them is to take their time and learn how their current role impacts and supports mission, especially how it impacts the Soldier," she said. "Getting to know the individuals I work with, what motivates them and their aspirations, allowed me to network both internally and externally, and those relationships were instrumental in successful task completion, meeting goals and ultimately getting the best possible product to the warfighter." Cooperation and collaboration became even more important to Zeghir in 2016, when grappling with the care of her mother's serious illness. Because she had built strong relationships with team members and stakeholders alike, she had the confidence to step away from work, knowing her team would continue the mission until she returned. "That meant so much to me—to allow me to focus on my mother and my family during that time, was invaluable," she said. Her experience reinforced for her the importance of building relationships and also served as a reminder that she's committed to serving the Army in any capacity she can.

So, what comes next for Zeghir? Time will tell, but she's setting her sights on the possibilities. "Currently, I am completing my Level III program management certification," she said. "It has given me the ability to integrate and solidify what I have learned on the job over the past 15 years in disciplines outside my career field, such as engineering and logistics." She said she is becoming more adept at strategic planning and forward thinking. "We never stop learning," she said. "No matter the career field, we all have one ultimate goal as Army civilians: support the Soldier." She's pursuing her goals and fulfilling her parents' wishes. "My greatest satisfaction in my career is the ability to give back," she said. "It's a small token of my appreciation for all the opportunities made available to me."

—ELLEN SUMMEY

SIX PLUS TWO EQUALS STEM

Developing uniformed strategic technologists: An opportunity in acquisition.

by Maj. John M. Williams II

The Army is piloting a program to help acquisition officers with advanced science, technology, engineering and math (STEM) degrees achieve their Ph.D.s. Recent changes in force structure—combining the requirements, science and technology (S&T) and acquisition communities into cross-functional teams (CFTs)—has highlighted the need for leadership with experience in all three arenas to support the teams' strategic planning efforts. Through this program, qualified officers can obtain a doctoral degree with three years of Advanced Civil Schooling (ACS). The Army, in turn, has a unique opportunity to shape the acquisition workforce by developing a pipeline of uniformed strategic technologists who can play a significant role in driving modernization.

ALL THE DETAILS

I learned about this program in the summer of 2018 after a call from the acquisition proponent office. I was selected to pilot this new program primarily based on my academic background. I hold a B.S. in chemistry and an M.A. in leadership, and I previously participated in ACS to earn an M.S. in biomedical engineering. There, I conducted advanced research on tissue engineering with human adipose-derived stem cells and biotechnology. Immediately after graduation, I served two years as a faculty member in the chemistry and life sciences department at the United States Military Academy at West Point, teaching general chemistry, facilitating a bioengineering course and leading independent research on malaria. After leaving West Point and completing acquisition training, I served as an assistant product manager at the Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) and at the U.S. Army Combat Capabilities and Development Command (DEVCOM) Chemical Biological Center.

After quickly accepting the offer to participate in this program, it was my responsibility to select a school, get accepted into a program and still meet all of the ACS requirements in time to have orders to start school



STUDENT WORKSHOPS

High school students from central Tennessee participate in STEM outreach workshops at the Vanderbilt Institute of Nanoscale Science and Engineering (VINSE), where students built solar cells and toured Vanderbilt's campus. (Photo courtesy of the author)

in the fall. I chose Vanderbilt University because of its reputation in research and its location. I chose a Ph.D. in the interdisciplinary material science program because it included an emphasis in the fields of chemistry, mechanical engineering and physics, while allowing me to transfer many of the credits from my previous graduate work.

The application process was somewhat standard, requiring transcripts, purpose statements and academic letters of recommendation, for which I leaned on previous colleagues at West Point and DEVCOM Chemical Biological Center. The biggest break in this process came from supporting my center director on a trip to the area. While accompanying him for official duties, I was able to tour Vanderbilt and other local universities, get briefed on local research efforts being funded by DOD and, most importantly, meet key faculty members within the material science program. I was accepted into the program, working under a faculty member who had experience with ACS officers and the short timelines imposed by the Army. This would ensure that I was in the best position to succeed. In July 2019, roughly nine months after first learning about the program, I arrived at Vanderbilt to get a head start on research before beginning classes.

