AMC TODAY

SUSTAINING THE STRENGTH OF THE NATION

U.S. ARMY MATERIEL COMMAND MAGAZINE JANUARY – MARCH 2017

IN THIS ISSUE: **DEVELOPING AND ENABLING THE FUTURE FORCE**

VANTAGE POINT

GENERAL GUS PERNA
ARMY MATERIEL COMMAND COMMANDING GENERAL

The U.S. Army Materiel Command owes it to the American people to ensure the Army's greatest resources – our Soldiers – are ready to succeed in any situation, from predictable, cyclic deployments, to no-notice expeditionary operations. As our global environment continues to shift at a faster speed than ever before, Army Materiel Command's priorities align with the Army's to sustain the current-to-future force by utilizing state-of-the-art technologies, materiel life cycle support and integrated logistics.

"WE ARE LASER-FOCUSED ON ENSURING OUR INNOVATION INVESTMENTS ... PROVIDE SOLUTIONS TO OUR WARFIGHTERS' CHALLENGES."

This issue of *AMC Today* explores how the Army Materiel Command is providing for the future force, focused on two key areas: our workforce and our Army equipment.

As the Army's senior logistician, I have had the unique opportunity to observe, learn and leverage how logistics is managed, from the most junior Soldier and Department of the Army Civilian, to the most senior leaders. The logistics and sustainment workforce is made up of experts with unique skillsets who have one common goal in mind: provide for the warfighter. As a people business, we are rightly focused on developing our workforce and executing a talent management system that places the right talent in the right position – a win-win for our workforce and our Army.

We have the tools, blueprints and drive to provide our workforce the coaching, mentoring, education and broadening assignments that will ensure 100 percent of the people do 100 percent of the work. We owe it to the workforce to invest in their future, and we owe it to our Army to recruit and retain the best talent to serve – in the civilian and military ranks.

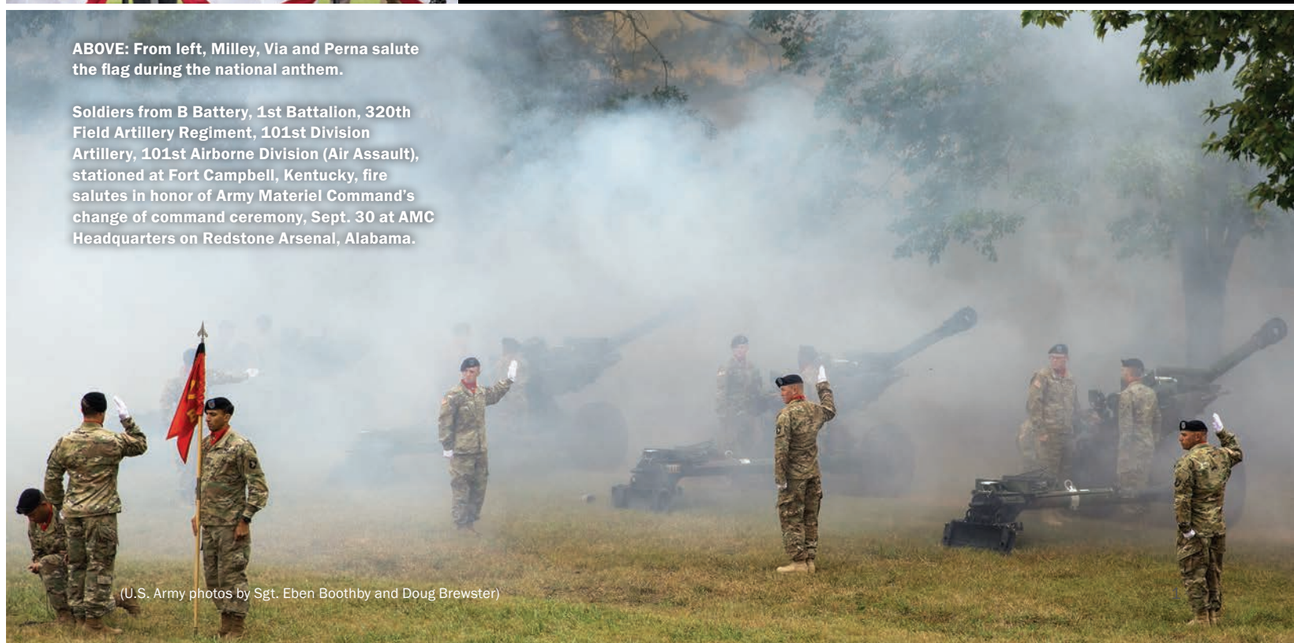
As we embark on a new year, our sights remain focused on ensuring our Army's equipment is modernized, maintained and in the best condition for our Soldiers. Today's adversary fights digitally, and in many cases, unconventionally. As the world's premier fighting force, the U.S. Army must not only match those powers, we must exceed their capabilities in every way.

The pages that follow detail how our Life Cycle Management Commands are hard at work sustaining and upgrading our Army's equipment, and feature advances in science and technology that ensure the latest and greatest equipment is made readily available to our Soldiers. We are laser-focused on ensuring our innovation investments are aligned to meet the requirements on the battlefield and provide solutions to our warfighters' challenges.

We have the greatest logistics corps in the world, and together, we will develop and provide for a future force capable of defeating any adversary.

Chief of Staff of the Army Gen. Mark A. Milley passes the guidon to Army Materiel Command Commander Gen. Gus Perna during the change of command ceremony between Perna and outgoing Commander Gen. Dennis L. Via.

FOUR-STAR COMMAND CHANGES LEADERSHIP



ABOVE: From left, Milley, Via and Perna salute the flag during the national anthem.

Soldiers from B Battery, 1st Battalion, 320th Field Artillery Regiment, 101st Division Artillery, 101st Airborne Division (Air Assault), stationed at Fort Campbell, Kentucky, fire salutes in honor of Army Materiel Command's change of command ceremony, Sept. 30 at AMC Headquarters on Redstone Arsenal, Alabama.

(U.S. Army photos by Sgt. Eben Boothby and Doug Brewster)

CONTENTS

FRONT AND BACK COVERS:
Army researchers are working on systems such as the Warrior Web prototype to help reduce Soldier fatigue and improve their ability to perform their mission. (Department of Defense photo)

Photo concept and artwork by Ken McMurrain.

AMC TODAY MAGAZINE

COMMAND STAFF

Gen. Gus Perna
Commanding General

Command Sgt. Maj. James K. Sims
Command Sergeant Major

Lt. Gen. Larry Wyche
Deputy Commanding General

Ms. Lisha H. Adams
Executive Deputy to the Commanding General

Maj. Gen. Allan Elliott
Deputy Chief of Staff

EDITORIAL STAFF

Col. Richard Spiegel, Director of Public and Congressional Affairs

Kim Hanson, Managing Editor

Elizabeth Behring, Editor

CONTRIBUTORS

Melissa Bullard

Matt December

Susan Farrow

Mara Gecan

Ken McMurrain

AMC Today is an authorized publication to inform and educate members and partners of DOD and the U.S. Army Materiel Command. Contents of *AMC Today* are not necessarily the official views of, or endorsed by, the U.S. Government or the Department of the Army. The editorial content of this publication is the responsibility of the AMC Public Affairs Office.

EDITORIAL OFFICE INFORMATION
AMC Today welcomes feedback from readers. Feedback can be submitted via email and must include sender's name, phone number and valid email address. Send feedback emails to: usarmy.redstone.usamc.mbx.public-affairs@mail.mil

The Editorial Office of *AMC Today* is located at:
U.S. ARMY MATERIEL COMMAND
OFFICE OF PUBLIC & CONGRESSIONAL AFFAIRS
4400 MARTIN RD.
REDSTONE ARSENAL, AL 35898
PHONE: 256.450.7000

PERSPECTIVES

Featuring this issue's guest columnist

LIEUTENANT GENERAL AUNDRE F. PIGGEE
DEPARTMENT OF THE ARMY DEPUTY CHIEF OF STAFF, G-4 (LOGISTICS)

ENABLING READINESS THROUGH STRATEGIC EQUIPMENT REDISTRIBUTION

One of the most important ways we can immediately improve readiness in 2017 is by tackling the burden units have with excess equipment. During the past 16 years, the U.S. Army has been unmatched in the quality and quantity of equipment brought to the battlefield. However, some of this equipment is now obsolete or no longer required, and other equipment is needed in places where units have shortages.

> "THERE IS HARD WORK AHEAD OF US, BUT IT IS SETTING UP OUR ARMY FOR THE FUTURE."

In the past year, we made progress in cross-leveling to fill shortages and eliminating obsolete and no longer required equipment. This year, based on guidance from the Chief of Staff of the Army, we need to greatly accelerate the process. As a result, my team hosted a Rehearsal of Concept (ROC) Drill in the fall with commands throughout the Army, including U.S. Army Materiel Command (AMC), Assistant Secretary of the Army (Acquisition, Logistics and Technology (ASA(ALT)) and Defense Logistics Agency (DLA), to map out an All Army Excess Campaign Plan.

Similar to units' "clean sweeps," the end state is to: redistribute excess equipment to fill other commands' shortages; remove the materiel no longer required so we do not spend precious time and limited funding on obsolete equipment; and preserve time for units to train and focus on readiness. In addition, AMC will be actively divesting excess materiel at its depots to reduce overall Army costs.

At the ROC Drill, the team came up with practical policies and procedures to streamline the turn-in process to make it easier for units. The commands identified the amount and categories of equipment they could practically divest based on available resources. Equipment going to another Army Command or depot will be turned in to either the Logistics Readiness Centers (LRCs), or DLA. The funding for transportation for these actions will be centrally managed by AMC's Army Sustainment Command. In order to get to a steady state, the G-4 Logistics Innovation Agency will review the policies, regulations and procedures to institutionalize the Army's best practices going forward.

This entire effort will not be easy. There is hard work ahead of us, but it is setting up our Army for the future. Our teaming effort with DLA and the LRCs will also allow us to cross-level and divest of much more equipment than we have in the past. We need commanders and sergeants major across the formation to be involved and track this effort; otherwise it is not going to happen. Leaders must take an active role to make this happen!

I am confident that with the support of Army Commands, Army Service Component Commands and Direct Reporting Units, we will ensure success, improve Army readiness, and contribute to the Army's ability to generate and apply combat power.

AMC BY THE NUMB3RS

75% of the Army's Science and Technology (S&T) investment executed within AMC

38,000+ youth participated in Army science, technology, engineering and mathematics (STEM) activities in 2015

24 countries have international Research and Development (R&D) relationships with AMC

63,900 dedicated AMC employees worldwide

7,134 mechanics, electricians and machinists

For **50+ years**, the U.S. Army has provided STEM support activities

50 states with an AMC presence or impact

12,217 scientists and engineers

$1.6 billion in R&D in FY15

$6.5 billion invested annually by AMC in Army S&T

AMC LEADS THE WAY IN SUSTAINING THE FUTURE FORCE

By Elizabeth Behring, AMC Public Affairs

The U.S. Army Materiel Command (AMC) is laser-focused on supporting the Chief of Staff of the Army's priorities, assuring sustainable readiness, developing and fielding capabilities to defeat adversaries, and building and training the workforce of the future, said Army Materiel Command Commander Gen. Gus Perna.

In an increasingly complex and dynamic global environment, developing and equipping a future force ready and prepared to defeat any adversary on any battlefield is critical. AMC – the Army Command that equips and sustains Soldiers – remains the preeminent leader in providing for the future force.

"The Army's responsibility to the American public is to continue to be one step ahead when it comes to preparing our force," Perna said. "With new missions throughout the world every day, Army Materiel Command stands ready to support Army priorities and operations and equip the warfighter wherever and whenever needed. We are consistently increasing our presence and capability in places we didn't think we were going to be."

For AMC, building an agile, adaptive Army for the future includes two distinct endeavors: a trained and educated future workforce, and modernized, advanced equipment for the warfighter.

MAIN IMAGE: Soldiers assigned to 3rd Brigade Combat Team, 1st Cavalry Division, maneuver their M1A2 Abrams tank to avoid indirect fire during training at the National Training Center at Fort Irwin, California. AMC is working to modernize key elements of the Army's ground combat vehicles such as the Abrams tank for the Soldier of tomorrow. (U.S. Army photo by Spc. Dedrick Johnson)

LEFT TO RIGHT: Researcher Kate Laflin uses a microscope to examine a wafer in the Photo Lithography Laboratory at the U.S. Army Research Laboratory at Aberdeen Proving Ground, Maryland. (U.S. Army photo by Doug LaFon)

Chester Cunningham, an assembler at Watervliet Arsenal in New York, takes the burs off of a 120 mm tank tube. After the majority of machining has been completed, assemblers grind down the burs on threading to ensure fit, form and function. On this tube, there are three sets of threads and the process takes up to four hours per tube. (U.S. Army photo by Sgt. 1st Class Michael Zuk)

Quality Assurance Inspector Eric Beeles prepares a howitzer tube for non-destructive testing using electronic magnetic-particle inspection to check for subsurface discontinuity at Watervliet Arsenal in New York. This inspection process takes up to three hours per tube and is performed at the arsenal on hundreds of tank and artillery tubes each year. (U.S. Army photo by Sgt. 1st Class Michael Zuk)

WORKFORCE

AMC relies on the hard work and dedication of around 64,000 Soldiers and Department of the Army Civilians to meet its mission of providing for the force. The largest employer of Army civilians, AMC's workforce includes highly skilled and uniquely qualified professionals from logisticians to contracting officers, industrial artisans to scientists.

"Simply put, we cannot meet the Chief of Staff of the Army's guidance without relying on the hard work and dedication of Army Materiel Command's workforce," said Perna. "Our personnel truly are the backbone of the command."

To develop the next generation of professionals and leaders, AMC offers training programs, broadening assignments and other initiatives for its workforce.

Recognizing the need for its logisticians to train alongside industry and stay current with trends in the field, AMC encourages its leaders to participate in one of multiple training programs. AMC is the DOD executive agent for the Center of Excellence in Logistics and Technology (LOGTECH) program and the Depot and Arsenal Executive Leadership Program. Coupled with courses provided by Defense Acquisition University and other Army-provided training, these executive development programs both train professionals on the business behind AMC logistics and operations, and the tenets of good leadership.

AMC also partners with various universities and research institutions across the world to train and develop the workforce. Leadership across the command encourages developmental assignments within AMC and outside of the organization to broaden skills and perspective.

The programs are not just for mid-level or senior workers, Soldiers or civilians. As the Army's workforce approaches retirement age, AMC has planned several steps ahead to continue to cultivate, man, train and equip the future force in the form of a robust intern program. AMC's intern program provides current high school or college students and new college graduates opportunities to apprentice for the federal government in one of various professions across the enterprise.

AMC's robust wellness program focuses on the workforce's resilience, offering classes and programs on health, finances and more. Taking care of people now will reap great dividends in the future, when those employees become the next commanders, supervisors and members of the Senior Executive Service, said Perna.

"There is unlimited talent and energy in our ranks, and these programs and initiatives demonstrate our care and commitment to their success," he said.

LEFT: Spc. Adam Walton, AMC's 2015 Soldier of the Year, reassembles a M240 machine gun in Anniston Army Depot's Small Arms Repair Facility in Alabama. The U.S. Army's ammunition plants, depots and arsenals provide the capability to surge in support of global contingencies today and into the future. (U.S. Army photo by Jennifer Bacchus)

RIGHT: An industrial equipment operator uses a crane to hoist the hull of a M1 Abrams tank into a spinner hanger at Anniston Army Depot. (U.S. Army photo)

FAR RIGHT: AMC relies on the dedication of its 64,000 Soldiers and Department of Army Civilians, such as Sandra Gomez, the technical director for the RDECOM International Technology Center in France. (U.S. Army photo by Erin Usawicz)

Explosives Handler Jayne McIntosh stages 105 mm tank training cartridges for breakdown as part of a pull-apart demilitarization process at Crane Army Ammunition Activity in Indiana. (U.S. Army photo by Sgt. 1st Class Michael Zuk)

EQUIPMENT

Through a robust science and technology enterprise and comprehensive life cycle management commands, AMC develops, delivers and sustains the most current, modernized materiel possible for today's warfighter and the future force.

