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JULY–AUGUST 2017

ARMY SUSTAINMENT

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Joint Logistics

Connecting the Dots

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PB 700–17–04 Headquarters, Department of the Army • Approved for public release; distribution is unlimited.

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Soldiers attached to the 331st Transportation Company and Marines attached to the 3rd Transport Support Battalion transfer cargo on the Army trident pier on April 13, 2017, during Operation Pacific Reach 2017. (Photo by Petty Officer 2nd Class Eric Chan)

"The joint force is better served and, more importantly, more ready when the Army can synchronize force projection to deploy our forces effectively, efficiently, and quickly."

Gen. Gustave "Gus" Perna, p. 2

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Providing Materiel Readiness on a Joint Battlefield

■ By Gen. Gustave "Gus" Perna

In this changing and complex world, the battlefield of tomorrow will be nothing like that of the past. Our armed forces will need to be prepared to fight across all domains to defeat our adversaries. The joint fight will require joint, expeditionary logistics to support it, and the Army's materiel enterprise must be ready to respond.

In the May–June 2017 issue of *Army Sustainment*, I introduced six strategic objectives that establish the organizational strategy to operationalize the Army Materiel Command (AMC) as the Army's materiel integrator: materiel readiness, Sustainable Readiness, force projection, battlefield sustainment, materiel development, and Armywide sustainment. This edition, focused on joint logistics, provides a fitting platform to highlight force projection and battlefield sustainment.

Force Projection

The U.S. military's strategic advantage is, in part, its ability to overcome the logistics difficulties inherent in projecting forces forward. With its strategic partners in the Forces Command, which organizes forces for deployment, and the U.S. Transportation Command, which coordinates and provides the means for the movement of joint forces, AMC sets the conditions for force projection, from power projection platforms to forward operating locations.

The joint force is better served and, more importantly, more ready when the Army can synchronize force projection to deploy our forces effectively, efficiently, and quickly. Installation logistics readiness centers (LRCs) manage that projection and provide the critical link.

We must optimize LRCs by establishing baseline service support requirements, such as equipment maintenance, ammunition management, food service operations, and supply support activities, and by prioritizing resources for those requirements. LRCs must be able to properly support installations while simultaneously meeting force projection timelines and standards.

Force projection also entails Army pre-positioned stocks that are configured to strengthen national defense and build capacity. Combatant commanders and the joint force rely on equipment sets that are regionally aligned in support of an expeditionary force for training and contingency operations. Pre-positioned stocks must be ready, modern, and configured for combat to ensure rapid and capable land power.

Battlefield Sustainment

Battlefield sustainment requires regional alignment with the force in order to deliver sustainment rapidly to the point of need. To achieve this, sustainers must streamline contracting business processes, organizational structures, readiness, and workforce capabilities to provide contracting support that anticipates rather than reacts to requirements.

Effective mission command enables AMC to optimize battlefield sustainment and solidify a single "face to the field" through the Army Sustainment Command. This mission-command alignment increases responsiveness to the battlefield sustainment needs and requirements of the joint force.

Another initiative under battlefield sustainment is building partner capacity through security assistance programs. The Army must ensure its security assistance efforts provide the right equipment and services to partner nations in order to meet combatant command requirements.

Through foreign military sales, the Department of Defense offers its partners materiel, spare parts, training, publications, technical documentation, maintenance support, and other services to ensure battlefield sustainment. Being strategic and proactive in security assistance increases the effectiveness of efforts supporting theater security cooperation plans.

As the Army prepares to equip and sustain Soldiers today and in the future under the Multi-Domain Battle concept, we must think jointly. The military relies on the logistics proficiency of our Army. We must develop and deliver capabilities that operate across the joint force and partner nations. Getting force projection and battlefield sustainment right is critical to successful joint logistics.

Gen. Gustave "Gus" Perna is the commander of AMC at Redstone Arsenal, Alabama.

Connecting the Dots

Soldiers and Army civilians must appreciate what the other services can provide in order to connect the dots and get the best solution.

■ By Lt. Gen. Aundre F. Piggee

Here is a quick pop quiz to get my fellow sustainers thinking about joint operations:

1. Vitally important Army prepositioned stocks are afloat around the world on ships built for the Navy. Who crews the ships?
2. Of the $50 billion worth of munitions the Army stockpiles, what portion is for the Air Force, Navy, and Marine Corps?
3. Of the equipment that the Army's five maintenance depots work on, what percent is for our sister services?

Here are the answers:

1. Merchant mariners.
2. About one-third.
3. Thirteen percent.

If you answered the questions correctly, congratulations. But if you were stumped by some of them, you are not alone. Not enough Soldiers and Army civilians have worked with our sister services and can appreciate that we are part of a much larger and integrated joint supply chain.

Connecting the Dots

If you do not have that broad perspective for what other services can do for us, or what we can do for them, you end up with stovepiped solutions rather than using every available source and connecting the dots to get the best solution.

I learned that lesson from my joint experience as the J-4 at the U.S. Central Command and, before that, at U.S. Forces Korea. Our major concern was setting the theater.

We had munitions, but we did not have them in the right locations, and we did not have the right types in stock. Fuel was another major issue. We could get fuel from the Defense Logistics Agency, but getting it to the port, to the forward location, or to the foxhole was always challenging.

In order to be able to facilitate the quick movement of adequate forces from ports, we needed early-entry forces to move quickly, to receive their equipment, and to be integrated for onward movement. We had many dots to thread together to make it all work.

This experience convinced me that if we had to fight in major operations today, starting in an expeditionary manner, we would be challenged to have the right equipment, munitions, and supply stocks in the right place at the right time. As the Army G-4, I have turned these concerns into my top policy priorities.