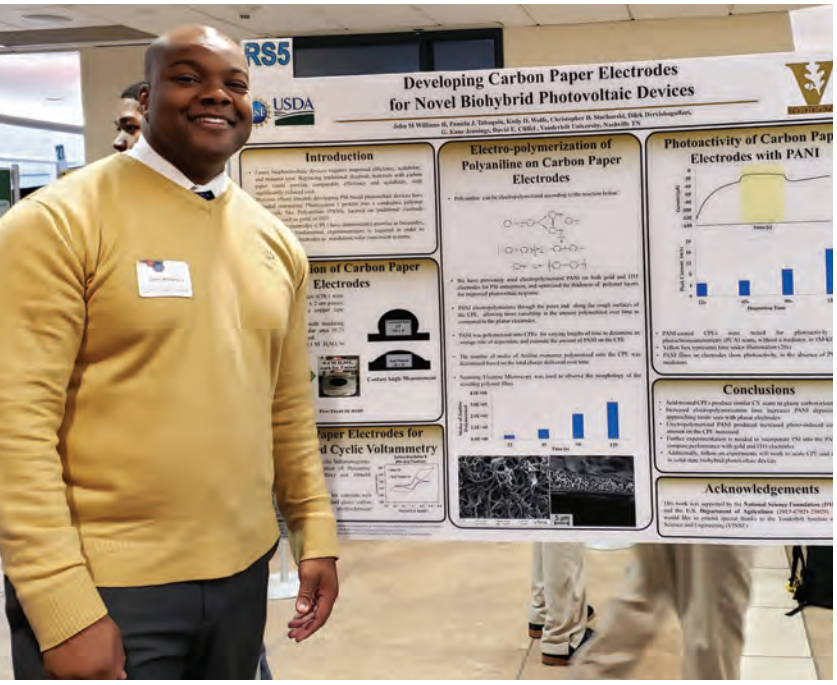
A JUGGLING ACT

Since arriving on campus, I have been balancing coursework with research and other ACS requirements, like interacting with the university Reserve Officers' Training Corps (ROTC) program. My research is focused on developing novel biohybrid photovoltaic devices for expeditionary energy, and my coursework has included topics like nanoparticles, atomic arrangements and electrochemistry. The program has included colloquiums with leading researchers from around the world speaking on breakthroughs in material science and associated fields. I have also been able to take advantage of the Vanderbilt Institute of Nanoscale Science and Engineering's (VINSE) state-of-the-art facilities and equipment, learning to fabricate and characterize materials at the nanoscale. While the pace and coursework has been challenging, it was necessary to frontload the requirements to ensure I will graduate by May 2022.

Beyond the academic requirements, I have worked to stay connected with the acquisition community and Army modernization efforts. In April 2019, U.S. Army Futures Command (AFC) signed a formal education partnership agreement with Vanderbilt University to codify the efforts of the university to innovate with Soldiers from nearby 101st Airborne Division. I have been able to provide briefings on AFC, the modernization priorities and the language of large-scale combat operations to university leaders. While these briefs are informal, the aim is to better prepare the staff and faculty to interact with AFC and the units from the 101st. Additionally, I have connected with scientists at the Army Research Laboratory (ARL) whose projects are similar to my research efforts. We plan to have an ARL scientist on my Ph.D. committee in order to codify the relationship between the Army lab and the university research group, as well as to ensure the Army is able to directly benefit from my research while in the program.



KEEP IT CLEAN
The author learned to fabricate gold wafers using electron beam deposition tools within the VINSE clean room. (Photo courtesy of the author)



SEE HERE
The author presented his research at the VINSE Nanoday 2019 poster competition. (Photo courtesy of the author)

I hold a B.S. in chemistry and an M.A. in leadership, and I previously participated in ACS to earn an M.S. in biomedical engineering.

Lastly, I have had the opportunity to interact with a number of other officers on campus who are earning their degrees through ACS. While most are post-command captains earning MBAs, I met three field-grade officers working toward doctorates in American politics. These officers are a part of the U.S. Army Strategic Planning and Policy Program run at the U.S. Army Command and General Staff College. Their program includes two years of coursework at a top university, additional training in strategic studies at Fort Leavenworth and a developmental assignment in a strategic planning position. The program was established by former Army Chief of Staff Gen. Raymond T. Odierno to address a shortage of military officers who could think strategically. These officers are highly competitive and come from all branches of the Army. While the new acquisition officer Ph.D. program has some key differences from the Army Strategic Planning and Policy Program, the vision and outcomes align well with the aims of Dr. Bruce D. Jette, assistant secretary of the Army for acquisition, logistics and technology, specifically for developing future Army acquisition leaders with strategic and technical acumen, credentials and skills.

SUPPLY AND DEMAND

The need for uniformed technologists is not new, nor is the effort to develop these types of officers. Leaders within the Army acquisition community have long wanted to leverage officers with STEM backgrounds to lead more technical programs, with the idea that greater familiarity with the technology could improve decisions about program cost, schedule and performance. Both the Defense Threat Reduction Agency and the Defense Advanced Research Projects Agency (DARPA) leverage advanced researchers with Ph.D.s as project managers within their science and technology organizations. An earlier acquisition branch program to develop officers with doctoral degrees, the Uniformed Scientist and Engineer Program, ended in 2010, due in part to a lack of career progression opportunities for these officers, and the need to focus the workforce on other acquisition priorities.

The acquisition proponent has recognized the need for more officers with STEM degrees and has invested in outreach at both

the U.S. Military Academy and at ROTC advance camps to introduce future officers earlier to the acquisition functional area. Additionally, the recently established 75th Innovation Command will leverage reservists with educational or occupational expertise within critical STEM fields to support AFC. The Army Medical Department (AMEDD) uses officers who already hold advanced degrees in STEM fields to lead their acquisition efforts by cross-training them as acquisition officers with an additional skill identifier. AMEDD officers can compete for centrally selected project manager and product manager positions for both medical and traditional acquisition needs.