Managing more than 75 percent of the Army's annual investment in science and technology, AMC's network of research centers and laboratories are hard at work developing next-generation technologies to maintain overmatch against adversaries.

AMC is synchronizing and aligning science and technology investments to the Army's priorities and Soldier needs to increase lethality, survivability, mobility and network functionality, said Perna.

"We are focused on the requirements on the battlefield," he said. "We have the greatest logistics corps in the world; however, if we can figure out how to lighten our loads and our requirements, we can be even better. Those two lines of effort enable us to design the future of our Army."

From improved helmet protection to increased munitions precision, AMC scientists and engineers are designing and prototyping the equipment of the future. But with continued budget constraints, the Army is also maximizing the capabilities of its current equipment, providing upgrades and modernization across portfolios.

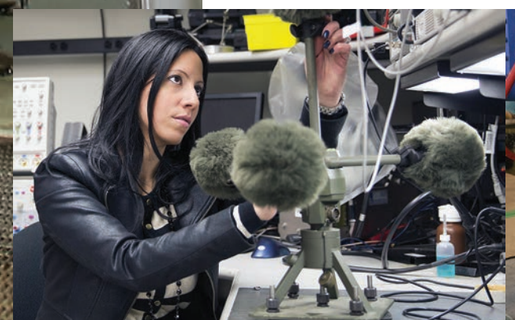
Modernization efforts across the force include upgrades to the current fleet of Black Hawk helicopters with digitized cockpits to match newer safety protocol. Upgrades to the fleet of Abrams and Stryker vehicles are in the works to increase lethality through a Mobile Protected Firepower platform. Across the network, the Army is focused on modernizing and consolidating legacy communications to create a more secure, integrated and standards-based network.

Systems upgrades and new platforms are also leading the way to the future for the Army. Global Combat Service Support-Army (GCSS-Army) replaces several legacy systems, providing an integrated solution to accountable consolidated enterprise resource planning.

"GCSS-Army is a huge success and a game-changer in the logistics force," Perna said. "The system will produce more timely, precise and effective information needed by the warfighter in order to move, track, maintain and account for equipment and supplies. The positive impact from this system resulting from the creation of data-driven supply, maintenance and property management is unheard of in today's Army."

AMC's innovation efforts keep the command on a constant cycle to develop and implement the newest, best and brightest, whether equipment or people.

"I am convinced that if we focus our efforts and capabilities on the warfighter needs and the force of the future, and we hold ourselves accountable while working as part of the greater Army team – the total Army team – there will be no mission that we cannot accomplish," Perna said.



Future Soldier Equipment

By NSRDEC Public Affairs

The U.S. Army's single most important piece of equipment does not come from a lab or a factory; the greatest weapon the Army deploys is the Soldier, and the Natick Soldier Research, Development and Engineering Center (NSRDEC) in Massachusetts is focused on developing capabilities that increase warfighter capacity to fight and win on the future battlefield.

To achieve decisive overmatch capabilities, Soldier and squad performance is enhanced by technologies that empower, unburden and protect troops while increasing quality of life. NSRDEC is working toward this goal in concert with a number of critical strategic partners, including Program Executive Office (PEO) Soldier. NSRDEC leads a collaborative effort across the military research and development community while partnering with the Army medical, acquisition and Science and Technology (S&T) communities, and researchers in academia focusing on both physical and cognitive performance. These efforts provide the Army with innovative S&T solutions to optimize Soldier and team performance and improve combat readiness.

"PEO Soldier is always looking for ways to increase Soldiers' capabilities with current and future gear, and to reduce Soldier load," said Brig. Gen. Brian P. Cummings, Program Executive Officer Soldier. "We share that information with our partners, such as Natick, to ensure Soldiers get the best equipment possible."

NSRDEC, part of the U.S. Army Research, Development, and Engineering Command (RDECOM), is an active component of both RDECOM's Army Soldier and Squad Performance Optimization S&T Strategy and the Army Human Dimension Strategy. It leads the Soldier-focused research in supporting the Army Training and Doctrine Command Force 2025 and Beyond guidance.

Scientists and researchers at NSRDEC explore Soldier and squad performance based on prior and current work in the areas of nutrition, biomechanics, injury prevention, cognitive science, human factors and human dimensions research. NSRDEC also studies Soldier and squad technology integration and anthropology, combined with Soldier systems engineering architecture and systems integration.

The importance of human performance optimization is crucial to both the Army's current and future operations.

"This collaborative effort on the part of the Army S&T community is critical to the future of the Army and will have a tremendous impact not only on the Soldier of today, but also on the Soldier of 2025 and beyond," said Douglas Tamilio, NSRDEC director.

In accordance with the Army Human Dimension Strategy, the Army can only maintain the decisive edge in the human dimension – cognitive, physical and social components – through investment in its human capital. With this investment, the Army is capable of developing cohesive teams of trusted professionals who improve and thrive in the ambiguity and chaos of future conflicts, Tamilio said.

However, the Soldiers of tomorrow also need advanced technologies to augment their optimized human performance.

Recently, NSRDEC teamed with Tufts University School of Engineering to create the Center for Applied Brain and Cognitive Sciences to examine four specific areas, including the principles that govern interactions between people and devices such as smart phones, head-mounted displays and tablets, and autonomous robotic platforms aimed at augmenting and optimizing human cognition, mood and physical capabilities. Other research will focus on the effects of frustration, mental workload, stress, fear and fatigue on both cognitive and physical performance. Research continues on the effect of load and physical fatigue on cognitive performance and applying cognitive science findings related to interaction, communication and cohesiveness among Soldiers and squads.

NSRDEC is also researching the effects of nutrition on Soldier performance. Working with the Uniformed Services University of the Health Sciences' Human Performance Resource Center and the Army Research Institute of Environmental Medicine, NSRDEC's Combat Feeding Directorate is looking at the role nutrition plays in Soldier performance and how it can augment the current nutritional components of combat rations with naturally occurring performance optimization compounds to help prevent injury, lessen muscle fatigue, reduce injury recovery time and provide mental alertness.

NSRDEC's virtual reality dome enables researchers to assess the impact of the environment on Soldier cognition, including decision-making, spatial memory or wayfinding. Researchers will also be able to assess the impact of new equipment on cognitive abilities. (U.S. Army photo by David Kamm)

Through 3-D food printing, researchers are attempting to provide individual nutritionally tailored meals to Soldiers in the field based on requirements possibly transmitted through vital sign monitoring devices embedded in their uniforms or equipment.

NSRDEC is also looking into other Soldier-borne sensor concepts that will provide information about friendly and enemy forces, civilians on the battlefield, and actual and potential threats in the area of operations using smartphone technologies, augmented reality, ground and aerial intelligence, surveillance and reconnaissance platforms.

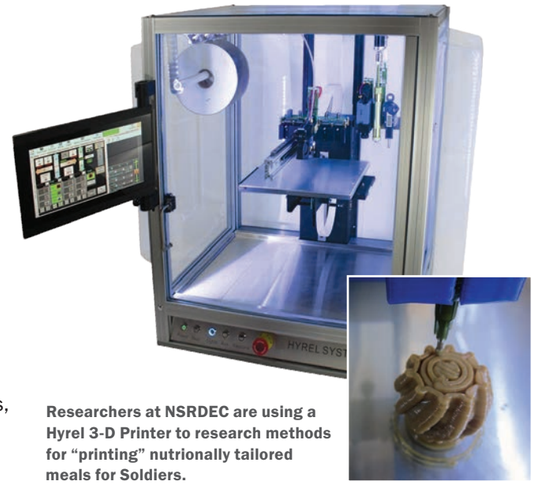
NSRDEC continues its research into flame-resistant, bullet/blast-resistant and smart textiles, high-performance fibers and wearable power, and is now aided by the Secretary of Defense's recent announcement of the formation of the Revolutionary Fibers and Textiles Manufacturing Innovation Institute, a $75 million Department of Defense investment in advanced manufacturing.

Other areas of research to optimize Soldier and squad performance focus on human/machine teaming to enable missions and the capabilities of autonomous resupply to unburden the Soldier. Additionally, to reduce reliance on batteries and provide alternative power sources in the field, NSRDEC is conducting research into different types of wearable solar power capabilities and energy-harvesting devices.

To deploy Soldiers and force projection platforms around the world into any environment, research into aerial delivery technologies is adapting current GPS-guided cargo parachute systems to use autonomous visual navigation systems for areas where GPS is unavailable or blocked by terrain or man-made structures.

NSRDEC researchers are also working on adaptive vision protection technologies that enable a Soldier's eye protection to instantaneously change based on lighting conditions while also preventing injury from lasers and blast debris.

Working with Product Manager Force Sustainment Systems, a Base Camp Integration Lab was created to explore expeditionary basing concepts to improve quality of life, and reduce logistical requirements, fuel and water consumption, and base camp solid and liquid waste.

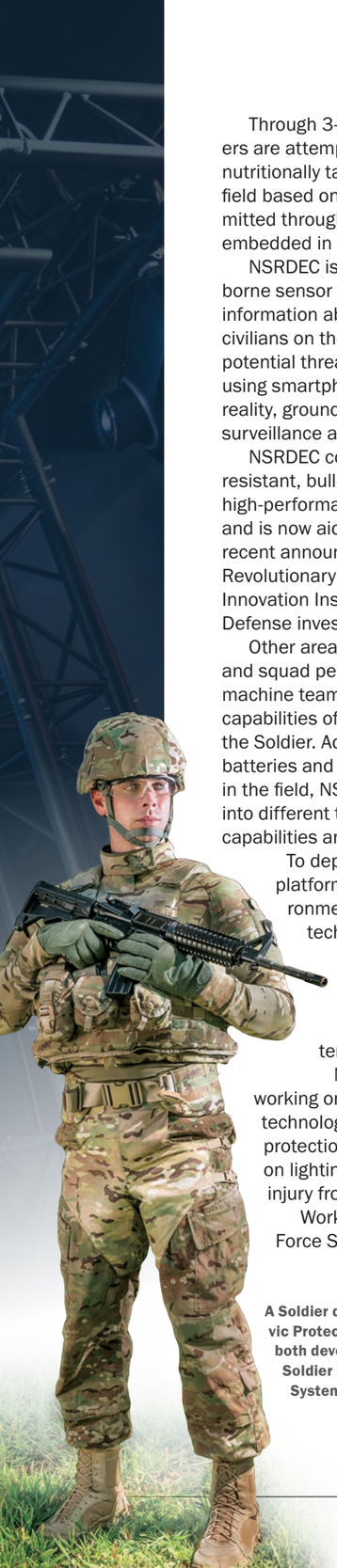


Researchers at NSRDEC are using a Hyrel 3-D Printer to research methods for "printing" nutrionally tailored meals for Soldiers.

The Harnessing Emerging Research Opportunities to Empower Soldiers, or HEROES, program – a collaborative NSRDEC and University of Massachusetts-Lowell effort – has produced advanced nanotechnologies including super omniphobic coatings and materials that repel solids, gels and a range of liquids including toxic industrial chemicals and chemical warfare agents. Other advanced material research may lead to autonomous self-decontaminating protective uniforms.

In the Army S&T community, NSRDEC's research and development efforts must contribute to readiness today, tomorrow and in the future, as well as provide overmatch capabilities by developing and adapting technologies to empower, unburden and protect Soldiers across the full spectrum of operations. Along with its partners, NSRDEC will ensure dominance through superior scientific and engineering expertise, Tamilio said.

No one can predict where or when future battles will take place, or what adversary Soldiers will face, but NSRDEC and the Army's S&T community is prepared to provide the capabilities to have decisive overmatch in any situation.



A Soldier demonstrates the new Blast Pelvic Protector and Ballistic Combat Shirt, both developed by NSRDEC and PEO Soldier as part of the Soldier Protection System. (U.S. Army photos)

The U.S. Army Research, Development and Engineering Command (RDECOM) has the mission to ensure decisive overmatch for unified land operations to empower the Army, joint warfighter and nation. RDECOM is a major subordinate command of the U.S. Army Materiel Command.

ARMY CIVILIANS PROVIDE DIRECT SUPPORT TO THE WARFIGHTER DOWNRANGE

By Justin Graff, 401st Army Field Support Brigade

Since the beginning of Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF) nearly 16 years ago, the American people have watched Soldiers on television represent America through combat and humanitarian assistance overseas. While the Soldiers do the fighting on the front lines, an important network of support behind them provides essential logistic and administrative expertise. Army civilians have been, and are currently, deployed to locations across the Middle East and Southwest Asia to directly support the warfighter.

The 401st Army Field Support Brigade (AFSB), located at Camp Arifjan, Kuwait, has more civilians deployed throughout the U.S. Central Command (CENTCOM) footprint than Soldiers. The brigade serves as U.S. Army Materiel Command's face to the field. It's an essential link to the Army materiel enterprise, providing logistics, acquisition, maintenance and retrograde support to ground units across the CENTCOM area of operations.

Civilians are extremely valuable in a fast-paced and ever-changing environment, said the brigade's deputy commander and top civilian Bob Williams.

"The obvious advantages are that the civilians, most of whom are veterans, tend to have more experience," Williams said. "These civilian employees are familiar with the processes and procedures resident in their areas of responsibility and know the challenges they will encounter and how to successfully address them."

Most of the civilians who are deployed with the 401st AFSB volunteered to do so. The brigade follows a specific procedure to hire, screen and select applicants for the positions.

"Due to the short duration most DA Civilians spend here in the 401st, it is imperative that each individual comes to the position fully trained and ready to assume the responsibilities of the position they will fill," Williams said. "We need each employee – civilian or military – to be able to immediately grasp the urgency and seriousness of the mission and to be prepared professionally, mentally and physically to contribute to the mission support effort."

Upon being selected, candidates receive a tentative job offer. After an offer is accepted, the employee must pass a pre-deployment physical, complete required paperwork and establish a date to go to the Civilian Replacement Center (CRC) at Fort Bliss, Texas, to participate in a week-long process of training, as well as financial and administrative planning.

"Lately the biggest challenge has been getting new employees to successfully pass the deployment physical," Williams said.

Soldiers with the 77th Armored Regiment, 3rd Brigade, 1st Armored Division, ruck toward their convoy to participate in the squad live-fire exercise at Udari Range near Camp Buehring, Kuwait. The 401st Army Field Support Brigade, located at Camp Arifjan, Kuwait, helps sustain Soldiers throughout the Middle East as the Army Materiel Command's face to the field. (U.S. Army photo by Sgt. Angela Lorden)

In Kuwait, specifically, the 401st AFSB has experienced challenges in hiring civilians, largely due to the reduction of financial incentives over the last few years and compounded by tighter health standards at CRC.

Williams has been a part of the 401st AFSB since its inception, and has deployed in support of its mission three times throughout the last 10 years.

"The most important factor to me is getting an employee whose primary interest is in providing quality support to the Soldier," Williams said. "Civilians who have the knowledge, skills and abilities we are looking for in our employees are capable of finding work anywhere, but they choose to come here – to accept the hardships, restrictions and challenges of these positions because they believe that there is no job more important than ensuring America's Soldiers have everything they need for the job they're doing in this theater of operations."

Several of the civilians working for the 401st AFSB are serving on their third or fourth tour. Many of them opt to extend their deployments by a year or more.

A LIFE DEPLOYED: STEPHANIE BAYNES

Stephanie Baynes, operations research and systems analyst, 401st AFSB-Afghanistan, is approaching the end of her six-month deployment to Bagram Airfield, Afghanistan.

Baynes deployed from Aberdeen Proving Ground, Maryland, where she works as a computer scientist for Army Materiel Systems Analysis Activity.