The Organic Industrial Base

First and foremost, the Army is working to ensure that its organic industrial base—the plants, depots, and arsenals—are viable and producing combat readiness. We have relied on them to reset nearly 4 million pieces of equipment used during operations in Iraq and Afghanistan.

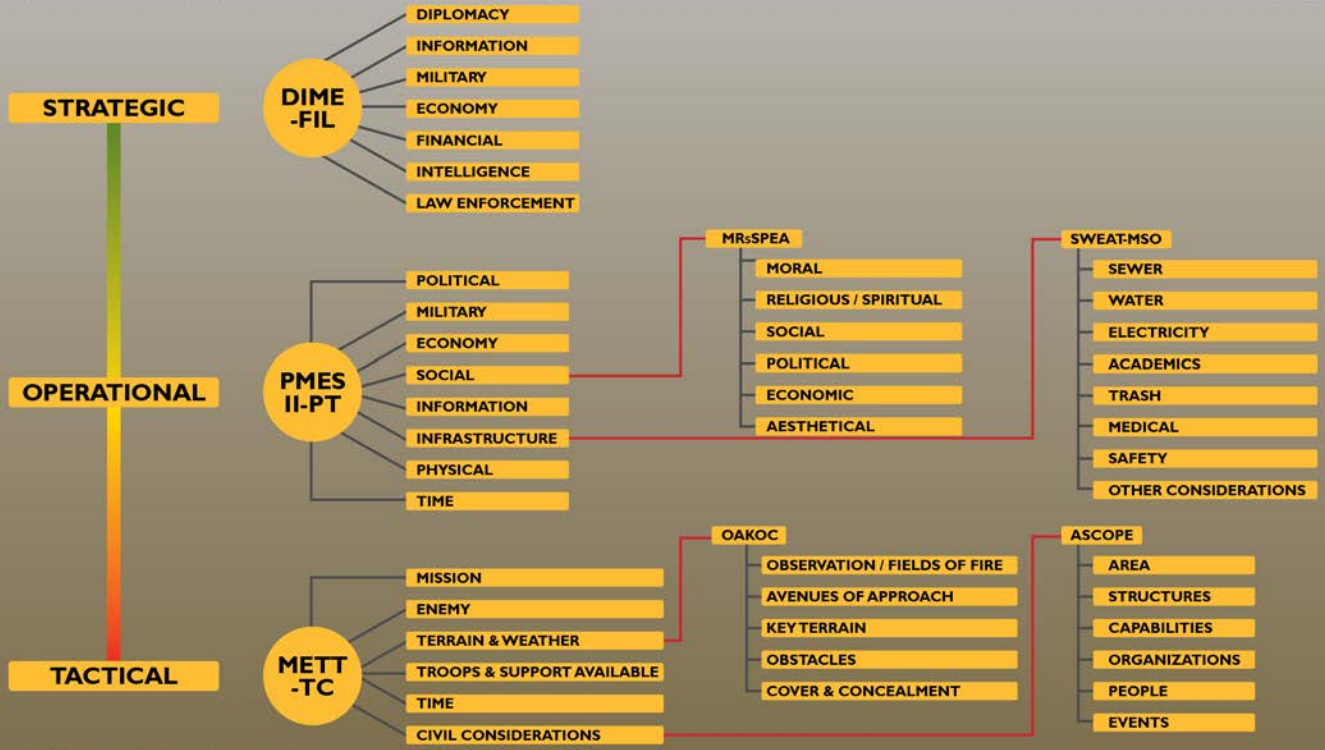
In addition to their work for the Army, the depots maintain the Marine Corps' mine-resistant ambush-protected vehicles, M1A1 Abrams tanks, and radar sets. They also

"Not enough Soldiers and Army civilians have worked with our sister services and can appreciate that we are part of a much larger and integrated joint supply chain."

HIP-POCKET GUIDE

JOINT MISSION ANALYSIS PLANNING CONSIDERATIONS

A U.S. ARMY LOGISTICS, G-4 PRODUCT



SOURCE: MAY-JUN 2016 | Military Review

HIP-POCKET GUIDE

JOINT OPERATIONS PLANNING PROCESS

A U.S. ARMY LOGISTICS, G-4 PRODUCT

STEP 1 - Initiation

STEP 2 - Mission Analysis

KEY INPUTS

- Higher headquarters' planning directive
- Other strategic guidance
- Commander's planning guidance
  - Description of the operational environment
  - Definition of the problem
  - Commander's operational approach
  - Commander's initial intent

KEY OUTPUTS

- Staff estimates
- Mission statement
- Commander's refined operational approach including:
  - Joint force commander's (JFC's) intent statement
  - JFC's updated planning guidance
  - Commander's critical information requirements

STEP 3 - Course of Action (COA) Development

KEY INPUTS

- Staff estimates
- Mission statement
- Commander's refined operational approach including:
  - Joint force commander's (JFC's) intent statement
  - JFC's updated planning guidance
  - Commander's critical information requirements

KEY OUTPUTS

- Revised staff estimates
- COA alternatives with concept narrative and sketch including:
  - Objectives
  - Key tasks
  - Major capabilities required
  - Task organization
  - Main and supporting efforts
  - Deployment concept
  - Sustainment concept
  - Information operations support themes
  - Identification of reserve
  - Identification of required supporting interagency tasks

STEP 4 - Course of Action (COA) Analysis

KEY INPUTS

- Revised staff estimates
- COA alternatives with concept narrative and sketch including:
  - Objectives
  - Key tasks
  - Major capabilities required
  - Task organization
  - Main and supporting efforts
  - Deployment concept
  - Sustainment concept
  - Information operations support themes
  - Identification of reserve
  - Identification of required supporting interagency tasks

KEY OUTPUTS

- Potential decision point
- Evaluation criteria
- Potential branches and sequels
- Refined COAs
- Revised staff estimates