My last duty as assistant program manager for science and technology portfolio integration at the DEVCOM Chemical Biological Center allowed me to see firsthand the need for acquisition officers with STEM backgrounds. As one of two military personnel at the center, my primary duties could be reduced to one word: translation. It was my responsibility to translate conversations involving our technologists (scientists and engineers), the requirements community we supported, and the program offices where we hoped to transition. This included participating in major tabletop exercises, doctrine reviews and developing operational scenarios for live test or demonstrations with the technology. This was especially critical in trying to align the efforts of our center with the Army modernization priorities and participating with the different cross-functional teams. While our center focused on chemical and biological defense, understanding the programs and technologies being developed by the cross-functional teams would allow the center to align its research efforts to better meet the survivability requirements for future combat operations. Understanding how to make these connections, though, requires leaders who understand the technology, the program timelines and the concept of operations. Officers who began their careers in a basic branch, served as an assistant program manager in a PEO, and who have conducted rigorous academic research have the opportunity to serve as a bridge between these different communities, specifically assisting in communicating the needs of the warfighter, the processes of acquisition, and both the limits and capabilities of new technology.

In addition to roles within DEVCOM and the PEOs, uniformed strategic technologists could serve CFTs by better linking the impacts of separate S&T efforts on the overall mission of the CFTs, which may support difficult decisions like funding cuts, program timelines and requirements trade-offs, increasing the overall impact of the initial research investments. To reach that level of synergy requires a dedicated effort from those who understand and can communicate the research, the programs and the concept of operations. Having officers serve as strategic technologists in various roles throughout, AFC can help ensure modernization efforts are rooted in warfighter needs and aligned with the program requirements. Further, they may be able to support the efforts of the Army senior research scientists, the 42 flag-level civilian scientists within DEVCOM who help direct Army research in their specific fields. While these officers would not replace their civilian counterparts, their uniformed status and recent operational experience could supplement the efforts of the senior research scientists and extend their reach.

CONCLUSION

Beyond the individual benefit to the officer, this new program provides other advantages to the Army and its science and technology organizations. The presence of an active-duty officer within a research group at a prestigious academic institution creates a link that can be leveraged for years to come. These informal links bolster the efforts by ARL and AFC to better connect with academia, ensuring the Army can tap into these institutions and resources to tackle future challenges. This effort could also leverage the U.S. Military Academy process of educating officers in technical fields, conducting an operational



REACH OUT

The author has connected with scientists at DEVCOM'S Army Research Laboratory (ARL) whose projects are similar to his. (Photo by T'Jae Ellis, ARL)

A ROAD MAP TO SUCCESS

I am confident that pursuing a doctorate through ACS was the right decision for me; I would make the following recommendations to others who are interested:

- **Start early.** If you are currently in ACS or have recently completed your master's degree, start thinking about whether you would want the terminal degree. The earlier you plan to incorporate this program into your professional timeline, the less constrained you will be by board dates or other requirements.

- **Build your academic network.** Reach out to the Army S&T community (DEVCOM, U.S. Army Engineer Research and Development Center, DARPA, etc.) and leverage the U.S. Military Academy. This can lead to connections with schools, projects and faculty members to simplify the process of getting into a good school and graduating. The academy sends several active-duty officers to Ph.D. programs every year under similar circumstances. DOD funds a number of faculty research groups, and they are often more open to accepting military officers as researchers. If you already have a master's, reach out to your old group first. You will need them for letters of recommendation anyway, and usually they will want you back in their lab.

- **Be proactive when reaching out to schools.** Try to narrow your school search quickly. Then interact with the program administrators as quickly as possible, as you will need them to meet all of the ACS document requirements. Many of these programs are trying to recruit graduate students, especially those with a security clearance who come with their own funding. Try to attend the recruitment activities if possible. The normal window for acceptance for the fall is usually in late spring, beyond the December ACS application deadline. If you have picked a program and faculty adviser before the selection board, you may be able to submit all the required documents without the official acceptance letter.

- **Get your ACS packet ready early.** Know all of the requirements from ACS and start gathering them as quickly as possible. Know who you are requesting letters from in advance, have unofficial copies of your transcripts to share for an admissions decision, and get your application in as soon as you can.

- **Know your professional timeline.** This is a major commitment in time and effort that will change your trajectory as an Army officer. You are responsible to ensure that you are in the best position to meet all of your professional timeline requirements. A number of new initiatives may help, but it is ultimately up to you to make these decisions. I recommend having an honest conversation with your supervisor and branch manager to discuss your professional timeline and determine if this opportunity is right for you. It is also important to remember that this opportunity comes with an active-duty service obligation of two years for each year of graduate school.

—MAJ. JOHN M. WILLIAMS II

My research is focused on developing novel biohybrid photovoltaic devices for expeditionary energy.