"The reason I wanted to deploy was I kind of wanted a little bit of adventure," Baynes said. "I've been working for the Department of Defense, specifically Army, for eight years. I knew that deployment was a possible opportunity, and I felt like I could do my job better supporting the warfighter if I had this experience. I wanted to serve my country, of course."

Baynes is responsible for collecting and analyzing data which can be produced into actionable information for the support operations officer.

"We take in data regarding readiness rates across Afghanistan," she said. "For all of our rolling stock – all of our MRAPs (Mine-Resistant Ambush Protected vehicles) and similar items that the 401st takes care of, at all the outlying forward operating bases, we have to maintain a 90 percent readiness rate across the board."

Her only regret, she said, is not deploying for a longer tour.

"There are a lot of things I'm going to miss," said Baynes. "First of all, the people are awesome. Everyone becomes united working toward the same thing every day. We're all over here away from our families and people that we love, so you just kind of bond together."

A LIFE DEPLOYED: LEALOFI FAIAI

Lealofi Faiai, deputy commanding officer (DCO) of the 401st Army Field Support Battalion (AFSBn) in Afghanistan, is serving a 13-month tour after completing two years at 401st AFSBn-Qatar. Faiai deployed from Fort Hood, Texas, where he works as a logistician for the 407th AFSB.

"As the DCO, I'm responsible to make sure Soldiers and civilians are taken care of," Faiai said. "I want to make sure they have whatever they need, and I take care of a lot of the administrative things that keep the unit running."

Faiai enlisted in the Army in 1988 and retired in 2008 after 20 years of active duty service, including four tours in Iraq in support of OIF.

"When I first retired, I told myself I'd never return to the war zone," he said. "What changed is I still have brothers and sisters downrange. I'm proud to support the warfighter. I was one, and 'once a Soldier, always a Soldier.' It's hard to work for the Army every day and sit on the sideline and not be part of the fight, and that's why I'm here."

Stephanie Baynes, operations research and systems analyst, 401st Army Field Support Battalion-Afghanistan, serves on her first deployment to Bagram Airfield, Afghanistan. Baynes deployed from Aberdeen Proving Ground, Maryland, where she works as a computer scientist for Army Materiel Systems Analysis Activity.

The civilian-heavy environment within the 401st AFSB can be a challenge for Faiai, he said.

"A lot of times, Soldiers aren't used to working so closely with so many civilians," he said. "The challenge for me as the DCO is to mentor both sides and bridge that gap."

A LIFE DEPLOYED: AARON ANDERSON

Aaron Anderson, quality assurance specialist, 401st AFSBn-Afghanistan, is an Army veteran currently serving a 13-month deployment at Bagram Airfield. As a Soldier, he deployed in support of Operation Desert Shield, Operation Desert Storm, Bosnia-Herzegovina, OIF and OEF as a wheeled vehicle mechanic.

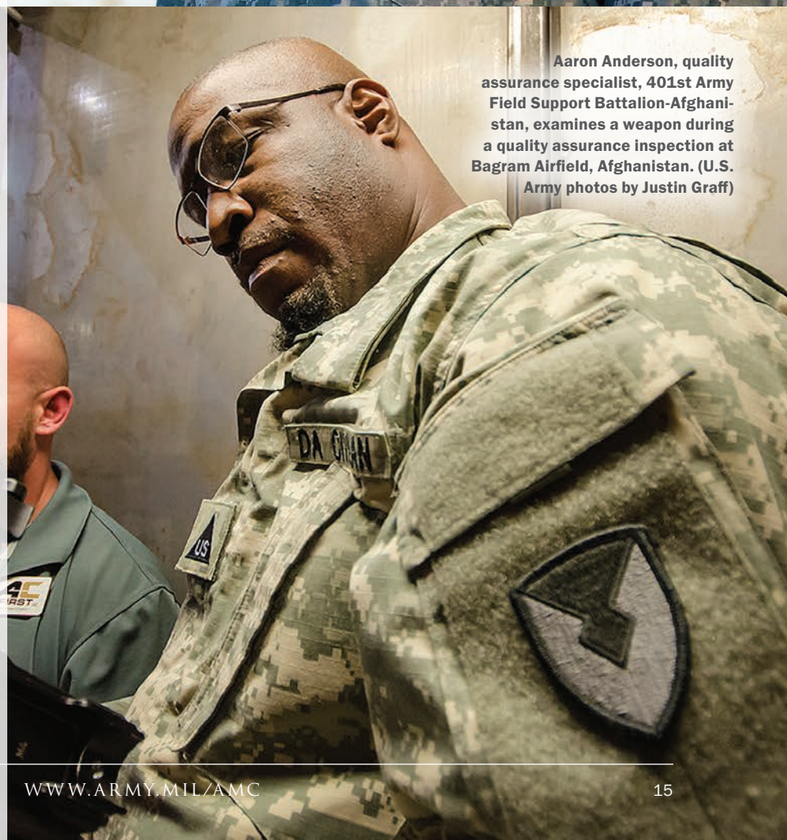
"My favorite part is being that friendly face to the field," Anderson said. "As the 401st, when we see Soldiers and we see they have a need, it's always gratifying to be able to support that warfighter. You get to put the uniform back on, and that makes a person proud that they are serving as a part of a team. We're here alongside the military personnel."

Anderson deployed from Forest, Mississippi, where he works for Defense Contract Management Agency.

"Our primary mission here is to support the warfighter," Anderson said. "We get up early, and we lay down late. We make sure that, in the end, when we go to bed at night we can look back over our day and say, 'Well done. Because of what we did today, the warfighter has what they need to be better than our enemies.'"

The 401st Army Field Support Brigade falls under U.S. Army Sustainment Command (ASC). ASC, a subordinate organization of U.S. Army Materiel Command, is the command and control hub for global Army logistics, supporting Combatant Commanders and the Logistics Civil Augmentation Program. The command bridges the national sustainment base to the Soldiers in the field, bringing together the capabilities of AMC to provide the right equipment, at the right place and time, and in the right condition.

Lealofi Faiai, the deputy commander of the 401st Army Field Support Battalion-Afghanistan, deployed from Fort Hood, Texas, where he works as a logistician for the 407th AFSB.



Aaron Anderson, quality assurance specialist, 401st Army Field Support Battalion-Afghanistan, examines a weapon during a quality assurance inspection at Bagram Airfield, Afghanistan. (U.S. Army photos by Justin Graff)

AMC NEWS & NOTES

1 Gen. Perna takes command of AMC

The U.S. Army Materiel Command (AMC) welcomed its new senior leader, Gen. Gus Perna, during a Sept. 30, 2016, change of command ceremony hosted by the 39th Chief of Staff of the Army Gen. Mark A. Milley at AMC headquarters at Redstone Arsenal, Alabama. Perna, who previously served as AMC's deputy chief of staff for logistics and operations, returns to AMC after serving two years as the Army's deputy chief of staff, G-4. "I am convinced that if we focus our efforts and capabilities on what is important, and we hold ourselves accountable while working as part of the greater Army team – the total Army team – there will be no mission that we cannot accomplish," said Perna.

2 Foreign Military Sales equipment supports Olympics

Black Hawk helicopters acquired through Foreign Military Sales (FMS) provided aerial surveillance over Rio de Janeiro during the 2016 Summer Olympics. The Black Hawks were some of the 16 provided to Brazil between 2010 and 2012 as part of the U.S. Army Security Assistance Command (USASAC) FMS program. The UH-60L helicopter FMS case aided the South American country in modernizing its aviation fleet. "Brazil is one of the largest economies in the world and has supported such recent events as the World Cup in 2014 and the 2016 Olympics," said Michael Kyle Crawford, USASAC's Brazil country program manager. Brazil's civil use of the Black Hawk shows the far-reaching impact of Army FMS. "The use of the UH-60L to support a global event like the Olympics shows that our efforts at USASAC have global implications," Crawford said.

3 Expeditionary Contracting Command welcomes new leader

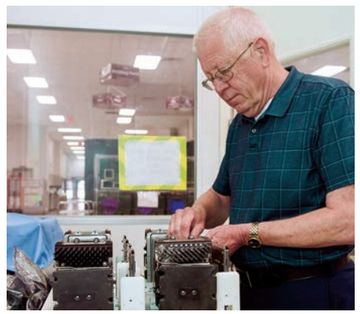
Brig. Gen. Paul Pardew assumed command of the U.S. Army Expeditionary Contracting Command (ECC), a subordinate to the U.S. Army Contracting Command, during a ceremony at Redstone Arsenal in October 2016. Pardew, a former ECC chief of staff, took command from Brig. Gen. Michael Hoskin. "You can expect nothing more than my complete passion and dedication to our nation, the Army, our mission and our people," said Pardew.

4 Mobile application leads to innovation award

The MILES Laser Tag Utility is a mobile application that provides battle simulation technicians with an improved method to test, configure, maintain and troubleshoot equipment within the Multiple Integrated Laser Engagement System. The training system provides Soldiers the capability to engage in simulated operations in a realistic battlefield environment. The app was developed by Capt. Lawrence Collins at the U.S. Army Corps of Engineers Mississippi Valley Division. Collins was presented the 2015 Maj. Gen. Harold J. Greene Award for Innovation for individual military during a ceremony Sept. 8, 2016, for his ingenuity. The Maj. Gen. Harold J. Greene Award for Innovation is presented under the Army's Greatest Innovation Awards Program to Army Soldiers and civilians whose technological and business process improvements benefit the Soldier. For more information, visit the Army's Greatest Innovation Award Program website at http://www.amc.army.mil/amc/agiap.html.

5 Tobyhanna innovation saves $12 million

Dr. Clinton Holder, an electronics engineer in the Tobyhanna Army Depot Production Engineering Directorate in Pennsylvania, designed a test set that will evaluate the detector/cooler bench, a major component of the Long Range Advance Scout Surveillance System, for faults and failures. The innovative solution will save the depot more than $12 million over the next three years, exceeding Tobyhanna's value engineering savings goals while also improving component-level reliability within various systems.



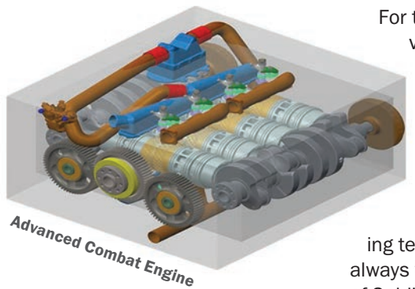
6 SDDC supports hurricane recovery efforts in Haiti

Twenty personnel from the Military Surface Deployment and Distribution Command deployed to Port-au-Prince, Haiti, Oct. 7-11, 2016, in support of Hurricane Matthew recovery efforts. The team worked as part of a joint task force assessing the damage to seaports and airfields in and around Port-Au-Prince. "It would be far more difficult to bring in aid without AMC's presence on the ground," said Danny Bordeaux, AMC chief of operations. AMC officials ensured ports and airfields were safe and secure prior to aid arriving from around the world. The support was requested by the U.S. Southern Command. "AMC is doing nothing more than what it does in any typical worldwide operation from combat to humanitarian relief," said Bordeaux. "We are prepared for these things every day."

(U.S. Army photos)

DRIVING THE ARMY'S ENERGY-EFFICIENT FUTURE

By Jerome Aliotta, TARDEC Public Affairs



Advanced Combat Engine

TOP: A Heavy Expanded Mobility Tactical Truck A4, one of the vehicles U.S. Army Tank Automotive Research, Development and Engineering Center researchers plan to use to demonstrate the Tactical Vehicle Electrification Kit, drives over rough terrain. (Photo courtesy of Oshkosh Defense)

For the U.S. Army, owner and operator of the world's largest fleet of ground vehicles, the pursuit of energy efficiency programs that strengthen the military while meeting environmental challenges is highly important.

Outside of reducing reliance on fossil fuels, energy efficiency reduces the risk of insurgent attacks on Soldiers during refueling convoys, as a mere 1 percent increase in fuel efficiency means 6,444 fewer Soldier trips in convoys.

The challenge in reducing vehicle fuel consumption is that few solutions exist that do not involve expensive retrofitting. Fuel-reducing technologies, such as light weighting or improved aerodynamics, are not always viable options, because they could compromise the lethality or the safety of Soldiers occupying the vehicles. To support Army goals, the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) has been investing in energy efficient technology for more than two decades.

ADVANCED COMBAT ENGINE

TARDEC is working to develop and demonstrate leap-ahead engine technology to meet the mobility and electrical power generation needs of future combat and tactical military vehicles in the 30-70 ton range. The prototype Advanced Combat Engine (ACE) will be a 4-cylinder, opposed-piston engine rated at 1,000 horsepower with 15 percent greater fuel economy and a lower thermal burden compared to commercially available engines of similar power and torque levels.

"The results of the ACE engine utilizing an opposed-piston design architecture will provide significant improvement in thermodynamic efficiency over commercial-off-the-shelf engines while increasing power density, improving vehicle mobility, and reducing fuel consumption and thermal burden," said John Tasdemir, TARDEC powertrain team leader.

Commercial engine manufacturers have no real incentives to develop and produce high-power density, low-heat rejection engine concepts in the 750 to 1,500 horsepower range for military use, Tasdemir said. This is primarily due to projected low-production volumes and lack of technology insertion into their high-volume emission-compliant engine product lines.

"The ACE project will advance the state-of-the-art in engine technology and provide the building blocks necessary for creation of a scalable engine family to meet power and mobility needs across the future combat fleet," he said.

JOINT OPERATIONAL ENERGY INITIATIVE

Numerous Army initiatives seek improvements for operational energy, including the Joint Operational Energy Initiative (JOEI) sponsored by TARDEC and Program Executive Office Combat Support and Combat Service Support.

"The objective of JOEI is to develop, demonstrate and document a modeling and simulation toolset and methodology to analyze operational energy using an integrated, system-of-systems engineering approach that enables comprehensive energy decision-making throughout the materiel development process," said Brian Ernst, TARDEC operational energy lead.

JOEI models energy consumption and generation across the battlefield area of operations. The program uses a modeling and simulation tool developed by the Department of Energy's Sandia National Laboratories called System-of-Systems Analysis Toolset (SoSAT).

Using SoSAT, TARDEC developed a capability to assess impacts of technologies in a multilevel virtual scenario.

"The JOEI team goal is to develop a library of scenarios and models made up of maneuver forces, logistics support and contingency bases, and to assess second- and third-order impacts to energy efficiency, operational effectiveness, operational adaptability and Soldier impacts," said Rachel Agusti, TARDEC lead system engineer.

In Fiscal Year 2016, the JOEI team acquired the Fully Burdened Cost Tool (FBCT), a new analysis tool to estimate the fully burdened costs and benefits of energy and water in an operational scenario.

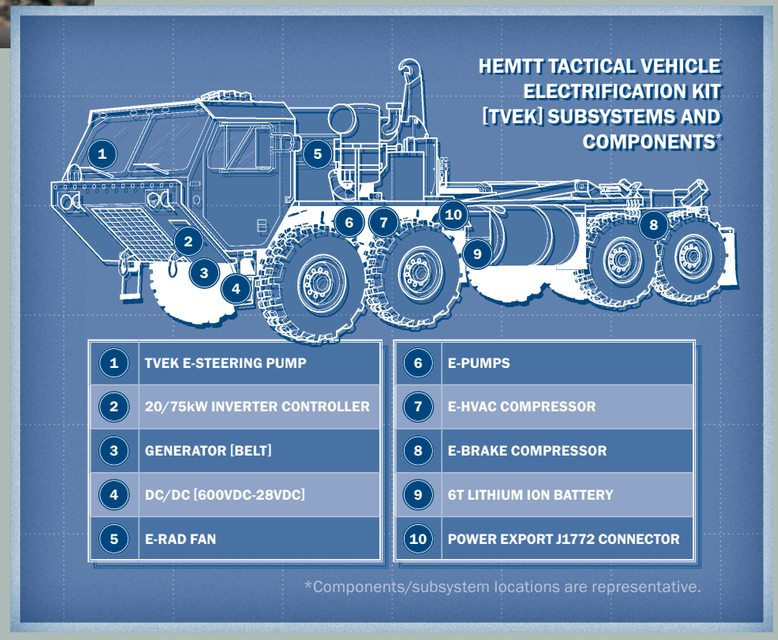
"With the addition of the FBCT, the JOEI team can provide quantitative evidence to evaluate materiel and non-materiel solutions, inform trade studies, conduct cost-benefit analysis, inform current and future doctrine, and inform science, technology and current operations," Agusti said.