STEP 5 - Course of Action (COA) Comparison

KEY INPUTS

- Advantages and disadvantages
- Wargaming results
- Evaluation criteria
- Revised staff estimates

KEY OUTPUTS

- Evaluated COAs
- Recommended COA
- COA selection rationale
- Revised staff estimates
- Refined commander's critical information requirements

STEP 6 - Course of Action (COA) Approval

KEY INPUTS

- Refined COAs
- Staff recommendation
- JFC's personal analysis (experience & judgment)

KEY OUTPUTS

- COA modifications
- JFC's COA selection
- Commander's estimate (if required)
- Refined commander's intent

STEP 7 - Plan or Order Development

SOURCE: Joint Publication 5-0 | Joint Operation Planning | 11AUG2011

The Army's depots maintain vehicles, aircraft, and other combat systems belonging to the other services.

maintain the Air Force's Pave Hawk helicopters and firefinder weapon locating systems, among others.

The Army must be able to rely on its organic industrial base in case it deploys to a contingency operation and needs to surge to meet the demands of war.

Munitions Stocks

Second, the Army is working to grow its munitions supplies. We have adequate stocks for today's known requirements. But if we had to conduct two contingency operations simultaneously, I would be concerned that we would not have adequate munitions to execute those operations.

So, we are working to procure more munitions for future operations and to validate and extend the life of our current munitions.

Pre-positioned Stocks

Third, the readiness of Army pre-positioned stocks around the world continues to improve, but we have more work to do.

We are replacing equipment that we consumed during operations in Afghanistan and Iraq. We are reassessing our European stocks to assure our allies and deter Russian aggression.

We are planning to configure equipment in ready-to-fight unit sets. Doing this will significantly reduce the time required for reception, staging, onward movement, and integration.

Technology

Fourth, we need to do a much better job of using technology and putting capabilities in the hands of Soldiers. One of the things I am demanding from my staff is that they take advantage of current technology and not depend on something that is not here yet.

Let me use smartphones as an example. When a smartphone app needs to be updated, the user simply presses a button and the app automatically updates. But some Army systems require a cumbersome, multistep process in order to receive updates.

If a smartphone can be updated in a matter of minutes and never lose capability, why are we not taking full advantage of this kind of technology for our systems?

If an existing technology can improve Army readiness, we need to procure, proliferate, and field that equipment to our forces as soon as it is available.

Our progress in each of these priorities will have a significant impact not only on Army readiness but also on the readiness of all armed forces. I saw this firsthand this spring when I visited Europe as the Army was conducting brigade-level exercises in Poland.

The Army, with its allies and sister services, was participating in the exercises as part of the European Reassurance Initiative. It was the first time since Exercise Reforger during the Cold War that Soldiers deployed to an expeditionary environment over such a long distance on short notice with their home-station equipment.

I witnessed highly motivated Soldiers from the 3rd Brigade, 4th Infantry Division, and the 68th Combat Sustainment Support Battalion, 4th Infantry Division, executing operations at a very high level. They had to use Polish facilities. They had to build warehouses from scratch. They had maintenance challenges. They had to reach back to Europe and in some cases back to the continental United States to get resupplied.

What was most impressive was that they were able to maintain high operational readiness rates for all of their ground fleets. Through it all, the Soldiers learned basic principles of executing sustainment operations in an expeditionary environment.

They may not know it now, but they also built personal friendships and professional partnerships that may pay forward in immeasurable ways when they need each other's help on a battlefield one day. Keep connecting those dots!

Lt. Gen. Aundre F. Piggee is the Army deputy chief of staff, G-4. He oversees policies and procedures used by all Army logisticians throughout the world.

Multiservice Integrated Training in the Army Institutional Domain

■ By Maj. Gen. Darrell K. Williams and Lt. Col. David L. Thompson

Across the spectrum of Soldier and leader development, the Army's institutional domain continues to evolve as a key link in education, training, and experience. The Army's ability to build forces capable of conducting unified land operations is strengthened by operating and training with joint, interagency, intergovernmental, and multinational partners.

CASCOM's Multiservice Training

At the Combined Arms Support Command (CASCOM) and Sustainment Center of Excellence, more than 113,000 personnel from all services are trained and educated on critical sustainment skills every year. The command spearheads training and education across five Army branches covering 57 military occupational specialties and 18 critical functional specialties.

Having multiservice integrated training within the Army institutional domain means that Army, Navy, Marine Corps, and Air Force personnel train under a single program of instruction. Most of the training is conducted at Fort Lee, Virginia, and Fort Jackson, South Carolina. However, the training touches more than 78 different sites across the continental United States and overseas.

Exposure to sister services creates unique Soldier and leader development opportunities not seen in most Army institutional environments. These educational experiences create shared professional understanding as Soldiers, Sailors, Marines, and Airmen progress to higher levels.

For Army sustainers, the institutional domain includes CASCOM, the sustainment schools, sustainment learning materials from other schools across the Army, and other Department of Defense training institutions. These institutions provide initial training and subsequent functional courses and integrate multiple services into the Army's institutional domain.

Institutional Training

CASCOM trains more than 11,000 students from services other than the Army and 500 international students each year. Following the co-location of the Ordnance, Quartermaster, and Transportation schools at Fort Lee, the installation experienced an influx of multiservice students. This effort created numerous efficiencies and established multiple joint institutional training organizations.

Fort Lee became the home of three joint centers: the Joint Culinary Arts Center of Excellence, the Joint Mortuary Affairs Center, and a consolidated transportation management element. The other services established training detachments to align instructor and mission command capabilities in support of these efforts.

The Marine Corps Detachment Fort Lee, for example, provides training in 11 specialties with 180 staff members and 2,500 students annually. The training audience includes entry-level Marines through officers.