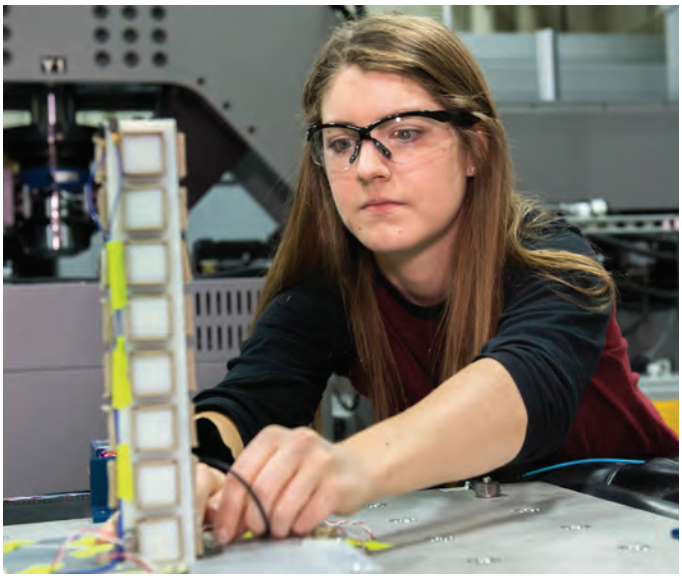
VITAL LINK
Researchers from ARL and Texas A&M University developed a first-of-its-kind, 3D printable and stimuli-responsive polymeric material expected to open new opportunities for future military platforms. The author notes that officers with doctorates can link these communities and ensure the warfighter is being listened to. (Photo by T'Jae Ellis, ARL)

utilization, then teaching and leading research at the academy. Having served as faculty at the academy, I have observed great Army officers translate advanced technical concepts to cadets in terms of impact on the force, and seen how those skills can be applied to modernization.

I am confident this opportunity will draw talented officers to make greater commitments to the acquisition workforce. I am optimistic that continuing to support this opportunity will produce long-lasting and valuable outcomes for the Army. It is an opportunity we cannot let pass by.

For more information about the program, contact Maj. Laura Freeland, ***laurajane.r.freeland.mil@mail.mil*** *at Office of the Director, Acquisition Career Management (DACM).*

MAJ. JOHN M. WILLIAMS II is a Ph.D. student in the interdisciplinary material science program at Vanderbilt University. He earned an M.S. in biomedical engineering from University of North Carolina, Chapel Hill, an M.A. in leadership from University of Texas, El Paso, and a B.S. in chemistry and life science from the U.S. Military Academy. He is certified Level III in program management and Level I in engineering, and is an Army Acquisition Corps member.



OTHER AVENUES
University of Michigan doctoral candidate Brittany Essink observes how intricately designed dampeners affect structural design during testing at ARL at Aberdeen Proving Ground, Maryland. DOD selects 54 students pursuing doctorate degrees in military-relevant research topics to receive a three-year National Defense Science and Engineering Graduate fellowship. (Photo by David McNally, ARL)

ON THE MOVE



OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY FOR ACQUISITION, LOGISTICS AND TECHNOLOGY





1. NEW PRINCIPAL DEPUTY ASA(ALT)

In December, **William H. Buckey** became the principal deputy to the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)). advising the assistant secretary and senior Army leadership on the full range of matters relating to Army acquisition, procurement, research and development and logistics. As such, Buckey plays a leading role in developing policies, programs and processes to execute the Army's acquisition efforts.

Buckey, who previously served as acting deputy assistant secretary of the Army (DASA) for strategy and acquisition reform, succeeds **Jeffrey S. White**, who was the principal deputy for three years until leaving the position in October. **Margaret E. Boatner** is serving in the DASA position in an acting capacity.

Before joining the Office of the ASA(ALT), Buckey, a retired U.S. Marine Corps colonel, was the U.S. Department of State's senior civilian adviser to the assistant secretary of defense for political-military affairs. Previously, he served as the principal assistant deputy undersecretary of defense for the Office of Defense Research and Engineering and as director of the Militarily Critical Technologies Program, for which he managed the Damage Assessment Management Office, which assesses loss of U.S. defense technology from unauthorized access to DOD contractor computer networks. He has been a member of the Senior Executive Service since August 2005, when he began a two-year stint as the senior adviser to NASA's administrator for aeronautics.

Buckey has held a variety of positions in the defense industry and on congressional staffs as well. He holds an M.A. in national security and strategic studies from the U.S. Naval War College and a B.A. in international affairs from California State University.

2. WEIRICK ADVANCES TO DASA FOR PROCUREMENT

Rebecca Weirick, formerly the senior services manager and civilian deputy to the deputy assistant secretary of the Army for procurement (DASA (P)), was appointed to that position in June. As DASA (P) she's responsible for all aspects of procurement in the acquisition, life-cycle management and sustainment of Army weapon systems and equipment. This encompasses research and development, test and evaluation, acquisition, logistics, fielding and disposition. The staff of skilled contracting professionals Weirick leads provide operational support contracting that benefits Soldiers, along with contingency contracting support to the geographic combatant commanders. As the functional career representative for contracting, she oversees the recruitment, training, certification and professional development of the military and civilian contracting workforce, more than 8,000 strong worldwide, who execute programs worth more than $100 billion annually.