TACTICAL VEHICLE ELECTRIFICATION KIT

During the next year, TARDEC engineers will be working on improving fuel economy for the current tactical ground vehicle fleet. An affordable, truck-auxiliary system electrification kit will integrate on one or more existing tactical wheeled vehicle platforms. The goal is to significantly improve vehicle operational energy, range and future electrical warfighting system growth potential.

"Our Tactical Vehicle Electrification Kit (TVEK) program has the potential to create a 15 to 25 percent reduction in fuel usage, improve vehicle mobility performance, enhance silent watch capability, provide a shore-power connection for export power capability, and possess the future electrical capability to support large electrical loads," said Phat Truong, TARDEC project lead.

TARDEC engineers plan to demonstrate the kit on an



Oshkosh Defense-built Army Heavy Expanded Mobility Tactical Truck and the Marines' Logistics Vehicle System Replacement. Components may include: an integrated starter generator (ISG), ISG controller, LI-Ion 6T batteries, electrified steering, electrified HVAC, electrified engine cooling, electrified pumps, electrified air brake compressors, solid state low voltage supply (DCDC Converter), and a shore-power connection.

"The intent of the program is to develop capabilities for the warfighters, while the electrification kit must also be lightweight, robust, compact and affordable," said Dean

TARDEC's axle efficiency test stand is used in the development of Fuel Efficient Gear Oil. (U.S. Army photo)

McGrew, TARDEC advanced propulsion team leader.

The TVEK project will focus on improving the current heavy tactical vehicle fleet's effectiveness and efficiency through intelligent start-stop strategy, auxiliary system electrification and smart system controls, Truong said. TVEK will demonstrate 15 to 25 percent fuel use reduction by the end of FY19. The project will also show capability to support future electrical needs for jamming, communications, e-weapons and e-armor.

SINGLE COMMON POWERTRAIN LUBRICANT

Replacing standard lubricants with alternative lubricants that reduce fuel consumption is one practical and relatively inexpensive way to improve fleet fuel efficiency. In order to reduce the fuel consumption of its vehicle fleet and lessen its maintenance burden, TARDEC's Fuels and Lubricants Technology team developed a new full synthetic, all-season, fuel-efficient, heavy-duty engine oil called the Single Common Powertrain Lubricant (SCPL).

"The initial feasibility was established through successful engine dynamometer testing of MIL-PRF-46167 arctic engine oil under high-temperature desert-like conditions in three high-density military engines," said Allen Comfort, TARDEC engineer.

SCPL candidates underwent field evaluations at three separate geographic locations that represent hot, moderate and arctic climatic conditions – Fort Bliss, Texas; Fort Benning, Georgia; and Fort Wainwright, Alaska. Various tactical and combat vehicles were involved in the evaluation, which included engines from several original equipment manufacturers.

FUEL EFFICIENT GEAR OIL

TARDEC is also developing a new axle differential gear oil called the Fuel Efficient Gear Oil (FEGO). The project consolidates the current three grades of gear oil (80W-90, 75W-90 and 85W-140) into a single oil. FEGO will be an all-season gear oil capable of doubling oil drain intervals and improving fuel efficiency.

FEGO, which is expected to be available in the field by late 2020, will be compatible with limited-slip differential systems. These differentials are used in the Stryker Combat Vehicles, for example.

"Unlike conventional open differentials, limited-slip differentials ensure vehicles can move even if one side of the vehicle is on a low-friction surface such as ice," said Joshua Peterson, TARDEC deputy associate director. "Limited-slip differentials often employ a clutch system, which requires special friction modifiers to ensure the clutch plates operate smoothly during normal turning maneuvers without causing destructive vibration or shudder."

New requirements for the FEGO, including better fuel efficiency, longer drain intervals, and limited-slip capability will be integrated into the commercial gear oil standard, Peterson said.

"Full vehicle testing showed that the combined use of SCPL in the engine and transmission and FEGO in the differentials resulted in a 6.1 percent and 7.8 percent fuel consumption improvement, respectively, over baseline lubricants, in a highway and a stop-and-go cycle," Peterson said. "Such results, applied over a large variety of military combat and tactical equipment, represent significant fuel savings and reduction in logistical burden."

U.S. Army Tank Automotive Research, Development and Engineering Center is a part of U.S. Army Research, Development and Engineering Command and works closely with U.S. Army Tank-automotive and Armaments Command (TACOM), all subordinates of U.S. Army Materiel Command. TACOM provides and sustains mobility, lethality and survivability for Soldiers, other services and allies through ground combat, automotive, marine and armaments technologies.

CURRENT AND FUTURE CYBER THREATS SPUR COLLABORATION

By CECOM Public Affairs

More than two decades ago, John Arquilla and David Ronfeldt warned in "Cyberwar is Coming!," published in *Comparative Strategy Vol. 12*, that both "netwar" and "cyberwar" were imminent and could impact the 21st century security landscape as significantly as combined arms maneuver warfare had impacted the security landscape of the 20th century.

The prophetic warning has come to light in many ways and on many fronts, from the data breach of millions of security clearance records from the Office of Personnel Management, to emails stolen from Hollywood studios and hacking into the U.S. political process. The federal government even designated every October as Cyber Security Awareness Month.

"The first shots of the next actual war will likely be fired in cyberspace, and likely with devastating effect," said Chief of Staff of the Army Gen. Mark A. Milley. "Many analysts and senior government officials have said their greatest fear is a cyber Pearl Harbor. Very serious cyber capability right now is being developed and deployed by major nation states, some of them not our friends. It is entirely possible to inflict widespread damage on a country's economy and military through cyber attacks."

How to combat what has become a pervasive battlefront, now and in the future, occupies the thinking of many, both within and outside the military environment. DOD has identified cyberspace as an operational domain much like air, land, maritime and space. However, unlike the other domains, no specific military service or component deals with cyber.

The U.S. Army Communications-Electronics Command (CECOM), headquartered at Aberdeen Proving Ground (APG), Maryland, is taking on the cyber warfare challenge in four ways: Security Engineering – designing and delivering resilient architectures and cyber capabilities; Threat Assessments – providing intelligence and threat analysis for command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) programs; Contract Language – incorporating cyber requirements in performance work statements, requests for proposals, and contract awards to mitigate supply chain and software and hardware risk; and Software Assurance – supporting mission assurance by providing tactics, techniques and procedures to ensure that software functions under adverse conditions.

The U.S. Army Cyber Command (ARCYBER) has become the lead for Army missions, actions and functions related to cyberspace,

Capt. Ian Norton, Sgt. 1st Class Tammy Rooks, Chief Warrant Officer 3 Samuel Blaney, Lt. Col. David Allen and Capt. George Allen of the Georgia Army National Guard train at the Georgia Tech Research Institute. This partnership is a key component to the Georgia Guard's success in amplifying its cyber defense capabilities. In two years, the Georgia Guard has grown from one trained cyber defense professional to 25. (U.S. Army photo by Renita Folds)

Second Lt. Ian Reynoso, a student in the Army's first Cyber Basic Officer Leader Course at the Army Cyber School, uses a field computer to probe for a targeted wireless network signal during a field training exercise at Fort Gordon, Georgia. (U.S. Army photo by Capt. Sam Thode)

including the responsibility for planning, coordinating, integrating, synchronizing, directing and conducting Army network operations and the defense of all Army networks. Directly supporting ARCYBER's mission at APG, CECOM, the U.S. Army Communications-Electronics Research, Development and Engineering Center (CERDEC), Program Executive Office Command, Control, Communications-Tactical, and Program Executive Office Intelligence Electronic Warfare and Sensors (PEO IEW&S) lead the technical charge in researching, testing, developing and fielding the tools and software needed to conduct offensive and defensive cyber operations.

The cyber and software communities, with a common nexus among those front-line technical commands at APG, find themselves inexorably tied together due to their critical importance on the battlefield.

CECOM recently addressed the complexity of the cyber and software challenge by convening the first Software Solarium at APG. This event brought together more than 100 senior leaders in the Army software community, along with representatives from sister services and academia.

"This is an opportunity to bring all the leaders and the stakeholders in software to have a meaningful discussion on the future of software and the challenges we face," said Medhat Abuhantash, CECOM Software Engineering Center acting director.

Presenters from the National Security Agency and the U.S. Army Research Laboratory set the stage with deep looks into threats, vulnerabilities, assurances and the long-term future of software development. The solarium involved panel discussions, targeting distinct lines of effort. A panel on enabling a more defensible network by improving integration of software assurance and acquisition life cycle activities related directly to the cyber landscape. Future Software Solariums will continue to explore the need for integration of ARCYBER with the software enterprise.

The 2016 Cyber ElectroMagnetic Activities (CEMA) conference, held in October 2016 on the C4ISR campus at APG, gathered the leaders of the cyber community from the Army, other federal services, industry, academia, and coalition partners from the United Kingdom, Canada and Australia. Co-hosted by the International Association of Old Crows and Maj. Gen. Kirk Vollmecke's team at PEO IEW&S, the four-day CEMA conference focused on achieving overmatch through the convergence of cyber, signal, electronic warfare, intelligence and space capabilities.

Maj. Gen. Bruce Crawford, CECOM commanding general, charged attendees to integrate developing technologies to current hardware, and get capabilities to the Soldier in the field.

"What investments do we need to make to address the new strategic realities of the future?" Crawford asked. "The Army does not fight alone. It is connected to provide capabilities to Combatant Commands. My biggest concern rests with the potential for missed opportunities to get this right for the Soldiers."

Internally, CECOM professionals who help provide tools that develop, defend and sustain Army networks range from the headquarters at APG to the Cyber Center of Excellence at Fort Gordon, Georgia, and the U.S. Army Information Systems Command at Fort Huachuca, Arizona. While CERDEC develops future cyber capabilities, CECOM ensures systems remain mission ready, defensible and protected after they are fielded, said Terry Kalka, team lead for the CECOM Cyber Sustainment Integration Cell.

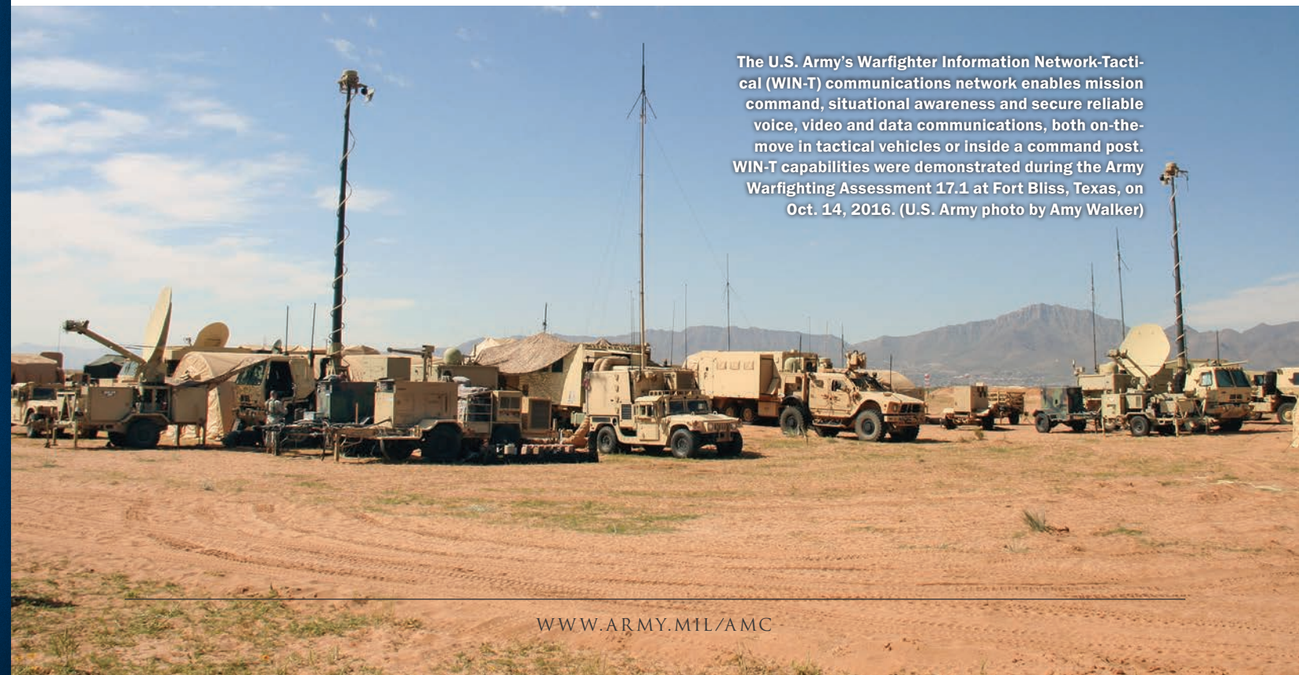
"The cyber battle of the future will require an automated, responsive defense, much like the stock exchange is now mostly automated and moves at faster-than-human speed," said Kalka. "We will need to research and develop self-healing, self-defending networks and systems to keep up with, and ahead of, potential threats."

CERDEC operates a key part of APG's unique laboratory capabilities, networked together to support cyber offensive and defensive development efforts. The center uses its facilities to develop large-scale network visualization; conduct modeling, simulation and emulation; ensure compliance and accreditation; perform supercomputing; and develop tools for information assurance.

"With cyber, it is a lot harder to pin down the threat," said John Willison, director of the Space Terrestrial Communications Directorate at CERDEC. "We have different categories of threats; the insider threat is one category we're worried about. Cyber attacks are obviously another. Depending on which category of threat we're worried about and depending on where we're operating, we look at different technologies or employ different tools to help the network operators and network defenders within that space."

Those cyber-related threats will continue to be addressed by the C4ISR community in many ways, with events like the first cyber blitz held by CERDEC in 2015. The cyber blitz allowed Soldiers from the 25th Infantry Division in Hawaii and the 7th Signal Command Cyber Protection Brigade from Fort Gordon to spend two weeks proofing new operations concepts in a realistic training scenario similar to what they would see at a National Training Center. These activities, and the work CECOM contributes toward the DOD National Cyber Range for training in field cyber operations, show the distinct alignment of cyber and operational readiness, and the path to future dominance of the cyber battlefield.

The U.S. Army Communications-Electronics Command (CECOM), headquartered at Aberdeen Proving Ground, Maryland, is a major subordinate command of U.S. Army Materiel Command. CECOM provides, integrates and sustains command, control, communications, computers, intelligence, surveillance and reconnaissance readiness to enable unified land operations.



The U.S. Army's Warfighter Information Network-Tactical (WIN-T) communications network enables mission command, situational awareness and secure reliable voice, video and data communications, both on-the-move in tactical vehicles or inside a command post. WIN-T capabilities were demonstrated during the Army Warfighting Assessment 17.1 at Fort Bliss, Texas, on Oct. 14, 2016. (U.S. Army photo by Amy Walker)

ARSENAL OF THE BRAVE:
COMMITTED TO SERVING OUR COUNTRY WITH PRIDE

THOUSANDS OF AMC SOLDIERS, CIVILIANS AND CONTRACTORS WORK EVERY DAY PROVIDING OPTIMAL SUPPORT TO THE JOINT WARFIGHTER WITH SKILL, PASSION AND DEDICATION. THEY ARE THE BACKBONE OF THE ORGANIZATION, ENSURING MISSION SUCCESS. ARSENAL OF THE BRAVE PROFILES A FEW OF THE MANY OUTSTANDING INDIVIDUALS FROM ACROSS AMC WHO EXHIBIT THESE VALUES.