The training involves personnel retrieval and processing (mortuary affairs), airborne operations and air delivery (parachute rigging), bulk fuel, food services, maintenance, and ammunition handling. The detachment also serves as the proponent for those specialties across the Marine Corps. The detachment writes and updates Marine Corps, joint, and multiservice doctrine.

Schools under the Sustainment Center of Excellence train personnel from all of the military services on critical sustainment functions.

Joint Culinary Training

The Army and Marine Corps have trained their food service students together at Fort Lee since 1999. The Navy and Air Force culinary training programs relocated to Fort Lee in 2010. The Joint Culinary Center of Excellence's Joint Culinary Training Center is the focal point for all entry-level and advanced food services training for all branches of the armed forces.

Although food service operations differ among the services, the core skills are the same for all food service personnel. Joint classes cover the core skills, and the services provide service-specific skills training and education during follow-on phases.

The Army's Culinary Specialist Course is the foundation for the first phase. This phase focuses on cooking, baking, and garrison and field operations and has an average annual student load of 2,500 Soldiers, 450 Marines, and 1,150 Sailors. The Air Force, while co-located at the Joint Culinary Center of Excellence, does not participate in this consolidated training with the other services.

The Advanced Culinary Skills Training Course is a fully joint course with students from all services and the Coast Guard. This single program of instruction includes multiservice instructors, which makes it a truly joint institutional training environment. This highly specialized course trains about 100 students per year, with the Army comprising 40 percent of the student population and the Navy comprising 30 percent.

The Joint Culinary Center of Excellence's Enlisted Aide Training Course has just under 100 students per year and is attended by Army, Marine Corps, Navy, and Coast Guard personnel. Air Force students will begin attending in fiscal year 2018.

The Military Culinary Arts Competitive Training Event has been conducted annually since 1973 and is spearheaded by the Joint Culinary Center of Excellence. It provides a unique venue for military chefs around the world to compete.

Personnel from the Army, Navy, Marine Corps, Air Force, Coast Guard, and foreign countries' armed services all participate in the competition. In 2017, 240 military personnel competed on 25 teams from the U.S. military branches, France, Germany, and Great Britain. Winners go on to compete in the American Culinary Federation competition held each summer.

Joint Mortuary Affairs

The Quartermaster Center and School is the proponent for joint mortuary affairs. It provides continual, sustainable, global mortuary affairs support for the Department of Defense.

All mortuary affairs training and doctrine development are conducted at the Joint Mortuary Affairs Center (JMAC), which serves as a center of excellence. It also serves as the Department of Defense mortuary affairs training and doctrine integration center for all services and trains more than 250 military personnel annually. The center trains and certifies mortuary affairs specialists for both the Army and Marine Corps.

The Navy also sends students to the JMAC to support the joint mission at Camp Lemonnier, Djibouti. The Marine Corps has the only non-Army mortuary affairs company, and all of its personnel complete institutional training at JMAC. Multiservice students historically represent 10 to 15 percent of the JMAC's training population.

Petroleum and Water

The Quartermaster School's Petroleum and Water Department conducts three enlisted advanced individual training courses and a single officer course. Each course regularly consists of students from across all services and has an average student load of more than 550 non-Army personnel per year.

The Petroleum Laboratory Specialist Course provides training to just under 500 students per fiscal year. Army students make up nearly 70 percent of the training mission while Airmen and Marines comprise the other 30 percent.

These students learn about petroleum quality surveillance requirements and compliance. This encompasses training on inspections, sampling, testing, quantity measurement, control, and documentation to monitor the quality and quantity of fuels being received, stored, and issued within the supply chain.

Lasting just over 10 weeks, the Petroleum Supply Specialist Course applies more than 75 percent of its curriculum to hands-on training for Army and Marine Corps students. While the Navy does send students, the course does not produce a certified occupational specialty for Sailors.

The course creates a common framework for petroleum supply operations, environmental standards, gauging and sampling, aircraft refueling, pipeline operations, and the Marine Corps bulk fuel system.

The Petroleum and Water Officer Course trains Soldiers, Marines, and Sailors. Infrequently, Air Force officers or noncommissioned officers attend. The course, which produces an additional skill identifier for Army officers, trains more than 50 students per year. It provides students with the skills and knowledge to perform petroleum and water logistics management duties for both staff and supervisory operational assignments.

Aerial Delivery and Field Services

The Aerial Delivery and Field Services Department graduates on average more than 150 multiservice students per year from the Parachute Rigger Course. The Air Force alone had 84 personnel graduate from the course in 2016. Marines at Fort Lee also complete the Multi-Mission Parachute System Course.

The department develops airdrop, rigging, and sling-load doctrine in addition to all training support materials.

Maintenance

The Army Ordnance Corps and School at Fort Lee trains more than 20 mechanical maintenance specialties. The school provides current and relevant training to build technical skills and confidence for maintenance operations. The Armament and Electronics Maintenance Department and the Track Metalworking and Recovery Department train both Army and Marine Corps students.

While individual Soldiers and Marines are responsible for the upkeep of their own weapons, small-arms and artillery repairers perform field and sustainment levels of maintenance on weapons and towed artillery. The Smalls Arms and Artillery Repairer Course teaches students to diagnose, troubleshoot, and repair malfunctions. The course graduates more than 360 Marines each year.

Fire control is a precise science that enables tanks to have a first-shot capability. The Fire Control Repairer Course trains nearly 130 Marines each year on laser range finding, diagnostic test sets, fire control devices for towed artillery, and infrared observation devices.

When Army and Marine Corps units need a part repaired or fabricated immediately, an allied trades specialist is an invaluable asset. The Allied Trades Specialist Course trains more than 130 students each year to operate metalworking machinery such as drill presses and grinders.

The students also master the use of oxygen-acetylene, metal inert gas, and tungsten inert gas welding equipment as well as arc and air arc cutting and gouging equipment. Allied trades specialists maintain the high standards of precision necessary to fabricate virtually anything combat forces require.