In her previous position, Weirick provided leadership in the acquisition of Army services, with responsibility for a portfolio of more than $200 billion in contracts across the Army. She oversaw acquisition planning, competitive selection processes and performance-based acquisition; ensured deployment of proper management controls for service acquisitions; and advised the Army acquisition executive on all matters related to service providers. She came to Army procurement from the Air Force, where she rose to senior leadership in the procurement field, retiring from the service as a colonel in 2010.

Weirick holds an M.S., in national resource strategy from the Industrial College of the Armed Forces, an M.A. in procurement management from Webster University, and a B.A. in English, philosophy and economics from the University of Nebraska. She is Level III certified in contracting and in program management, and is a Certified Associate Contracts Manager.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3. CHIEF SYSTEMS ENGINEER OVERSEES CRITICAL INTEGRATION

Jeannette Evans-Morgis, as the chief systems engineer for the ASA(ALT), is spearheading a vision of integrating systems engineering to modernize the Army. At the same time, she oversees systems engineering for ASA(ALT) in support of the Army materiel enterprise, that equipment to be delivered to Soldiers meets the needs of their missions against any potential adversaries. Appointed to the Senior Executive Service in December 2015, Evans-Morgis came to ASA(ALT) in 2019 to run the Office of the Chief Systems Engineer (OCSE), a position created in March of that year.

OCSE's mission is to maintain a standards-based architecture for Army-level integrated modernization—in particular, configuration management and interoperability across the six computing environments—and to ensure that program managers are aware of the standards. OCSE works with the materiel development community, requirements developers, Department of the Army staff, and organizations at the joint and coalition levels that determine standards to identify the ones the Army needs to win our nation's wars.

Before joining ASA(ALT), Evans-Morgis worked for the U.S. Marine Corps for at least 10 years in various civilian systems engineering positions, ranging from lead systems engineer for the Tomahawk Weapons Control System, Dahlgren Division K71 team, Naval Sea Systems Command Surface Warfare Center to Marine Corps Systems Command's deputy to the commander for systems engineering and acquisition logistics.

She holds an M.S. in electrical engineering from Drexel University and a B.S. in electrical engineering from George Washington University. A member of the Defense Acquisition Corps, Evans-Murgis is Level III certified in program management and in systems engineering, and is twice the recipient of the Navy Meritorious Civilian Service Award.

4. CHIEF TECHNOLOGY OFFICER PROMOTES INNOVATION, COLLABORATION

As the Army looks continuously to a broader mix of partners for innovative materiel and methods with which Soldiers can win wars, **Dr. William Cohen** advises the ASA(ALT) on how best to leverage technology to enhance and advance Army capabilities. Cohen, chief technology officer since November 2018, is involved in all aspects of emerging technologies, from applied research and technology development programs to prototyping and operational deployment.

He provides technical insight, independent analysis and access to private sector innovators and technology leaders who have promising concepts, prototypes, mature technologies and strategies that integrate with ASA(ALT)'s and U.S. Army Futures Command's shared mission to enhance and advance Army capabilities for a competitive advantage against adversaries. In the process, Cohen works with stakeholders at all echelons to synchronize initiatives and share knowledge.

Previously, Cohen was a principal engineer at Exponent Inc., a science and technology consulting firm, where he addressed capability gaps for deployed warfighters, drove iterative product design and performed technology assessments. While at Exponent, he spent three years embedded with the U.S. Army Rapid Equipping Force (REF) in Iraq, leading teams in Iraq and Afghanistan in harnessing current and emerging technologies to deliver solutions that improved Soldier safety, enhanced capabilities and mitigated risk. After returning from Iraq, Cohen led Exponent's expeditionary engineering efforts, designing mobile prototyping laboratories for REF and supporting teams overseas. He was chief proponent of Exponent's MARCbot robot, used for remote inspection of potential improvised explosive devices, and led the development of the Rapid Deployment Integrated System to provide perimeter security for joint security stations and combat outposts in theater.

Cohen earned a Ph.D. in industrial engineering and an M.S. in engineering psychology from the University of Wisconsin – Madison, and a B.A. in psychology from the University of California San Diego.

JOINT PROGRAM EXECUTIVE OFFICE FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR DEFENSE

5. NEW LEADERSHIP AT JPL CBRN

In a small ceremony on Oct. 28 in Stafford, Virginia, **Michael J. Poe** assumed the role of the Joint Project Lead for Chemical, Biological, Radiological and Nuclear Special Operations Forces (JPL CBRN SOF) of the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND). Poe is the senior civilian for leading and directing the JPL CBRN SOF team to rapidly acquire and equip special operations forces and special purpose units with critical chemical, biological and radiological defense equipment necessary to fill capability gaps and underwrite mission success. Poe's wife, **Misty Poe**, attended the ceremony, as did **Brig. Gen. Arthur J. Pasagian**, commander of Marine Corps Systems Command, and **Douglas Bryce**, the JPEO-CBRND executive officer, among other guests.

Poe served in the U.S. Marine Corps for more than 20 years at the brigade, battalion and company levels. His assignments include motor transport operator, motor transport chief, truck master and Marine Corps drill instructor. He retired from active duty in December 2013.