U.S. ARMY MATERIEL COMMAND (AMC)

James Dwyer retired in September 2016 as AMC's principal deputy, G-3/4, after 40 years of combined federal and military service. A retired colonel with more than 27 years in uniform, Dwyer had a long and successful career that included commander of the Red River Army Depot in Texarkana, Texas, as well as executive officer at AMC. His efforts at AMC helped ensure that Soldiers around the globe have the proper equipment. In addition to other attributes, Dwyer helped the Army save nearly $50 million in software. *"The best part of the job is the team that we've formed. They are just tremendous, great assets for the Army. It's just amazing what they do,"* Dwyer said.

Col. Gary Grubb was sworn in by former AMC Commanding General Gen. Dennis L. Via as the organization's new Inspector General (IG) in August 2016. Grubb graduated from the Inspector General School in July, following the residence course at the Naval War College in Newport, Rhode Island. Via called the role of the IG one of the most challenging jobs in the command, and also one of the most critical.

Mary Hubbard, executive officer to the AMC chief technology officer, was presented the Army Safety Guardian Award Nov. 4, 2016, for performing the Heimlich maneuver to a choking colleague. The award is presented to individuals who react to an emergency or dangerous situation that avoids injury to Army personnel or damage to Army property. She retired from the Army as a captain in 2015 after 16 years of military service in the Marine Corps and the Army. Hubbard was also presented with the Meritorious Service Medal (MSM) for her work at the U.S. Army Research, Development and Engineering Command from 2006 to 2016. *"I didn't get this MSM by myself. I had a great team and the help of a great staff, and I hope to one day pay it forward to them, somehow,"* she said.

U.S. ARMY CONTRACTING COMMAND (ACC)

Ashley Fahrenkrug, an ACC-Rock Island, Illinois, contracting officer, leads the contracting team responsible for sensors on the Apache helicopter, including the radar electronics unit, fire control radar, modernized radar frequency interferometer and manned/unmanned teaming. In Fiscal Year 2016, Fahrenkrug developed and implemented several innovative methods to reduce acquisition lead times while increasing cost savings achieved through negotiations.

Judy Marchlewicz, a senior human resources analyst with ACC-Warren, Michigan, provides advice and guidance to employees, supervisors and managers across five geographic locations. She is the ACC-Warren performance management program manager and subject matter expert for the Acquisition Demonstration Contribution-Based Compensation and Appraisal System and the Total Army Performance Evaluation System. She manages all aspects and data during the appraisal and pay pool process, and ensures ACC-Warren executes its performance award budget fairly, equitably and within required thresholds.

U.S. ARMY AVIATION AND MISSILE COMMAND (AMCOM)

Tim Cuff, mail clerk with the Directorate of Information Management at Letterkenny Army Depot, Pennsylvania, began his federal service career in 1981 as part of the co-operative program through his high school. He was assigned to the mailroom to process official government mail ranging from letters to boxes of all sizes. Throughout his 35-year career at Letterkenny, Cuff has kept up with the ever-changing federal government and postal service requirements for outgoing and incoming mail, particularly with processing registered, certified, express and insured mail. Known around the depot as the "guy who is always smiling," Cuff delivers mail to each and every building on the depot. *"I like my job. The folks at Letterkenny have been good to me,"* Cuff said.

Barton R. Patterson Jr., a business development specialist in the Business Development Office at Letterkenny Army Depot, has 35 years of experience in federal service there. Patterson started in the electronics shops division working on various missile defense programs. He moved to production engineering, continued his work with missile defense systems, and expanded his depot knowledge while working with quality assurance to develop the depot's first article test and inspection process. *"The knowledge I gained over 35 years working with all of the wonderful people at Letterkenny has made my transition to the Business Development Office quite easy,"* Patterson said.

U.S. ARMY MATERIEL SYSTEMS ANALYSIS ACTIVITY (AMSAA)

Tiffany Gutowski, an operations research analyst for AMSAA at Aberdeen Proving Ground (APG), Maryland, is responsible for performing analyses that show how chemical, biological, radiological and nuclear equipment performs to protect Soldiers and the public, and provides information to leaders supporting better-informed acquisition decision-making. Gutowski, recently recognized as the AMC Employee of the Quarter, is an engaged volunteer who was a featured speaker at the recent APG Women's History Month Ceremony and regularly participates in community outreach and organization improvement efforts.

Henderson "Mitch" Mitchell,

an electronics engineer at AMSAA, was the recipient of the Ripple Effect Award for his commitment to Harford County youth, where he has been a tutor, mentor and role model for more than 20 years with the Maryland Freestate ChalleNGe Academy, Windsor Valley Community Center, Boys and Girls Clubs of Harford County – Edgewood Unit, Harford County Public Library, and Edgewood High School. Each year, Mitchell takes young men from the Edgewood High School Male Mentorship program on a college field trip. Several of those men are now college graduates working as engineers and in other capacities at Aberdeen Proving Ground.

U.S. ARMY SUSTAINMENT COMMAND (ASC)

Jerome McNair, a logistics management specialist with Army Field Support Battalion-Bragg, has provided logistics support for the 3rd Special Forces Group at Fort Bragg, North Carolina, since 2009. McNair deployed in support of the first Gulf War and Bosnia-Herzegovina. He retired from the Army as a chief warrant officer 4 after 30 years of service, and later deployed twice to Afghanistan as a Department of the Army Civilian. *"My favorite part of the job I do now is supporting the warfighter,"* said McNair. *"I love to support the Soldiers, the combat mission; I love supporting the commander's intent."*

David S. Saenz, logistics management supervisor at the Logistics Readiness Center-Carson at Fort Carson, Colorado, oversees the logistics planning and synchronization with higher headquarters and senior command; performs quality assurance and surveillance of the contract; ensures audit readiness; manages the government purchase card; and performs intelligence and security functions. Saenz served in the Army 23 years and has spent more than a decade as a Department of the Army Civilian. He said the best part of his job is providing needed services to the warfighter.

U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND (CECOM)

Terence Adair Glover was named a recipient of the Louis Dellamonica Award for Outstanding AMC Personnel of the Year 2015. A supervisory logistics management specialist, Glover serves as the CECOM C3T Directorate WIN-T Division chief at Aberdeen Proving Ground, Maryland. Glover served as a mentor in the Integrated Logistics Support Center's (ILSC) Mentorship Program and led his team in negotiation efforts in one of the largest single amounts ever awarded to combat Diminishing Manufacturing Sources and Material Shortages in the ILSC. Glover continues to motivate, encourage and inspire fellow employees to improve the quality of their own work. *"This award was such a surprise, but it really means a lot to me. It is the result of a lot of hard work and numerous hours,"* he said. *"So, it is nice to be recognized and I am truly humbled by this very special honor."*

Ayodeji Omololu is the senior command synchronization officer at CECOM. A U.S. Navy veteran, Omololu served proudly for nearly 10 years, mastering his skills as a surface warfare qualified storekeeper, now known as a logistics specialist. Son of Nigerian-born parents, Omololu and his family immigrated to the United States from Nigeria while he was still a teen. *"I joined the Navy to serve my country and explore new possibilities,"* he said. *"I was also inspired by the exemplary attitude of my neighbors who had enlisted in the U.S. Marine Corps, U.S. Air Force and U.S. Army."*

JOINT MUNITIONS COMMAND (JMC)

Aimee Bland serves as a product quality manager at JMC in Rock Island, Illinois. As a product quality manager since 2009, she is responsible for assuring quality requirements are integrated throughout the ammunition life cycle for her assigned commodities. She performs a variety of functions, including audit verification, inspection system evaluation, document control and continuous improvement. The first five years of her career were spent supporting the Small Caliber Division, specifically managing the quality oversight of 5.56 mm ammunition. She currently supports the Ground Munitions and Close Combat divisions as the lead product quality manager. In addition to quality item oversight, she ensures workload is organized and balanced, while providing guidance and training to team members. She also serves as a quality focal point for relations with producers, program managers and the technical community.

Stanley J. Quinn, a retired Army sergeant first class who continues to serve his country as a civilian, is currently working for JMC's Sexual Harassment Assault Response and Prevention Team, as the SHARP program manager. Quinn began his career with the federal government in 1988 as a 16R Vulcan crewmember and rose through the ranks in the Air Defense Artillery Branch until 2016. He served as the Sexual Assault Response Coordinator for the 10th Army Air and Missile Defense Command from 2011 to 2016, when he began his role as SHARP program manager. His primary duties include prevention training for sexual harassment and sexual assault, ensuring all survivors of sexual assault receive proper advocacy. He is responsible for both military and civilian personnel within the JMC footprint. Currently, he is the only full time SHARP person within the organization.

U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND (RDECOM)

Sally Edler, a mechanical engineer and business manager for joint interagency activities in the engineering directorate at the Edgewood Chemical Biological Center (ECBC) in Edgewood, Maryland, was recently named Woman of the Year by the Women In Defense (WID) Mid-Atlantic Chapter. Edler was hired at ECBC in 1981, and since then has supported several major programs in chemical and biological defense, including the Nuclear Biological Chemical Reconnaissance System, Chemical Agent Monitor, Automatic Chemical Agent Alarm, and two generations of the Biological Integrated Detection System. Considered a trailblazer by her WID colleagues, Edler was the first woman to chair a student chapter of American Society of Mechanical Engineers; the first woman to chair a student chapter of Joint Engineering Societies; and the first woman to work in the engineering test group and the power plants at Baltimore Gas and Electric. She has volunteered countless hours to advocate women's roles in the defense industry and in science, technology, engineering and mathematics fields, and mentors junior employees. *"It is important for all of us to contribute to our community in some way, and we don't have to look far to find someone who would benefit from our assistance,"* she said.

Dr. Terrance West became the first African-American to receive a doctorate in electrical engineering from Mississippi State University in 2009. He is the first member of his family to attend college. West serves as the executive officer for the U.S. Army Aviation and Missile Research, Development and Engineering Center on Redstone Arsenal, Alabama, where he assists with daily organizational management and activities that support long-term success for the center. Before his current assignment, West worked for the Systems Simulation and Development Directorate's Millimeter-wave Simulation System-2 hardware-in-the-loop laboratory supporting the Patriot missile system.

MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND (SDDC)

Sgt. 1st Class Jeryn Harvey,

executive assistant to the SDDC command sergeant major at Scott Air Force Base, Illinois, was recently selected for induction into the Sergeant Audie Murphy Club, an exclusive Army organization for NCOs who have demonstrated outstanding leadership and performance. To be inducted, NCOs must be recommended, pass a physical training test, and appear before several rigorous selection boards. Only about 2 percent of NCOs in the Army have distinguished themselves by being inducted in the Sergeant Audie Murphy Club.

Dr. Hui-Chol Son is a South Korean local national employee who has served with the U.S. Army for more than 33 years. A prior captain and paratrooper in the Republic of Korea army, he joined the 837th Transportation Battalion in Busan, South Korea, as a shipping clerk in 1983. His dedication and professionalism allowed him to rise through the ranks to serve as the unit's Cargo Documentation Section chief, one of the two highest-level positions for a local national. Son also earned his doctorate in shipping management in 2002 from the Korean Maritime University. Son's meticulous attention to detail and management skills led the way during his unit's recent organization inspection, where he earned a Gold (Commendable) rating in the "Booking" section.

U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND (TACOM)

Adele Saba was honored as one of

Detroit Crain's Business' 2016 "40 under 40" award winners, an annual selection of 40 overachievers under 40 years of age. The award is based on factors such as financial impact and community leadership. She is currently a program analyst with the Tank Automotive Research, Development and Engineering Center, but was working as a program analyst in the TACOM G-8 Resource Integration Office when she was nominated. Saba led the TACOM G-8 team charged with developing strategy and disbursement of the command's largest budget element, $500 million annually, dedicated to the overhaul, repair, refurbishment and upgrade of equipment returning from combat operations around the globe. Saba said her parents, who emigrated from Jordan, were proud of the accomplishment. *"They were really proud of me and they felt happiness because they came here from another country to get a better opportunity,"* Saba said.

Julie Stites, lead in the Audit Readiness Cell (ARC) established at TACOM in 2015, was recognized with the 2016 Association of the United States Army Regional Army Civilian of the Year Award. Stites' previous experience at Defense Finance and Accounting Service and her supervisory experience in the TACOM Integrated Logistics Support Center (ILSC) made her the perfect candidate to lead the ARC at TACOM. Her accounting background provided her the audit and internal control expertise to ensure TACOM's processes are audit ready. Her knowledge of the ILSC gives her the ability to network throughout the command in obtaining samples and documentation, and change the culture to obtain audit readiness.

U.S. ARMY SECURITY ASSISTANCE COMMAND (USASAC)

Sarah Bean, a senior central case manager, has been working for USASAC since May 2009. Before her current position, she worked as an analyst, logistics management specialist and central case manager for the Saudi Arabia program. Throughout her career at USASAC, every job she has held has been in U.S. Central Command's Regional Operations Division. She enjoys working with the foreign partners and a multitude of individuals across the Army's Security Assistance Enterprise. Bean likes how every day presents a new challenge that allows her to gain knowledge and experience to share with others.

Branda Bell is a human resources specialist in USASAC's G-1 Directorate. Providing guidance and advice to employees and management on a wide variety of civilian personnel matters, Bell has been with USASAC since 2009. She enjoys helping people and says when she successfully accomplishes her job, personnel are able to concentrate on the mission. She has served on USASAC's Combined Federal Campaign team for seven consecutive years, including three as the financial chairperson. Bell said she enjoys serving the community and volunteers with the Girl Scouts of America, Huntsville Botanical Gardens and Huntsville Hospital Foundation. She is also a member of the following organizations: National Conservation, Air Force Wings, Arbor Day, Phi Theta Kappa International Honor, Golden Key National Honor and National Rifle Association. An Air Force veteran, Bell is proud of her military service in the field of logistics readiness.

UNIFIED ACTION TEAM ACHIEVES READINESS THROUGH AIRCRAFT MODERNIZATION

By AMCOM Public Affairs

An AH-64 Apache flies in Afghanistan. (U.S. Army photo)

Developing and delivering responsive aviation, missile and calibration materiel readiness to optimize joint warfighter capabilities is the U.S. Army Aviation and Missile Command's (AMCOM) fundamental mission. The command's materiel enterprise contributes to completing the mission by providing security for the nation, its deployed formations and American allies through active daily missions and deterrence.

The February 2016 Unified Action mission alignment order that collectively bonds the U.S. Army Contracting Command-Redstone and the U.S. Army Aviation and Missile Research, Development and Engineering Center (AMRDEC) with AMCOM is key to these activities and mission accomplishments.

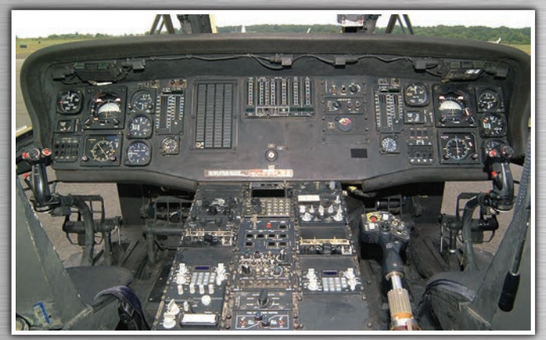
"Because of Unified Action, we can focus on the end state: the life cycle of the program," said Maj. Gen. Douglas Gabram, AMCOM commanding general. "We focus on designing in sustainability and reliability in the system from the outset. That way, we can reduce operation and maintenance cost drivers."

The recent Apache Helicopter Pitch Change Link challenge and future Black Hawk helicopter development plan are prime examples of the operationalization of Unified Action.