Munitions and Explosives

Annually, more than 360 Marines share classrooms and field training experiences with Army students at the Ordnance School's Ammunition Specialist Course. They learn ammunition and explosives management through aggressive training on receiving, storing, and issuing conventional ammunition, guided missiles, large rockets, and explosives. They also learn to operate materials handling equipment that is used on the battlefield.

Explosive ordnance disposal training is balanced between the Army Ordnance School and the Naval School Explosive Ordnance Disposal. Soldiers complete a rigorous Phase 1 of the course at Fort Lee before attending Phase 2 at Eglin Air Force Base, Florida. The course trains approximately 1,800 military personnel each year.

The Defense Ammunition Center and the Army Technical Center for Explosives Safety provide all military services with both instructor-led and online training each year. The scope of training for more than 161,000 students per year covers ammunition training, explosives safety, and engineering.

The two-week Technical Transportation of Hazardous Materials Course is taught at locations all over the world. This course meets the mandatory certification requirements for military personnel involved in all aspects of transporting hazardous materials. It also covers regulations for hazardous materials transportation across all modes to include land, sea, and commercial and military air.

Postal Training

Led by a Marine Corps chief warrant officer and subordinate to the Army's Adjutant General School under the Soldier Support Institute, the Interservice Postal Training Activity trains Soldiers, Marines, and Airmen.

Two courses create the multiservice capability. The five-week Postal Operations Course trains students from pay grades E-1 through O-4 in basic postal skills and expands to go deep into mail processing and finance operations.

The Postal Supervisor Course, which lasts two weeks and four days, trains leaders to supervise postal operations in contingency operations and to manage the numerous responsibilities associated with military postal services.

Future Joint Training

The demands on sustainment leaders will continue to be challenging and complex in the future operational environment. The integration of joint sustainment functions, including maintenance, transportation, supply, field services, distribution, operational contract support, general engineering, human resources, financial management, health service support, and band operations, must be applied across the operational and institutional domains.

Future joint and multiservice training within the Army institutional domain must be characterized by a strong appreciation of joint combined arms maneuver, expeditionary sustainment, total force sustainment integration, strategic sustainment enterprise operations, and common sustainment information systems. Functional courses, such as the Joint Logistics Course and Joint Operational Contract Support Planning and Execution Course, will bridge capability and operational environment gaps.

Education provides intellectual constructs and principles. It develops individuals and leaders who can think, apply knowledge, and solve problems under uncertain or ambiguous conditions. As it becomes more jointly integrated, the Army institutional domain will incorporate deeper "how to think" methodologies and enhance multiservice commonalities in unknown and ambiguous environments.

Maj. Gen. Darrell K. Williams is the previous commanding general of CASCOM and the Sustainment Center of Excellence at Fort Lee, Virginia.

Lt. Col. David L. Thompson is the commander of the 832nd Ordnance Battalion at Fort Lee, Virginia. He is a graduate of the Advanced Military Studies Program.

Operational Contract Support Needs a Joint Force Focus

Personnel in every service should be trained and encouraged to understand the importance of operational contract support.

■ By Brig. Gen. Jeffrey A. Doll

Contracting provides forces with flexibility and is an effective way to reduce long-term costs. Reductions in military forces have driven the demand for the increased use of contracts to augment the force. Recent joint force experiences in Iraq and Afghanistan have demonstrated the requirement for contracts.

However, the Department of Defense (DOD) lacks the ability to leverage the full potential of operational contract support (OCS) because DOD personnel have insufficient awareness and appreciation for its significance and complexity.

What is OCS?

Joint Publication 4-10, Operational Contract Support, defines OCS as "the process of planning for and obtaining supplies, services, and construction from commercial sources in support of joint operations." OCS relies on three types of contracts: theater, external, and systems.

Theater contracts are issued by deployed forces for use during contingency operations. External contracts are issued by contracting agencies outside deployed theaters for broad force support. Systems contracts support major weapon systems or support systems.

Contracts support military forces in all types of operations. Contracts can span from days to years in duration, support joint formations or a single service, and be used during training and in support of deploying forces.

The application of OCS requires planning for contractor management, contract support, and contract integration. OCS is a critical part of joint operations. No major contingency operation has been conducted without OCS.

The Status of OCS

The application of OCS within the force has been studied extensively over the past several years. The driving factors for this analysis were the increased use of contracts in Operations Iraqi Freedom and Enduring Freedom and cases of mismanagement and fraud.

According to a congressionally chartered Commission on Wartime Contracting report from 2011, the total cost of fraud associated with contract support in Iraq and Afghanistan from 2001 to 2011 is estimated to be $30 billion. Fraud cases have driven the emphasis on planning and instruction of OCS fundamentals.

In a March 2012 report, the Government Accountability Office (GAO) noted several problems with OCS in the Afghanistan theater.

First, DOD contracting officer representatives were not adequately trained to effectively oversee contracts. The report stated that training did not address the complexity of the environment, which resulted in poor contractor performance.

Second, some service members had not received training on assigned OCS oversight duties, and commanders did not perceive OCS as a warfighting task.

GAO's examination of U.S. Africa Command (AFRICOM) noted structural issues that degraded the effectiveness of OCS within the command. In AFRICOM, only the Army had established a formal OCS structure with dedicated personnel; Navy, Marine Corps, and Air Force elements had no formalized structures.

The two primary reasons the services gave for not having formal OCS structures within AFRICOM's subordinate component commands were a lack of personnel and a lack of guidance. Without formal OCS structures, the services failed to emphasize the importance of OCS as an enabling operational process within the combatant commands.

The Combined Joint Task Force–Horn of Africa, a subordinate command of AFRICOM located at Camp Lemonnier, Djibouti, does not have a formalized OCS structure. Joint Publication 4-0, Joint Logistics, states that a formal structure should exist but is based on mission conditions.