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PROGRAM EXECUTIVE OFFICE FOR AVIATION

1: A2E2 HAS NEW PRODUCT MANAGER

Lt. Col. John Seitz assumed responsibility as the product manager for the Aviation Architecture and Environment Exploitation (A2E2) product office from **Ray Scarborough** during a change of charter ceremony July 23 on Redstone Arsenal, Alabama. Deputy Product Manager Scarborough had been acting as the product manager since June 9, following the departure of former product manager **Shawn Gresham**. The A2E2 product office is part of the Aviation Mission Systems and Architecture project office of the Program Executive Office (PEO) for Aviation.

2. LEADERSHIP CHANGE FOR APACHE PM

Forrest Collier, center left, deputy project manager (PM) for the Apache Attack Helicopter project office at PEO Aviation, prepares to execute a socially distanced passing of the colors during a change of charter ceremony July 16 on Redstone Arsenal. Program Executive Officer for Aviation **Brig. Gen. Robert L. Barrie Jr.**, right, presided over the proceedings as the outgoing PM, **Col. Tal Sheppard**, center, relinquished responsibility of the Apache Attack Helicopter Program to **Col. John "Jay" Maher**, left. Maher most recently served in the G-3/5 Strategic Plans and Concepts office for the U.S. Army Contracting Command. (Photo by Shannon Kirkpatrick, PEO Aviation)

3. LEADERSHIP CHANGE AT MASPO

Col. Tim McDonald, left, accepts the Multi-National Aviation Special Project Office (MASPO) charter from **Col. John Vannoy**, right, during a ceremony Sept. 30 on Redstone Arsenal. PEO Aviation's **Sgt. Maj. Woody Sullivan**, center left, and deputy PEO **Patrick Mason**, center right, participated in the socially distanced ceremonial passing of the MASPO flag. Vannoy served as MASPO's PM for 26 months and retired from the Army on Oct. 30. McDonald's previous position was in PEO Aviation headquarters, where he was the lead for aviation efforts within Afghanistan. (Photo courtesy of PEO Aviation)

4: MEDEVAC PRODUCT OFFICE CHANGE OF CHARTER

Lt. Col. Seth Swartz, left, assumed responsibility for the Medical Evacuation product office from the outgoing product manager, **Col. Josephine Thompson**, right. **Col. Calvin Lane**, PM for the Utility Helicopters project office, presided over the event Aug. 7 on Redstone Arsenal. Swartz previously served as the deputy chief of the Medical Evacuation Concepts and Capabilities Division at Fort Rucker, Alabama. Thompson retired from the Army on Sept. 16 after 24 years of service. (Photo by D.B. Swaine, PEO Aviation)







5: NEW PRODUCT MANAGER FOR SPECIAL ELECTRONIC MISSION AIRCRAFT

Col. James DeBoer, left, PM for PEO Aviation's Fixed Wing project office, welcomed **Craig Besaw** as the new product manager for the Special Electronic Mission Aircraft during a change of charter ceremony July 31 on Redstone Arsenal. Besaw took over responsibility from former product manager **Lt. Col. Jeff Jablonski**, who is currently serving as assistant program executive officer for G3 Operations in PEO Aviation headquarters. (Photo by Tracey Ayres, PEO Aviation)

6: UH-60M PRODUCT OFFICE CHANGES HANDS

Lt. Col. Joseph Alexander, left, assumed responsibility for the UH-60M product office from outgoing product manager **Ed Gozdur**, right, during a change of charter ceremony July 23 on Redstone Arsenal. **Col. Calvin Lane**, center, PM for PEO Aviation's Utility Helicopters project office, presided over the event. Alexander previously served as the product director for Scout and Attack in the Multi-National Aviation Special Project Office. Gozdur leaves PEO Aviation to become commander of the Defense Contract Management Agency, Central Region. (Photo by D.B. Swaine, PEO Aviation)

7: CEREMONY CAPS CAREER OF 32 YEARS

Maggi Patton was honored in a retirement ceremony Oct. 26 at the PEO Aviation campus on Redstone Arsenal. She was awarded the Department of the Army Meritorious Civilian Service Medal and received the Order of Prometheus Medallion from the Pathfinder Chapter of the Association for Unmanned Vehicle Systems International for her contributions toward advancing unmanned systems. Patton's civilian service began in 1988 with the programming, development and support for the nonappropriated fund accounting system in Heidelberg, Germany, and culminated with her three years as product director of the Common Systems Integration product office in PEO Aviation's Unmanned Aircraft Systems project office. (Photo by David Hylton, PEO Aviation)



PROGRAM EXECUTIVE OFFICE FOR COMMAND, CONTROL AND COMMUNICATIONS – TACTICAL

8. NEW LEADERSHIP AT PL I2S

Matthew R. Maier was recently selected as the project lead for Interoperability, Integration and Services (PL I2S) within the Program Executive Office for Command, Control and Communications **–** Tactical (PEO C3T).