MATERIEL ENTERPRISE PARTNERS

When the Pitch Change Link Rod Team formed in 2015, its primary goal was to come up with a solution to an aviation challenge raised by Soldiers in the field. The team rapidly produced and fielded a standardized 10-piece tool kit, coupled with an instructional video for use by Soldiers maintaining the Apache fleet.

CURRENT ANALOG H-60L



H-60V

FROM TOP: The electronic instrument displays found in the newest variants of the UH-60 Black Hawk will help extend the life and capabilities of the helicopter. (Photo courtesy of Northrop Grumman)

The modernized UH-60V cockpit is a direct product of Unified Action cooperation. (U.S. Army photos)

FROM TOP: A Fort Campbell, Kentucky, Logistics Readiness Center Soldier works on an Apache Pitch Change Link. (U.S. Army photo by Rod Johnson)

A Soldier assigned to the 1st Battalion (Attack), 3rd Aviation Regiment, 12th Combat Aviation Brigade, conducts preventive maintenance checks and services for an AH-64D Apache helicopter at Grafenwoehr Training Area, Germany. Soldiers now have a standardized 10-piece tool kit, coupled with an instructional video, to maintain the Army's Apache helicopter fleet. (U.S. Army photo by Christoph Koppers)

"The filming of a 'Safety of Flight' video for instructional clarification of maintenance procedures is new to AMCOM," said Col. Andy Gignilliat, AMCOM Logistics Center military deputy, and a team member. "The video augments written references in a manner that provides a familiar learning experience for our Soldiers. The 96th Aviation Support Battalion Soldiers and Fort Campbell's Logistics Readiness Center-Aviation did a phenomenal job reacting quickly to assist in providing a professional product to the entire aviation force."

Brig. Gen. Bob Marion, Program Executive Officer Aviation (PEO Aviation), along with Col. Jeffrey Hager, Project Manager Apache Attack Helicopter, served as key collaboration leaders as the Pitch Change Link Rod Team came together to execute the action plan.

"The Unified Action team holds to the standard of excellence that enables readiness at the point of need," said Gabram. "And that standard has been exemplified in the way that the team has come together on the Apache Pitch Change Link."

ACQUISITION GAME CHANGER

Another example of Unified Action providing positive outcomes for the warfighter is the team's collaborative effort to spearhead the Army's newest utility helicopter modernization, the UH-60V, with first flight scheduled in early 2017. The team is developing a plan to manage the production and modernization of the UH-60L to meet current and future requirements by converting the analog cockpit to full digital capabilities.

The UH-60V Milestone Decision Authority is delegated to PEO Aviation with AMRDEC serving as the system integrator. The AMRDEC Prototype Integration Facility is responsible for the installation of prototype kits on three aircraft that will be used for testing throughout the engineering and manufacturing development phase of the program. During full-rate production, contracts will be awarded through full and open competition. In total, 760 aircraft will be converted to UH-60V models as part of the program.

"The program has met all its acquisition baseline milestones and will enable the UH-60L fleet to remain operationally relevant while improving aircrew situational awareness through digitization of the cockpit," said Lt. Col. Andy Duus, product manager for the UH-60V. "The UH-60V prototype first flight remains on schedule, and the cockpit design is expected to meet performance requirements."

The new Black Hawk variant will achieve cost avoidance by eliminating the UH-60L's specific analog, federated components, while recapitalization provides a 10-year service life extension. The modernized cockpit will also feature enhanced situational awareness with consolidated aircraft survival equipment, hover cues on the horizontal situation indicator, a geospatial information services digital map, and a global air traffic management system.

"What's more, the UH-60V is a key piece on the Army aviation modernization that offsets limitations in funding for the new production UH-60M models," Gabram said. "The UH-60V research, development test and engineering, as well as procurement, is fully funded across the program objective memorandum."

The alignment of organizations across the aviation and missile enterprise allows AMCOM to prioritize and posture itself to best support the warfighter, Gabram said.

"Although the full impact of Operation Unified Action will take time, these recent actions are examples of what we can expect as this significant and important mission realignment evolves to meet warfighter needs," he said.

The U.S. Army Aviation and Missile Command (AMCOM), a subordinate of the U.S. Army Materiel Command, develops, acquires, fields and sustains aviation, missile and unmanned vehicle systems. As a life cycle management command, AMCOM assures aviation and missile readiness with seamless transition to combat operations.

ONE ARMY, INDIVISIBLE: TOTAL FORCE INTEGRATION TO MOVE AND SUSTAIN THE ARMY

By SDDC Public Affairs

To maintain readiness, it is more critical than ever that the Army fully leverage the capabilities resident within its Reserve Component (RC), especially during a time when the Army's Active Component (AC) is experiencing decreases in both budget and size.

"Much of America's Army capacity is resident in the Reserve Components, and we must rely more heavily on them to meet the demands of a complex global environment," said Army Chief of Staff Gen. Mark A. Milley, during an Army Total Force initiative launch in March 2016.

Upon assuming his duties as chief, Milley's initial message to the Army clearly cited readiness as his top priority.

The relationship with the RC is evident within the Military Surface Deployment and Distribution Command (SDDC) as it moves and sustains forces, materiel and families across the nation and around the globe. To accomplish its mission, SDDC depends upon its RC force in the Deployment Support Command (DSC).

"The Deployment Support Command is key to my strategy," said Maj. Gen. Kurt J. Ryan, SDDC commanding general. "If I can't get my Reserve forces into the fight, I can't cover the gap. Reserve Component integration with our active force is critical to my ability to be ready to fight tonight."

The DSC, commanded by Army Reserve Brig. Gen. Steven Eveker and headquartered in Birmingham, Alabama, consolidates all Army Reserve surface mobility units under a single organization. With four Reserve transportation brigades, the DSC provides command and control and technical supervision of all SDDC-aligned Reserve units and is a key enabler for the command.

By integrating Active and Reserve forces, Ryan ensures that when SDDC is called to the fight, his entire force has the training and skills required to do the job, is trained to the same standard and prepared to deliver readiness to the joint force.

"It's important to integrate the training of both the Reserve and Active force, because we must train as we fight," said Navy Capt. Aaron Stanley, SDDC's director of operations. "It is crucial that every member of the SDDC team has the training and skills required to fully perform their task or function. Regardless of whether they are Active Duty or Reserve, operating in the continental U.S. or overseas, and regardless of their specialty, it's imperative that every member of the SDDC team is trained to the standard needed to complete the mission."

The integration of SDDC's Active and Reserve forces into an operational "Total Force" is fully supported throughout the command, according to Eveker.

"Maj. Gen. Ryan does not see the DSC as a supplementary add-on to SDDC's capabilities; we are fully integrated into the mission," he said. "When the SDDC commander talks about his units, he talks about nine brigades, always including four Reserve units with five AC units."

To be ready for the fight, SDDC aligns its total force to train together in peacetime so that they are prepared to execute wartime missions as a team. This is accomplished by integrating its Active and Reserve forces in both training exercises and operational missions within the U.S. and globally.

"Whenever possible, we want to have our Active and Reserve Components work together side-by-side, in executing the upload and discharge of various vessels to ensure they can successfully perform the processes and operate the systems that are required to perform their jobs," said Stanley.

Eveker says his Reserve units benefit the most when the DSC is included in operational missions with their Active Duty SDDC brigade counterparts, because they are not only receiving valuable training, but also executing their wartime mission requirements and Soldier skills.

"Any chance I have to send my units to perform their mission is a priority, because there is no better training opportunity than actually conducting our mission alongside our AC counterparts," said Eveker.

Throughout his 25-year career in the Reserve, Eveker has seen the relationship between the AC and the RC evolve. He noted that since the 9/11 attacks, the Army Reserve has transformed from a strategic force into an operational force, and this has required the Reserve to step up and be more integrated into its training and mission support with AC counterparts.

"We've transitioned from just talking about AC-RC integration to making it work very successfully," Eveker said. "Quite honestly, I think people will point to SDDC and say, 'that's the model for how total force integration is done.'"

SDDC is committed to supporting the Army chief of staff's top priority of readiness, Ryan said, and by successfully integrating his Active and Reserve forces into one "total force," SDDC remains ready to "fight tonight."

The Military Surface Deployment and Distribution Command (SDDC), a subordinate organization of the U.S. Army Materiel Command and Army Service Component Command of the U.S. Transportation Command, delivers world-class, origin-to-destination distribution solutions. Whenever and wherever Soldiers, Sailors, Airmen, Marines and Coast Guardsmen are deployed, SDDC is involved in planning and executing the surface delivery of their equipment and supplies.

OPPOSITE: U.S. Army Reserve Soldiers train to sharpen their tactical and technical skills in combat-like conditions at Fort Hunter Liggett, California. (U.S. Army photo by Spc. Daisy Zimmer)

BELOW: Spc. Warren Beaty, right, and Spc. Alexander Harris, cargo specialists assigned to SDDC's Deployment Support Command, create cargo load documents during the Army Reserve exercise TRANS WARRIOR 2016. The exercise provided Mission Essential Task List-focused training and addressed fundamental Soldier skills. (U.S. Army photo by 1st Sgt. Timothy Lawn)

Sgt. Shawna Rockwell, an Army Reserve transportation NCO with the Deployment Support Command's 1186th Deployment and Distribution Support Battalion, uses a remote scanning device used to process cargo shipments during a recent Sealift Emergency Deployment Readiness Exercise conducted in Jacksonville, Florida. (U.S. Army photo by John Orrell)

U.S. Army Reserve Soldiers fire M16A2 rifles for qualification at MacDill Air Force Base in Tampa, Florida. (U.S. Army photo by Spc. Tracy McKithern)

ACROSS THE YEARS

The U.S. Army Materiel Command (AMC) took responsibility for the Army's research and development (R&D) functions in the early 1960s, and for the two decades that followed, the efforts of their scientists and engineers had a dramatic impact on preparing the Soldiers of today for battlefield supremacy.

ARMY SCIENTISTS AND ENGINEERS ARE RESPONSIBLE FOR MATERIEL INNOVATIONS MOSTLY DEVELOPED IN RESPONSE TO ENEMY TACTICS AND METHODS THAT DID NOT FIT PATTERNS ESTABLISHED IN PRIOR CONFLICTS.

AMC'S R&D EFFORTS DURING VIETNAM

Early in the 1960s, as American involvement in Vietnam began to escalate, the newly activated AMC took command over what had been the Army's technical services and in turn, leadership in the Army's R&D community.

In those early days, AMC consisted of more than 190,000 personnel with more than 250 installations, activities, arsenals and laboratories responsible for an inventory of weapons and equipment worth more than $23.5 billion and a budget of more than $7.5 billion.

Army scientists and engineers were responsible for many of the materiel innovations of that war, mostly developed as a response to the enemy's tactics and methods that did not fit the patterns established in prior conflicts. The elusive nature of the enemy, for example, led to improvements in reconnaissance and surveillance equipment. The terrain in Vietnam gave greater importance to helicopters, leading researchers to modify the Army's fleet for a variety of uses.

While Army scientists and researchers of the time were not necessarily working to support the "Soldier of tomorrow," the technical innovations they developed did help to provide the building blocks for breakthroughs to come.

BUILDING THE MODERN ARMY: R&D AFTER VIETNAM

As the U.S. involvement in Vietnam came to an end in the early 1970s, DOD and the Department of the Army recognized the importance of focusing on R&D efforts that would provide the ability to maintain readiness for a potential conflict with the Soviet Union.

Seeing the advancements in weaponry and equipment that the Soviet Union had made, and with concerns about Soviet numbers, Army R&D efforts were primarily focused on developing a quality advantage.

Army senior leaders had plans to modernize virtually every major item of equipment by the mid-1980s. The major developments to come out of this era are commonly referred to as the "Big 5" – the Abrams main battle tank, Bradley fighting vehicle, Apache attack helicopter, Black Hawk utility helicopter, and Patriot air defense missile system.

Army researchers, realizing that progressive changes are far easier to implement than restarting with entirely new systems, designed the Big 5 to be upgradable. Models of the Big 5 used in

Innovations made by U.S. Army researchers in the early 1970s on air traffic control systems are still seeing impact today as mobile towers play an integral role in airfield operations at locations around the world.

The Black Hawk helicopter entered service in 1979 and was first used in 1983 during the invasion of Grenada. Army researchers, working with their partners in industry, continue to improve the system for today's Soldier.

PAST AND PRESENT ARMY R&D INNOVATES FOR THE SOLDIER

For decades, Army researchers have conducted a wide variety of tests to ensure that Soldiers and their equipment can operate in a variety of conditions, whether it is the cold of the arctic, the heat of the desert, or the dangers posed by chemical or biological hazards.

The U.S. military began using mobile radar systems to detect enemy artillery fire in the 1960s. Army researchers have worked for decades since to improve counter-fire radars to detect and track enemy mortar, artillery and rocket fire with minimal crew requirements.

(U.S. Army photos)

U.S. Army researchers have used a variety of testing methods over the past 40 years to ensure that Soldiers have access to the finest wheeled and tracked vehicles in the world.

(U.S. Army photos)

Iraq and Afghanistan were leaps and bounds ahead of the models originally fielded in the 1980s, and continued to have an ongoing and important impact on the battlefield.

In addition, supporting systems made significant advances in the fields of command, control, communications and intelligence, logistics and more. AMC scientists and engineers helped to supply the most advanced radios, switches, teletypewriters and telephones the Army had ever seen.

They were also on the forefront of developing and implementing a new generation of night vision devices, the TOW missile system, advances in food technology for Soldiers, warehouse and maintenance technologies, numerous weapon systems, ground combat systems such as the Humvee, upgrades in helmet and body armor, and much more.

In 1975, as development of the Big 5 was in full swing and accounted for almost 50 percent of the Army's R&D funding, the Assistant Secretary of the Army for Research and Development Norman Augustine recognized the time, effort and commitment it takes to get the best systems in the world to the battlefield.

"[These systems] represent the edge that will be crucial to our Army's chances of success should war occur," said Augustine in his 1974 budget proposal to Congress. "Systems and counter-systems race neck and neck, each gaining temporary advantages which are then overcome by opposing technology – but which at any particular time can produce decisive results.

"We cannot lag, even for a little while, in developing and expanding our technology or we risk severe consequences."

A LASTING IMPACT

While open conflict with the Soviet Union never occurred, the improvements made by AMC's R&D community throughout the Vietnam War and into the early 1980s helped to set the stage for today's fighting force.

As AMC and the U.S. Army R&D community work to outfit the Soldiers of tomorrow, systems like the Apache and Abrams, as well as the many advancements in armor, weapons, ground systems, logistic support technologies and communications and electronics made during the post-Vietnam era, continue to provide unmatched materiel capabilities on the battlefield.

LOG CHRONICLES

HIGHLIGHTING THE CONTRIBUTIONS OF LOGISTICS PROFESSIONALS

The U.S. Army's first African-American senior research scientist, Dr. Paul Ruffin, played an integral role in research and development efforts over the past 30 years.

Ruffin, who retired from the U.S. Army Aviation and Missile Research, Development and Engineering Center (AMRDEC) in 2013, was promoted to the highest rank for a research scientist in 2003, following two decades as one of the Army's preeminent minds in fiber-optics, nanotechnology and microelectromechanical systems.

Ruffin began working for the Army Civilian workforce in 1982, and over the three decades that followed, his work resulted in 10 patents that would lead to critical capabilities for Soldiers in the field. His work was recognized with various honors and distinctions, including the 2010 Presidential Rank Award of Meritorious Executive.

"There were certain patents I received that changed the way we did research," he said. "As a senior research scientist for micro sensors and systems, I tried to make sure that the U.S. Army remained at the forefront of a scientific and technological competence that is mission critical to the future warfighter. We needed to show the world that we were the leaders in the field."

Q: Between the time you joined the Army Civilian workforce in 1982 and the time you left in 2013, how did you see Army research change?

A: I came along at the best time to be doing research for the Army. Army leadership stressed R&D and hands-on work. When I retired, we had gotten to the point where we did not have enough hands-on work to attract the best young engineers and scientists. When I went to work for the government, my boss at the time said, "This is your lab." I started with my own laboratory. That may never happen again.