A 2015 GAO report found that efficiencies were obtainable but only through the creation of an OCS integration cell within the joint task force. The lack of awareness and appreciation of OCS as a joint operational capability has produced inefficiencies within the DOD at large and within the Horn of Africa specifically.

OCS in Planning

However, a broad review of the implementation of OCS in DOD combatant commands showed that actions have been taken to address OCS as a core joint warfighting function. A 2013 GAO review of 95 contingency plans within the combatant commands found that 45 plans had an approved annex W, which is the OCS annex of major plans.

While this shows progress, it also demonstrates the failure to fully include OCS in the planning phases of major contingency operations. Additionally, contingency planning within combatant commands has focused exclusively on the logistics aspects of major planned operations. OCS requirements in other areas, such as communications, intelligence, and security, are still lacking within plans and planning processes.

The combatant commands have received assistance for OCS development from the Defense Logistics Agency's Joint Contingency Acquisition Support Office (JCASO). The JCASO planners are allocated to each combatant command and placed within the logistics staff element or J-4.

While this has been a positive step in developing OCS within the combatant commands, the planners have focused primarily on logistics and omitted staff planning in the other functional areas. The lack of a comprehensive approach to OCS integration across the functional areas within the combatant commands leaves gaps in planning and excludes OCS requirements that will be needed to implement such plans in the future.

After combatant commands complete their plans with associated annexes, the component commands of the combatant commands use these plans to begin service-specific planning to support operations. JCASO planners assist in planning at the strategic level, but no organic JCASO planners assist at the operational or service-component levels. The JCASO has not allocated planners within each service component in the planning process.

Outside of the Army, no service has issued service-specific guidance to fully implement OCS planning at the service-component level. The Navy, Marine Corps, and Air Force have initiated training but have not developed service-specific guidance for fully integrating OCS into contingency operations.

OCS Lessons Learned

The DOD established the Joint Lessons Learned Program (JLLP), which is enabled by the Joint Lessons Learned Information System. The purpose of the JLLP is to capture critical issues and best practices discovered during operations and enable the force as a whole to improve operational outcomes.

A key finding of a recent review of the JLLP in relation to OCS found that, with the exception of the Army, the military services and component commands are not collecting OCS lessons learned for force improvement. Although the combatant commands have put OCS-related issues into the JLLP, they have not used the system to monitor the progress and resolution of OCS issues after they are entered.

What these trends affirm is that OCS is neither understood nor fully appreciated as a key enabling joint capability and that the combatant commands' reluctance to use lessons learned compounds the issue.

OCS Training

Training is a hallmark of all military services, and a lack of OCS training has contributed to the continued lack of awareness within the DOD. In order for OCS training to become part of the culture, OCS must be recognized as important to operations.

Currently, commanders and senior leaders within the DOD are not required to receive OCS training. While the Joint Staff J-4 does offer a training course on OCS, planners outside of the logistics functional areas within combatant commands and service components rarely attend this training. This statistic continues to drive the overall lack of awareness and the need for increased emphasis on OCS.

Air Force Staff Sgt. Graham Staudt, a contract specialist with the 633rd Contracting Squadron, listens to a briefing at the Operational Contract Support Joint Exercise 2017 on March 22, 2017, at Fort Bliss, Texas. (Photo by Tech. Sgt. Chad Chisholm)

OCS Successes

OCS awareness has begun to take root within the DOD. These acknowledgments and changes across the department are instrumental steps that are closing the gap in awareness.

In 2012, then chairman of the Joint Chiefs of Staff Gen. Martin Dempsey remarked, "We should acknowledge that [OCS] is no longer a niche capability … Contractors are part of our total military forces."

This recognition of OCS as a critical and necessary joint function was a positive step in elevating OCS to the proper level. Additionally, in a May–June 2016 *Army Sustainment* article, the commanding general of the Combined Arms Support Command implored the sustainment community to learn about OCS.

In response to leaders' emphasis on OCS, the Army has established an OCS capability manager. The Air Force has also issued an OCS policy memo, and the Marine Corps has placed dedicated OCS personnel at relevant levels of command. To address the deficiency within the lessons learned program, the Joint Staff J-4 has completed an OCS lessons learned guide, which will be published in the near future.

Recent changes in courses offered throughout the DOD are beginning to elevate awareness across the joint force. Some examples include the Army Logistics University's OCS Course, the Defense Acquisition University's Joint Contingency Contracting Course, and the Joint Staff J-4's Joint OCS Planning and Execution Course. These courses will have a cascading positive effect on forces as graduates plan, prepare, and execute OCS within the combatant command operational areas.

Section 845 of the National Defense Authorization Act for Fiscal Year 2013 incorporates OCS as a subject for joint professional military education. The DOD is also in the process of updating DOD Instruction 3020.41, Operational Contract Support (OCS), which will add requirements for OCS training. This instruction is scheduled for publication in 2018.

Now some final changes are needed to elevate OCS to the level required to obtain the operational outcomes that the joint force requires for success in future operations.

The establishment of JCASO planners within each combatant command has elevated support, increased awareness, improved planning processes, and given credibility to OCS at the strategic level. These changes are complemented by the annual OCS Joint Exercise, which offers joint service members a venue to enhance their skills before deployments.

Recommended Improvements

The bedrock elements necessary to improve and enhance OCS are in place. Now some final changes are needed to elevate OCS to the level required to obtain the operational outcomes that the joint force requires for success in future operations.

While adding OCS to joint professional military education is an important first step, it does not go far enough to close the awareness gap within the services. OCS training must be required for all commanders beginning at the O-5 level in all services. This training should then continue for each level of command thereafter to ensure that every senior officer understands OCS fundamentals.