In his responsibility for I2S, Maier will lead personnel supporting command post integrated infrastructure, common hardware systems, tactical cyber and network operations, and tactical network initialization and configuration. He will also oversee the development and integration of the Army's network capability sets, which modernize the tactical network through an iterative process infused with cutting-edge commercial solutions informed by Soldier-led experimentation.

Maier currently serves as product manager for Network Modernization at PEO C3T. He has more than 30 years in the Defense Acquisition Workforce and has supported multiple Army acquisition organizations in program management roles, including the program executive offices for Intelligence, Electronic Warfare and Sensors (PEO IEW&S), Enterprise Information Systems (PEO EIS), and Simulation, Training and Instrumentation (PEO STRI), as well as the Systems of Systems Engineering and Integration Directorate (formerly the PEO for Integration). He has also held key positions in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, the U.S. Army Communications-Electronics Command, the DOD Joint Spectrum Center, the Naval Air Warfare Center Training Systems Division and Naval Air Warfare Center Aircraft Division.

PROGRAM EXECUTIVE OFFICE FOR ENTERPRISE INFORMATION SYSTEMS

1. CHANGE OF CHARTER AND REBRANDING OF AESIP

Col. Robert J. "Rob" Wolfe assumed the charter of the newly rebranded Army Data and Analytics Platforms (ARDAP), at a virtual change of charter and renaming ceremony July 31 at the Program Executive Office for Enterprise Information Systems (PEO EIS). During the ceremony, **Col. Robert "RJ" Mikesh** relinquished the charter for the Army Enterprise Systems Integration Program (AESIP).



Wolfe previously served at PEO EIS as the product manager for the Army Contract Writing System. During that assignment, he was tasked to lead the effort to deliver the Army Leader Dashboard (now Army Vantage) and establish the PEO EIS Strategic Initiatives Group.

As the project management office succeeding AESIP, ARDAP aims to help the Army improve information readiness and data agility by providing modern data and decision support tools and platforms, harnessing data across defense business systems and modernizing the Army's training management system.

Mikesh, who began serving as project manager for AESIP in August 2017, was selected in May to join the Operation Warp Speed Task Force, the national program to accelerate the development, manufacturing and distribution of COVID-19 vaccines, therapeutics and diagnostics.



2. CHANGE OF CHARTER AT DCO

Col. Mark Taylor assumed responsibility as project manager of PEO EIS's Defensive Cyber Operations (DCO) from **Col. Chad Harris** at a virtual change of charter ceremony on July 30. Taylor previously was the acting director of investments in the Army Budget Office, where he was responsible for the budgeting and execution of the Army's $34 billion research and development and procurement portfolio.

3. ASSUMPTION OF CHARTER AT EC2M

Deidra McCaskill accepted the charter of PEO EIS's Product Lead for Enterprise Content Collaboration and Messaging (EC2M) in a virtual assumption of charter ceremony Aug. 20. As product lead for EC2M, McCaskill—who previously served both as acting and deputy product lead—will head up the office that oversees the Army's collaboration, messaging and access management solutions.

4. NEW LEAD AT LOGISTICS INFORMATION SYSTEMS

Program Executive Officer for Enterprise Information Systems **Ross R. Guckert** was joined by five former program executive officers and other Army leaders Aug. 27 to welcome **James O. Winbush Jr.**, pictured, as the new Logistics Information Systems (LIS) product lead and to celebrate the retirement of outgoing LIS product lead **Ricky Daniels.** Winbush previously served as director of the Earned Value Management Systems Center at the Defense Contract Management Agency.

5. LEADERSHIP CHANGE IN GFIM

Jason "JT" Craft assumed the charter for the PEO EIS Global Force Information Management (GFIM) product office Oct. 20 in a virtual ceremony. As product lead for GFIM, which is part of the PEO EIS ARDAP portfolio, Craft will oversee the acquisition and fielding of a program that will automate the Army's core business process known as deploy-to-redeploy/retrograde, spanning force structure, readiness, manning, equipping, resourcing and sustainment. Craft is a retired Army officer with over 30 years of service and over 20 years' experience as an acquisition professional.











6. CHANGE OF CHARTER AT AESIP HUB

Matt Gohil officially assumed the role of product lead for the PEO EIS AESIP Hub—part of the ARDAP portfolio—during a virtual change of charter ceremony Nov. 4. Gohil assumed the charter from **Nancy Richardson**, who recently became acting deputy project manager for Defense Communications and Army Transmission Systems. Previously, serving as the AESIP Hub deputy product lead, Gohil reengineered many internal policies and procedures to meet Army audit requirements and improve efficiencies across the organization. He also previously served as the operations director for the PEO's Program Protection and Planning division, where he helped introduce the quarterly newcomers' orientation.

7. NEW PRODUCT LEAD FOR ARMY VANTAGE

Miranda Coleman assumed the charter of the PEO EIS Army Vantage product office, which is part of the ARDAP portfolio, during a virtual ceremony Nov. 20. As product lead for Army Vantage, Coleman will head up the office that is fielding a comprehensive data management platform that enables the Army to "see itself" and make data-driven decisions.