Q: What did you work on that you are most proud of?

A: The best work I did was in fiber-optics, when I came up with a patent for a fiber winding method that solved a 20-year-old problem in the fiber-optic gyroscope community. The method greatly contributed to the success of a variety of technologies used in tactical weapons, commercial and military aircraft and many others.

Q: Do you think the work you did had a positive effect on the Soldier?

A: Everything we did was about the customer, and the customer for my research was the Soldier. The Soldier benefited because of the work we did. We developed systems that allowed the Soldier to make better decisions on the battlefield. We were able to give them the most advanced technology we could at the time.

EXPERIENCE TAKES SECURITY ASSISTANCE ENTERPRISE INTO THE FUTURE

By USASAC Public Affairs

"Ready, Set, Go!" is the phrase used by the U.S. Army's Security Assistance enterprise to introduce plans. "Ready for today, set the conditions for tomorrow and go forward with trust and teamwork." That is how Maj. Gen. Stephen Farmen, U.S. Army Security Assistance Command's (USASAC) commanding general, describes the organization's efforts to enable unified operations and prepare for the future state.

Farmen had served just over three months at the helm of USASAC when he began sharing his 100-day assessment with the workforce at town hall meetings and other forums.

"I want everyone to recognize the USASAC motto, 'Strength in Cooperation,' which describes how we connect the U.S. Army Materiel Command (AMC) Security Assistance enterprise and use Foreign Military Sales (FMS) to build partner capacity," he said.

Building partner capacity helps international partners defeat terrorism and deter threats in their regions, reduces the number of U.S. troops who deploy in support of allies and helps protect American borders. Farmen explained that this is all an effort to bolster Army readiness.

USASAC, which boasts a $175 billion portfolio in security assistance and FMS programs, plays a critical role in advancing the U.S. National Security Strategy, both now and in the future.

"Some people just look and see the numbers, the billions of dollars and the thousands of cases that make up FMS, but that is not how we measure success," Farmen said. "We measure our contribution to strategic readiness through our delivery of capability to our international partners."

Speed and trust are key factors in increasing efficiencies, and therefore, value, Farmen said, and he wants to shatter the myth that the FMS process is slow and bureaucratic.

"It is not true when you see how [FMS cases] are prioritized. We stay aligned and connected with Combatant Command priorities," he said, adding that this ensures partners with critical needs will get the materiel they need on time.

His strategic framework for USASAC incorporates priorities, stakeholders, lines of efforts, the current state of operations and the future, or next-generation USASAC.

USASAC priorities are designed to support AMC and the Chief of Staff of the Army's priorities, and the Secretary of the Army's focus areas.

"While we are an Army organization under AMC, we still have to respond to the Deputy Assistant Secretary of the Army for Defense, Exports and Cooperation and Defense Security Cooperation Agency (DSCA)," he said, adding that the organization never forgets its unique role in implementing security assistance and FMS for the Army, and for stakeholders outside the Department of Defense like the State Department and Congress.

Farmen used the word "gold standard" to explain USASAC's vision as DOD's premiere security assistance provider.

"We are doing 55 percent of the FMS workload for DSCA, so we must continue and try to set the gold standard," he said.

The USASAC workforce remains steadfast and will continue to lead the AMC Security Assistance enterprise, build partner capacity and support and strengthen U.S. global partnerships.

"USASAC delivers four Ts: trust, transparency, teamwork and the Total Package Approach," Farmen said. "We are a 'team of teams' when we bring together DSCA, the Assistant Secretary of the Army for Acquisition, Logistics and Technology and the Combatant Commands. Then USASAC works below those groups to synchronize and implement the work of the AMC Security Assistance enterprise."

The "team of teams" is expanding strategic readiness through the "Ready, Set, Go!" effort, setting conditions to shape the future, and going forward with a trustworthy, well-trained and well-equipped workforce, Farmen said. These actions will enable unified operations in the current state, 2017-2025, but will also allow USASAC to plan for the future state, 2026-2040.

The professionalization of the workforce will play a key role in the enterprise moving forward, Farmen said.

"People are our strategic advantage," he emphasized.

While the next generation USASAC "may be selling different equipment and delivering it differently, USASAC will continue to build partner capacity and ensure the customer gets what it paid for to enable unified operations now and in the future," Farmen said.

But, he added, it will never stray from its proven formula: "Trust plus teamwork equals strength in cooperation."

The U.S. Army Security Assistance Command (USASAC) has been providing Army materiel and services to foreign partners through security assistance and Foreign Military Sales for 50 years. USASAC programs help Combatant Commands build eligible international partners' capacity to provide both interoperability and an independent capability in their areas of responsibility, which is vital to achieving U.S. national security objectives. A subordinate command to the U.S. Army Materiel Command, USASAC has relationships with 153 countries and more than 5,000 cases with a total program value of $175 billion.

LEFT: A line of Bradley fighting vehicles are ready for offloading at the Yermo, California, rail yard by members of the 347th Regional Support Group. (U.S. Army photo by Capt. Kevin Cronen)

BELOW: Lt. Gen. Eid Bin Al-Shalawi, Royal Saudi Land Forces commander (left), provides opening comments while Lt. Gen. Michael Garrett, U.S. Army Central commander, Ann Cataldo, Deputy Assistant Secretary of the Army for Defense Exports and Cooperation, and Maj. Gen. Stephen Farmen, commander of the U.S. Army Security Assistance Command, listen during the 3rd annual U.S. and Saudi Grand Security Assistance Review held in Washington, D.C., in October 2016. (U.S. Army photo by Richard Bumgardner)

Chief Warrant Officer 2 Christina Winfield (right) and Chief Warrant Officer 2 Anthony Sloan, logisticians with the 310th Sustainment Command (Expeditionary) Advise and Assist team, track the receipt of a shipment of M1A1 Abrams tank repair parts acquired by the Iraqi security forces through Foreign Military Sales. (U.S. Army photo by Capt. A. Sean Taylor)

INTERN PROGRAM INFUSES NEW BLOOD INTO CONTRACTING WORKFORCE

By Ed Worley, ACC Public and Congressional Affairs

The U.S. Army Contracting Command (ACC) is using two programs, in addition to the normal competitive appointment process, to hire interns and other select employees to grow its contracting workforce and set conditions for the future.

The Pathways Internship Program and the Department of Defense Expedited Hiring Authority (EHA) for Select Defense Acquisition Workforce Positions make it possible for hiring officials across ACC to fill developmental positions and immediate shortages in the workforce.

"The intern program is the life blood of ACC, because it is how ACC brings in new people," said Denita Walters, ACC's intern program manager.

ACC currently has about 400 interns on board, Walters said. The command hired 51 interns in Fiscal Year 2016 and received 170 allocations for FY17, which is still short of the command's needs. Interns are funded by the Army Civilian Training, Education and Development System, or ACTEDS, and the Defense Acquisition Workforce Development Fund.

ACC uses the Recent Graduate Program under Pathways to provide developmental experiences intended to promote civil service careers for recent college graduates – those who completed their degrees not more than two years prior to applying for the program. Veterans have six years after degree completion to apply.

Under the Recent Graduate Program, candidates must have a bachelor's degree that includes 24 semester hours in a business-related discipline from an accredited college or university.

ACC uses outreach programs to find suitable candidates for the program, as well as to inform people about what ACC is and what the command does, Walters said.

"They usually think we are contractors," she said. "That gives us the opportunity to explain ACC's mission. They then become interested in working for the government. We have a contracting specialist at the booth who explains the contracting career. We also explain the unique things each of our contracting centers and commands do, and show them the map of our locations. We then tell them how to apply for an intern position."

ACC interns support multiple acquisition workforce positions, but the bulk of the positions are for contract specialists – ACC's core mission specialty. Interns must complete a specific training plan, including a contracting boot camp, and earn their Defense Acquisition Workforce Improvement Act Level II certification within two years of hiring.

The intern program's success has affected ACC's expedited hiring program, according to Mary Woodard, the program manager.

"We don't use the expedited hiring authority as much as we used to because the interns are coming up through the system, so we're promoting from within," Woodard said.

The authority granted by the Department of Defense's expedited hiring guidance permits hiring for select acquisition workforce positions where there is a shortage of candidates or for a critical hiring need. The current authority runs through Sept. 30, 2017.

ACC uses the program to fill contracting specialist positions at various experience levels, Woodard said. She added that qualified candidates can be hired "basically on the spot."

"It allows us to hire regardless of any special category," she said. "It helps balance the candidate pool so we can hire the best candidate."

She said the ACC-Rock Island, Illinois, contracting center has had the most success with EHA.

RIGHT: Emily Wikner, an Army Research Laboratory intern, assists in battery research. (U.S. Army photo by Conrad Johnson)

Soldiers with the 1053rd Transportation Company, 1050th Transportation Battalion, 228th Theater Tactical Signal Brigade, South Carolina Army National Guard drive through roads flooded by the heavy rains caused by Hurricane Matthew in October 2016. (U.S. Air Force photo by Tech. Sgt. Jorge Intriago)

FROM LEFT: Ryan Jackson is a contract specialist at the Army Contracting Command-Warren, Michigan, contracting center. (U.S. Army photo by Catherine Liedke)

Philip Crowley was hired under the Expedited Hiring Authority in October 2016 as a contracting specialist in the Reachback Contracting Division at Army Contracting Command-Rock Island, Illinois.

Emily Watkins, hired under the Expedited Hiring Authority in September as a contracting specialist in the Technology and Logistics Support Division at Army Contracting Command-Rock Island, said she has enjoyed her first month learning the basics of government contracting. (U.S. Army photos by Liz Greenawalt)

The contracting center hired 50 employees during FY15 and FY16 using EHA, with a 90 percent retention rate, according to Theresa Harrison, ACC-RI Human Resources Branch lead program specialist.

The Pathways program also supports the Equal Employment Opportunity Special Emphasis Program (SEP) through recruiting trips. In 2016, ACC representatives attended the Federal Asian Pacific American Council Annual Leadership Training Conference, the Society of American Indian Government Employees National Training Program, and the League of United Latin American Citizens National Convention and Exposition for marketing and outreach to potential applicants. Outreach events have generated more than 200 applicants, Walters said.

The SEP was established to address and enhance the employment and advancement of minorities, women and people with disabilities on a non-discrimination basis, by ensuring they are afforded an equal opportunity in every personnel management policy and practice, explained Tora Henry, ACC Equal Employment Opportunity specialist.

More information about the Pathways program and ACC civilian career opportunities is available on ArmyHire.com, an ACC-managed website.

Headquartered at Redstone Arsenal, Alabama, the U.S. Army Contracting Command (ACC) and its subordinate organizations and contracting centers provide contracting support for the U.S. Army. As the Army's principal buying agent, ACC ensures that Soldiers have what they need to be successful, from food and clothing to bullets and bombs. ACC is a major subordinate command of U.S. Army Materiel Command.

AMMO EXPERTS PROVIDE SPECIALIZED SUPPORT FOR THE FUTURE FORCE

By Tony Lopez, JMC Public Affairs

More than 330,000 Department of the Army Civilians work in every profession imaginable and serve as an integral part of the Army team. These men and women are not active duty military, but support the defense of the nation.

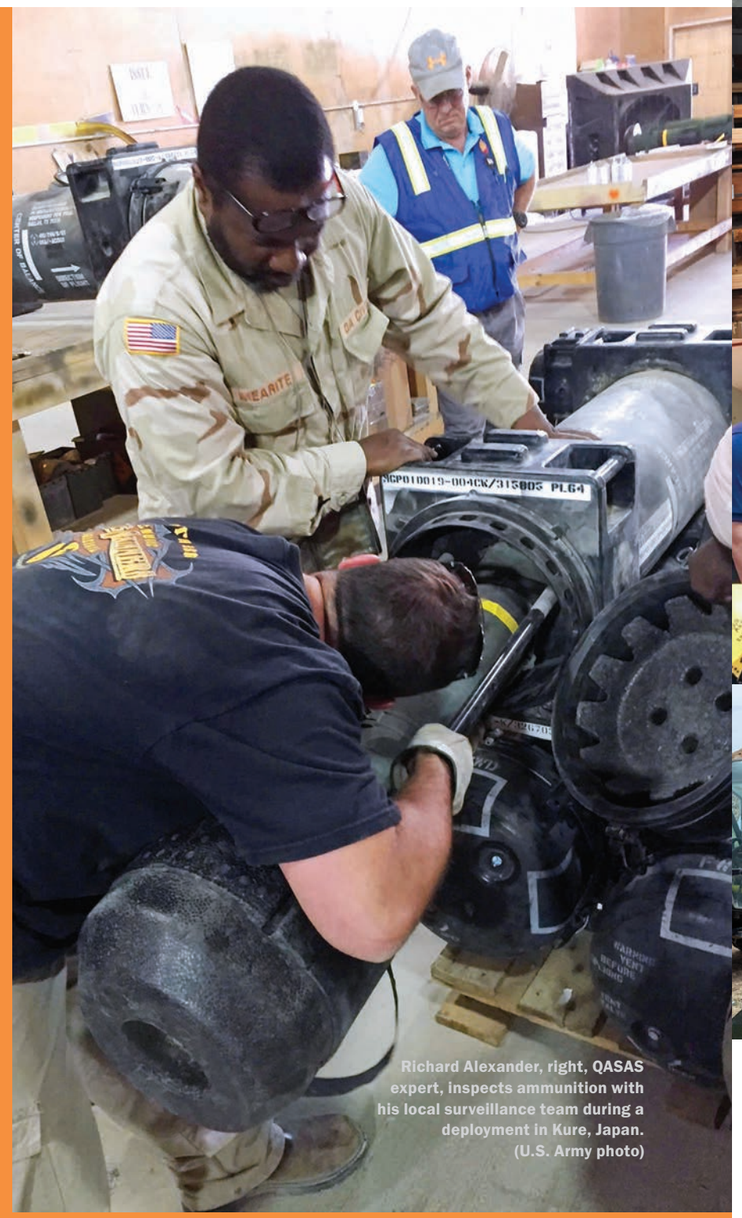
Today, the U.S. Army offers a variety of career programs for civilians, but it all started with a single program over 95 years ago – the Quality Assurance Specialist Ammunition Surveillance (QASAS). QASAS, now Career Program 20, was established on March 22, 1920, making it the oldest federal civilian career program in existence.

While the program has evolved and developed over the years, one fact remains – wherever American service members are deployed, QASAS employees go to provide ammunition support. Currently, QASAS are deployed to Afghanistan, Iraq and Kuwait in support of ongoing contingency missions.

QASAS employees conduct inspections, tests and studies to assess serviceability or deterioration of munitions. They inspect and monitor ammunition and explosives operations and facilities for regulatory compliance and develop, analyze and apply information about design, production, modification, disposal and reliability of munitions.

Their responsibilities also include establishing procedures to ensure ammunition is safe for storage, handling and use; performing inspections on all Class V materials; performing and assisting with explosives safety surveys, mishap and malfunction; and maintaining a database on the serviceability/readiness and suspension/restriction status of the ammunition stockpile.

"Because ammunition is a complex, inherently hazardous and a critically important commodity to the national defense, QASAS personnel must be highly motivated and knowledgeable of ammunition's unique properties, characteristics and requirements," said Tom Enricco, chief of the Ammunition Civilian Career Management Office. "The comprehensive training QASAS undergo prepares them to perform ammunition surveillance functions, which enhance the quality, reliability, safety and efficiency of the ammunition mission in support of Army readiness."



Richard Alexander, right, QASAS expert, inspects ammunition with his local surveillance team during a deployment in Kure, Japan. (U.S. Army photo)

FROM TOP: QASAS expert Willie Morrisey performs an ammunition inspection in Vilseck, Germany.

QASAS expert Clinton Abram supports port ammunition operations at the port in Nordenham, Germany.