Expanding the Joint Staff J-4's Joint OCS Planning and Execution Course for senior staff officers across the services is the next requirement to increase OCS awareness in the services. Because of the course's limited availability, in many instances only service members scheduled to deploy can receive the training. Each service should independently train and develop cadre to deliver this course, thus taking the burden off the Joint Staff J-4.

The Joint Staff's OCS Joint Concept envisions OCS to be a fully interdependent capability of Joint Force 2020. In order to achieve this objective, OCS personnel and organizational structure must be added to authorization documents at the combatant command and service component command levels. Dedicated personnel and authorized planning structures will ensure that OCS remains a key joint enabling capability in the future force.

In order to enable the joint force to operate effectively across all spectrums of conflict, a robust cadre of skilled OCS planning professionals must be a mainstay of all future operations. The addition of a dedicated cadre will ensure that the awareness and appreciation of OCS across the joint force are sustained over time. This will ensure that OCS becomes an interdependent joint capability of the future force.

Brig. Gen. Jeffrey A. Doll is the director of the Forward Operational Contract Support Integration Cell, U.S. Central Command, in Qatar. He holds a master's degree in strategic studies from the Army War College, an MBA from Southern California University, a bachelor's degree in political science from the University of North Dakota, and an associate degree in political science from Bismarck State College.

The Role of a Noncommissioned Officer in a Joint Forces Environment

The Defense Logistics Agency's senior enlisted Soldier discusses the unique opportunity and responsibility of leading a predominantly civilian workforce in a joint force environment.

■ By Command Sgt. Maj. Charles Tobin

As the senior enlisted leader for the Defense Logistics Agency (DLA), I have a unique and dynamic joint military-civilian assignment. About 95 percent of the agency's more than 25,000 personnel are Department of Defense civilians. The remaining 5 percent are active duty and reserve military members.

Traditionally, the senior enlisted leader of an organization advises the commanding officer on all matters pertaining to enlisted personnel, but because DLA is mostly civilian, I advocate for all employees. Unusual? Absolutely. But it's an example of how different a military-civilian environment can be from one that is only military.

Becoming a Joint Forces Fan

Today I'm "all in" for the joint experience, but I didn't always feel this way. Not long ago, many service members, including me, saw a joint assignment as a dead end because it separated us from promotions and other opportunities the services provided.

In 2005, after serving more than 20 years in the Army, I received my first joint assignment at the U.S. European Command headquarters in Germany. The Army was all I had known, so I was not prepared to adapt to the joint assignment. I tried to impose the Army culture on the joint environment and received a lot of pushback. It was a learning experience.

After my time in Germany, I participated in several joint operations in Afghanistan and exercises in the U.S. Pacific Command and also some special operations exercises. These experiences made me realize the advantage of being able to apply all of the services' diverse skills and capabilities to one mission. With each joint experience, I became less of a skeptic and more of a fan.

The DLA Way

I experienced culture shock when I arrived at the DLA headquarters at Fort Belvoir, Virginia. The mostly civilian workforce makes the agency completely different from a service command and even from most joint organizations. In addition, DLA's customers include all of the services, the combatant commands, and many non-Department of Defense agencies.

I had never dealt with organizations like the Department of State or the Federal Emergency Management Agency in past assignments. Working at DLA has given me a completely new perspective.

When I speak to military members, I always emphasize how important joint assignments are to their careers. I stress the importance of flexibility. A joint environment is different from a service environment—not better or worse, just different.

I try to dispel the myth that joint assignments are a dead end for promotions by talking about instances when joint assignments contributed to promotions. I also stress that, to boost their careers, noncommissioned officers (NCOs) and petty officers have to be willing to leave their comfort zones and take some calculated risks.

I have met enlisted service members who took joint assignments and were rewarded with a wealth of knowledge and experiences that are invaluable to their military careers. Their respective services benefit by getting leaders who can think critically and strategically and adapt to ever-changing environments.

Networking is another rewarding aspect of joint assignments. For example, in my job, I have the opportunity to reach out to a variety of enlisted leaders all over the world. When I give an overview of DLA to these leaders, they are amazed at the range of DLA's activities. I understand their feelings because, before I arrived, I underestimated the scope of the agency.

I visit senior enlisted leaders to network and build relationships. I try to maintain a dialogue with them about DLA's support to the warfighter. I always ask, "What can DLA do to support you better?"

Outreach is important because I want to inform these influential people about the capabilities DLA offers. I encourage them to let their commands know about the support that DLA can provide. I want them to know that when they are out in the field, DLA is often nearby and can help them carry out their missions.

In a traditional service environment, senior enlisted leaders take care of their people. At DLA, the only difference is the people that I advocate for extend well beyond the enlisted community.

The most important factor con-

Command Sgt. Maj. Charles Tobin, the Defense Logistics Agency's senior enlisted leader, and Sgt. 1st Class Byron Briscoe shake hands during a Defense Logistics Agency briefing in Caserma Ederle in Vicenza, Italy, on July 27, 2016. (Photo by Antonio Bedin)

tributing to DLA's mission success is its employees. DLA has representatives all over the United States and the world. I have met DLA personnel serving the warfighter in remote places. Often, these employees work as the sole DLA representative in a service component command or on an installation. When I meet them, I let them know I am their advocate.

Why I Do What I Do

The people make me passionate about coming to work every day. My role at DLA is about logistics and sustainment, but it really comes down to people.

When I attend DLA town hall meetings in the United States and abroad, the DLA director gives me time to speak to the workforce. I use my time to thank employees for what they do in support of the warfighter. I feel that sometimes they don't get the credit for all they do, so I want to make sure they know their work is appreciated.

The director and I get a lot of positive feedback from customers, and I want to make sure I pass it along to the workforce. They are the ones who do the work, so they deserve the credit.