ARMY OFFICER ANNOUNCEMENTS

Army Chief of Staff Gen. James C. McConville announced the following officer assignments, promotions and retirements:

Brig. Gen. James P. Bienlien, director, Requirements Integration Directorate, Futures and Concepts Center, U.S. Army Futures Command, Joint Base Langley-Eustis, Virginia, to deputy commanding general, Combat Capabilities Development Command and senior commander, Natick Soldier Systems Center, U.S. Army Futures Command, Natick, Massachusetts.

Brig. Gen. William M. Boruff to deputy commander, Combined Security Transition Command – Afghanistan, U.S. Forces – Afghanistan, Operation Freedom's Sentinel. He most recently served as deputy commanding general, U.S. Army Contracting Command, Redstone Arsenal, Alabama.

Brig. Gen. Douglas S. Lowrey, director for contracting, Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, Washington, to commanding general, U.S. Army Security Assistance Command, Redstone Arsenal, Alabama.

PROMOTIONS

The following general officers were promoted to the rank indicated below in October and November 2020:

Lt. Gen. Dennis S. McKean, currently serving as deputy commanding general, Futures and Concepts, U.S. Army Futures Command, Joint Base Langley-Eustis, Virginia, with duty in Austin, Texas.

Brig. Gen. Douglas S. Lowrey, currently serving as commanding general, U.S. Army Security Assistance Command, Redstone Arsenal, Alabama.

Brig. Gen. Glenn A. Dean III, then serving as Deputy for Acquisition and Systems Management, Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, Washington; now serving as Program Executive Officer for Ground Combat Systems, Detroit Arsenal, Michigan.

RETIREMENTS

Lt. Gen. Bruce T. Crawford completed more than 34 years of service and concluded his distinguished career as chief information officer/G-6, Office of the Secretary of the Army, Washington.

Lt. Gen. Todd T. Semonite completed more than 41 years of service and concluded his distinguished career as chief of engineers and commanding general, U.S. Army Corps of Engineers, Washington.

(YOU'VE GOT THE) WRITE STUFF



PSSST. HEY, YOU! (YES, YOU.)

DID YOU KNOW THAT ARMY AL&T WANTS TO HEAR YOUR IDEAS ABOUT ACQUISITION? IT'S TRUE. ALL YOU NEED IS A GOOD IDEA.

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Dr. Bruce D. Jette
Army Acquisition Executive
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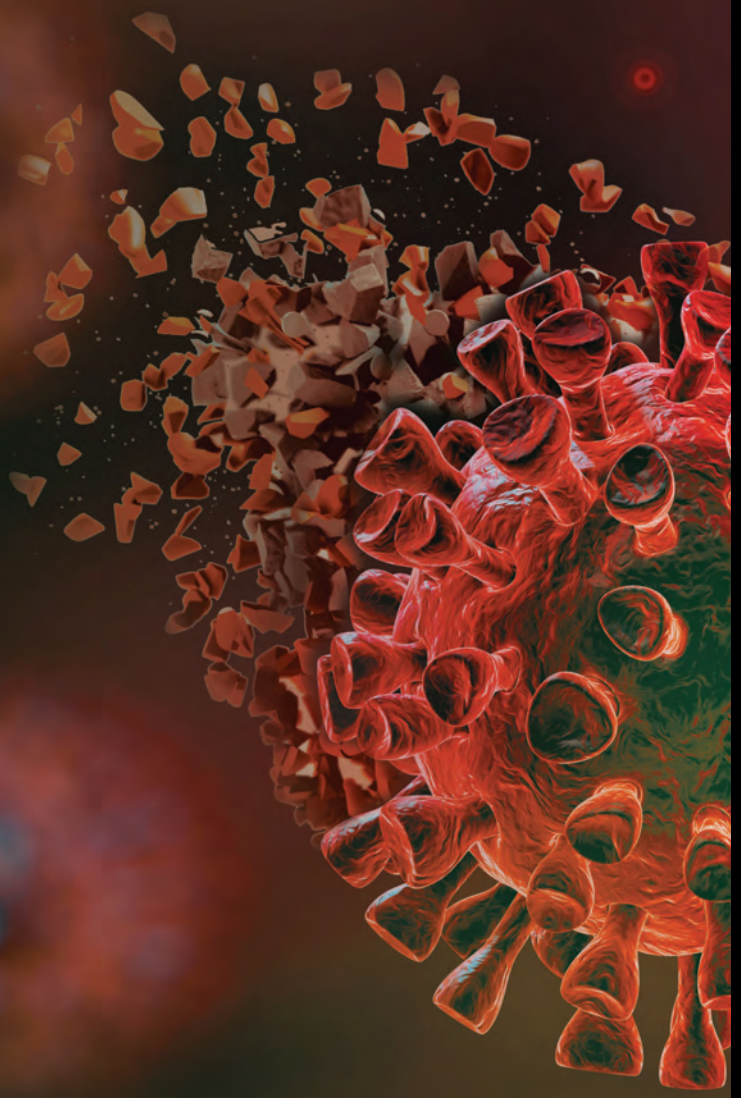

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