James Mearite, QASAS expert, inspects ammunition during a surveillance turn-in at Ammunition Supply Point at Bagram Airfield, Afghanistan. (U.S. Army photos)

Theresa Smith, JMC senior command representative to the 401st Army Field Support Brigade, James "Zeke" Zaleski, chief of surveillance for QASAS, and Rick Vice, JMC senior systems technical representative, QASAS, sort through some of the more than 120,050 ammunition and explosive items at Bagram Airfield. (U.S. Army photo by Summer Barkley)

Joint Munitions Command (JMC) operates a nationwide network of conventional ammunition manufacturing plants and storage depots, and provides on-site ammunition experts to U.S. combat units wherever they are stationed or deployed. A subordinate command of U.S. Army Materiel Command, JMC provides for customers from U.S. forces of all military services, other U.S. government agencies and allied nations.

A RICH HISTORY

The career program was established at the U.S. Army Defense Ammunition Center and School (USADACS), originally located at Savanna Army Depot in Illinois. Following reorganization in 1971, the Center and School officially merged under what is now AMC. In 1994, USADACS became the Defense Ammunition Center (DAC). In 1998, DAC relocated to McAlester Army Ammunition Plant, and now reports to the deputy to the commander of JMC.

Wherever the Army has gone, QASAS employees have followed to support the Army's mission. They have deployed with the Army in World War II, Korea, Vietnam, various conflicts in the Middle East and in smaller conflicts and humanitarian assistance efforts like Grenada, Panama and Somalia.

The career program has grown and diversified during its rich history. The first African-American inspectors joined the program in the summer of 1941, and the first female inspectors followed soon after in September 1942. Shortly after women joined the field, "Abby the Ammunition Inspector" became a common sight in ordnance establishments throughout the country.

Career accession for QASAS employees takes place exclusively through an intern program, consisting of one year of in-class training followed by one year of on-the-job training. Interns enter the program as General Schedule-07. After successfully completing classroom training, they are promoted to GS-09, and at the end of their hands-on training, are promoted to GS-11. Promotions beyond GS-11 are competitive, and careerists are selected for promotions based on the rating and ranking lists, developed at least annually, by the QASAS career program screening panel.

The QASAS program is a mandatory-mobility, Department of the Army program, centrally managed by U.S. Army Materiel Command (AMC) via the Joint Munitions Command (JMC) Ammunition Civilian Career Management Office at McAlester, Oklahoma.

Looking to the future, the QASAS' strategic vision is to provide the most highly trained, experienced and technically competent workforce in support of commanders worldwide, assuring the quality and safety of the Department of Defense's ammunition stockpile – from cradle to grave – during peacetime, wartime and operations other than war. The QASAS career program will continue to provide "face to the field" ammunition experts as future interns graduate and are sent to support Soldiers wherever they are needed.

BATTLE TECH

MATERIEL READINESS FOR TOMORROW'S WARFIGHTER

AMC experts have developed game-changing technology to provide the decisive edge to today's forces and ensure the Army's advantage well into the future. BattleTech provides a look at some of the amazing technology being used in the command today.

ENHANCED TACTICAL MULTI-PURPOSE HAND GRENADE

Engineers with the U.S. Army Armament Research, Development and Engineering Center (ARDEC) at Picatinny Arsenal, New Jersey, are working to develop the Enhanced Tactical Multi-Purpose (ET-MP) hand grenade, the first new lethal hand grenade in more than 40 years. The multi-purpose hand grenade will provide fragmentation and blast overpressure more effectively and safely than its legacy counterparts. Once fielded, Soldiers will be able to select and use a hand grenade with different effects simply by flipping a switch. For the past five years, engineers at Picatinny have been working with Infantry School representatives, hand grenade cadre and active duty Soldiers and Marines to determine warfighter needs. This is the first hand grenade that can be tailored for the mission, said Jessica Perciballi, ARDEC project officer for the ET-MP. "With the new multi-purpose grenade, they can carry one ET-MP grenade and have the ability to choose either fragmentation or concussive effects desired for the situation," she said.

An infantryman assigned to 2nd Cavalry Regiment prepares to throw a training hand grenade, during the 173rd Airborne Brigade's Expert Infantryman Badge training phase at the 7th Army Training Command's Grafenwoehr Training Area in Germany. (U.S. Army photo by Spc. Nathanael Mercado)

HYDROGEN FUEL CELL-POWERED TRUCK

The U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) and General Motors unveiled the Chevrolet Colorado ZH2 hydrogen fuel cell-powered truck in Washington, D.C., during the 2016 Association of the United States Army Annual Meeting and Exposition. The vehicle features an exportable power-take-off unit that allows the fuel cell to power activity away from the vehicle. The vehicle, which was developed under a 2015 agreement between the two organizations, allowed TARDEC to access consumer-driven technology for use in military applications while providing GM with feedback on non-standard fuel cell technology applications. Developers intend to conduct user assessment and demonstration in 2017 for near-silent operations, reduction of acoustic and thermal signatures, high wheel torque at all speeds via the electric drive, low fuel consumption across operating ranges, and water by-product for field uses. "Fuel cells have the potential to expand the capabilities of Army vehicles significantly through quiet operation, exportable power and solid torque performance, all advances that drove us to investigate this technology further," said Dr. Paul Rogers, TARDEC director.

(Photo courtesy of General Motors)

US-UK SCIENTIST EXCHANGE PROGRAM PORTON MAN SYSTEM

Through the U.S. Army Engineer and Scientist Exchange Program, American and British researchers are combining their knowledge at the United Kingdom's Defence Science and Technology Laboratory, known as Dstl, to test chemical-protection fabrics and materials. Dr. Terrence D'Onofrio, a research chemist from the U.S. Army Edgewood Chemical Biological Center, is a member of the Army's exchange program, working at Dstl on the Porton Man system. "Dstl is the only place in the world where they can dress the mannequin with an ensemble – including suit, respirator, boots, gloves, body armor – and have it exposed to the actual agent to find out how well it performs as a whole," he said. Porton Man enables system-level research and testing of chemical-protective ensembles. Instead of the typical research method of testing full suits with simulants, Dstl's facility and capabilities allow scientists to use real chemical agents. "Our goal is to get all the data to work together to answer the question, 'Is this suit going to protect our forces and let them complete their mission?'" said D'Onofrio.

Dr. Terrence D'Onofrio, a U.S. Army research chemist with the U.S. Army Edgewood Chemical Biological Center, works with the Porton Man, which enables system-level research and testing of chemical-protective ensembles. (U.S. Army photo)

SOLID STATE ACTIVE DENIAL TECHNOLOGY

Engineers with the U.S. Army Armament Research, Development and Engineering Center (ARDEC) at Picatinny Arsenal, New Jersey, are developing technology for non-lethal crowd control designed to help protect Soldiers while minimizing collateral damage and preventing any permanent physical harm. Researchers believe that the Solid State Active Denial Technology (SS-ADT) is highly promising for crowd dispersal, checkpoint security, perimeter security and port protection from both mobile and fixed site applications. SS-ADT is a directed energy weapon that uses radio frequency, millimeter waves at 95 GHz traveling at the speed of light to create a brief intolerable heating sensation on the person's skin at tactically useful ranges. Minimal risk of injury exists due to the shallow energy penetration, resulting in only about 1/64th of an inch into the skin. The effects begin instantaneously, causing the skin to heat quickly, reaching an intolerable effect level and forcing a response such as a flinch or flee. "The work over the last few years resulted in a working prototype that is planned for use in Military Utility Assessments," said Thomas Shadis, chief of the Directed Energy and Non-Lethal Branch at ARDEC.

Soldiers from the 1st Battalion, 41st Infantry Regiment, 2nd Infantry Brigade Combat Team, train in crowd control techniques during a recent exercise. (U.S. Army photo by Staff Sgt. Thomas Duval)

A BRIGHT FUTURE:
THE POSITIVE IMPACT OF ARMY STEM INITIATIVES

By Matt December, AMC Today contributor

For more than 50 years, the U.S. Army has worked to provide students with expanded opportunities in science, technology, engineering and mathematics (STEM) education.

The Army's STEM education and outreach activities, managed by the U.S. Army Research, Development and Engineering Command (RDECOM) on behalf of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)), provide a broad-reaching impact on STEM literacy across the nation. The unique assets found throughout the U.S. Army Materiel Command (AMC), the U.S. Army Medical Command (MEDCOM), the U.S. Army Corps of Engineers (USACE), and many other Army organizations play a key role in that endeavor.

"The Army's scientists and engineers who work in our laboratories and research facilities are able to show students and teachers the many applications of STEM education," said Louie Lopez, chief of STEM Education and Outreach at RDECOM.

As home to the Army's largest collection of scientists and engineers, AMC and RDECOM collaborate with academia, industry, not-for-profit organizations, other federal agencies and their partners throughout the Army to provide a variety of educational opportunities ranging from enrichment activities and competitions to research apprenticeships.

While many Army research centers and labs still maintain STEM efforts at the local level, more than a decade ago, ASA(ALT) brought together many of the Army's sustained STEM activities under the umbrella of the Army Educational Outreach Program (AEOP).

"They looked at all these continued activities for kindergarten through undergrad and wanted to ensure that the Army, through AEOP, was able to provide a continuum of meaningful STEM experiences at whatever grade level to continue to enhance STEM learning," said Lopez, who also acts as the AEOP Cooperative Agreement manager at RDECOM.

RIGHT: Students attend a STEM event hosted by the U.S. Army research community at the Walter E. Washington Convention Center in Washington, D.C.

BELOW LEFT: Aspiring scientists and engineers crowd the Washington Convention Center for a chance to see and touch the future of American technology. The U.S. Army research community set up displays to demonstrate to students how it empowers Soldiers through technology such as night-vision technology, tele-operations of robotic systems, and high-speed ballistics photography. (U.S. Army photos)

In 2015, AEOP saw more than 38,000 youth participants across 10 different activities. These include:

- Enrichment activities that focus on engaging and exciting experiences, typically targeted at underserved students and those in early grades;
- Competitions that expose students to scientific and engineering research methods using both hands-on and virtual activities;
- Apprenticeship opportunities at Army research and development centers, and at the Army's partners in academia, giving students first-hand experiences working for the U.S. Army;
- Scholarships and awards for students wishing to pursue further STEM education.

AEOP's largest STEM competition, with more than 27,000 student participants last year, is eCYBERMISSION. As an Army-sponsored, web-based STEM competition for students in grades six through nine, eCYBERMISSION challenges teams of three or four students to identify a problem in their community and implement a solution using best practices in scientific inquiry and engineering design.

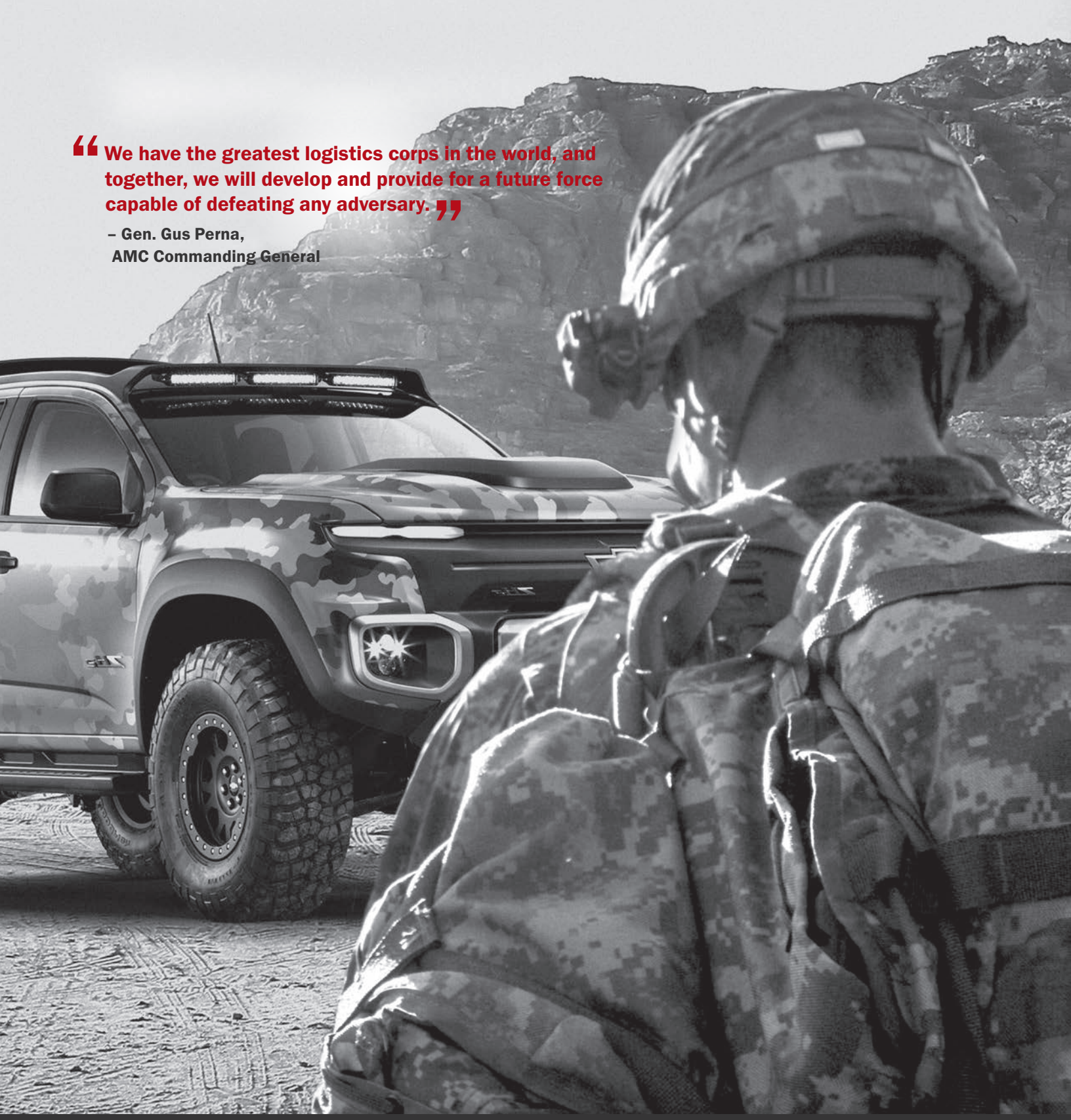
While students across the country have shown continued interest in STEM, Army and DOD scientists and engineers have shared their passion for the program, with more than 1,400 volunteering for AEOP activities in 2015.

"What's unique about the Army's contribution to STEM is the strength of our scientific and technical workforce, and our world-class research facilities," said Lopez. "When the Army's scientists and engineers talk to students and teachers, the conversation is about what the Army does in the world of science and technology. They can talk to them about the great things that happen at AMC's RDECOM, or MEDCOM or USACE, with topics ranging from cutting edge medical research, to civil, construction and environmental engineering, to materiel sciences or in the realm of cyber and nanotechnology, just to name a few."

The Army's efforts in AEOP aim to enhance STEM literacy in broader terms, highlighting the importance of research to not only enable the Soldier, but also create technologies to transition for commercial and general public use, Lopez said.

"Our goal is to continue to help develop young talent and have a great foundation in STEM – people who will one day help solve the complex problems of the future," he said. "Whether that ends up with them working for AMC, RDECOM, MEDCOM, the Corps of Engineers, or even if it is working with our partners in academia or industry, they are still a part of our ecosystem that is critical to developing future capabilities."

AEOP is always seeking volunteers and supporters from around the Army, industry and academia, Lopez said. For more information on AEOP programs, or on how to get involved, visit www.usaeop.com.



4400 MARTIN ROAD, REDSTONE ARSENAL, AL 35898

WWW.ARMY.MIL/AMC

https://www.facebook.com/ArmyMaterielCommand

https://www.flickr.com/photos/ArmyMaterielCommand

https://www.youtube.com/user/HQAMC

https://twitter.com/HQAMC