I also take time every day to talk to a Soldier, Sailor, Airman, or Marine. I like to find out what's on their minds and what they care about because I never want to lose touch with the enlisted community.

When I arrived at DLA, I did not want to impose my own agenda. My number one goal was to support and promote the agency's goals, vision, and mission. I figured that if I did that, I would be supporting the director and the customers at the same time. It helped that DLA had established a first-rate vision and mission and comprehensive strategic goals.

I am enthusiastic about DLA's values of resilience, innovation, integrity, diversity, accountability, and excellence. I live by these values, and I love talking about them to the workforce.

Looking to the future, I think enlisted positions at DLA will become more competitive. I have seen a definite increase in interest from enlisted personnel in DLA assignments because of the promotion opportunities and joint experiences these assignments offer. NCOs and petty officers who come to DLA are hand-selected, and we look for high performers.

I worked hard, but I never dreamed that I would be selected as the senior enlisted leader of a dynamic agency like DLA. Serving with the talented men and women who continue to serve warfighters has been the highest honor of my career.

For up-and-coming enlisted leaders, my advice is to do your best in your current assignment, and don't get so locked into your service culture that you can't adapt to a joint environment. As enlisted leaders, we must learn to be adaptive, agile, and strategic because joint is the way of the future.

Command Sgt. Maj. Charles Tobin is the senior enlisted leader of DLA. He holds a master's degree in management from Webster University. He is graduate of the First Sergeants Course, the Sergeants Major Academy, and the Force Management, Keystone Leader, Inspector General, Battle Staff, and Jumpmaster Courses. He is also a graduate of the Basic Airborne and Air Assault Schools.

Benefits of the Joint Humanitarian Operations Course

A two-day course teaches sustainers how to integrate military support into disaster relief missions.

■ By Lt. Col. George "Kris" Hughes and James L. Kennedy Jr.

It is any night of the week, and you are listening to the news. You hear the reporter say there has been a natural disaster in a foreign country that will require humanitarian assistance. Seeing the initial photos on the TV, you know that there will soon be a request for international assistance and have no doubt that the U.S. ambassador in that country will recommend that the United States be a part of the international response.

What comes next? Who will lead the government's support? What support will the military provide? If you are a logistics planner on a division, corps, or Army service component command (ASCC) staff, what immediate actions might you take to prepare your command to provide support?

To help sustainment professionals prepare for such a scenario, the Office of Foreign Disaster Assistance (OFDA) under the U.S. Agency for International Development (USAID) created the Joint Humanitarian Operations Course (JHOC). This two-day course teaches Department of Defense (DOD) personnel how the government responds to international disasters.

OFDA's Disaster Role

OFDA is the lead for coordinating the government's response to disasters overseas. It has a mandate to save lives, alleviate human suffering, and reduce the social and economic impact of disasters.

In this role, OFDA responds to an average of 70 foreign disasters every year. OFDA ensures aid reaches people affected by rapid- and slow-onset disasters and crises. OFDA fulfills its mandate worldwide in partnership with USAID functional and regional bureaus and other government agencies.

USAID has requested DOD's support in various operations because of the DOD's unique capabilities, such as the transport isolation system and mobile diagnostic laboratories.

A recent example of DOD supporting USAID is the West Africa Ebola outbreak in 2015. Planners at the U.S. Africa Command and U.S. Army Africa were able to effectively integrate into the response planning effort and assist USAID because they had attended the JHOC.

Course Specifics

The JHOC is conducted by OFDA subject matter experts who have vast field experience in humanitarian assistance and disaster relief operations and in working with the military. The course begins with an overview of USAID and OFDA that explains the criteria that must be met before the United States will consider responding to an international disaster.

The course discusses the mission tasking matrix, which comes from an OFDA civilian-military coordinator and is used to request assistance from the DOD. It also covers OFDA-DOD collaboration, provides an outline of the humanitarian food program, and discusses the roles of military liaison teams and disaster assessment and response teams.

The course has two practical exercises. The first allows students to apply knowledge gained in the course to a training scenario based on Typhoon Haiyan, the powerful tropical storm that devastated portions of Southeast Asia, particularly the Philippines, in 2013. The second exercise has five separate briefings covering small- to large-scale operations.

Course Benefits

The JHOC is highly recommended for organizations that will potentially have a direct role in supporting USAID in humanitarian assistance and disaster relief operations. Staff planners at the corps, division, and expeditionary and theater sustainment command levels will benefit from knowing how USAID operates, how it requests support for assistance, USAID common terminology, and the systems it uses.

Currently, there is no cost to units for an OFDA mobile training team to conduct the two-week training on site. Therefore, training 35 to 45 officers and noncommissioned officers to understand and work with USAID will pay large dividends when the need arises. Additionally, each combatant command headquarters has OFDA representatives, so units near these headquarters or USAID regional offices can enroll their personnel in a nearby course as long as seats are available.

A final advantage of attending JHOC is that the joint staff J-7 has accredited the JHOC to give suc-

A U.S. Agency for International Development team led by Maj. Gen. Gary Volesky, commander of the Joint Forces Command–United Assistance, makes its way to meet with local city and medical officials on Nov. 3, 2014, to discuss the build sites for an Ebola treatment unit in Ganta, Liberia. (Photo by Sgt. 1st Class Nathan Hoskins)

cessful attendees a half-point professional military continuing education credit.

The benefits of this course are tremendous for units and Soldiers who will work with OFDA and USAID during emergency operations. Personnel who are trained in humanitarian assistance and disaster relief operations are needed now and will continue to be needed in the future.

We owe it to our leaders and planners to provide the best training for a wide variety of missions. By having Soldiers attend the JHOC, we will ensure we have the most well-trained and agile planners and staff possible.

Lt. Col. George "Kris" Hughes is a force management and sustainment instructor at the Army Command and General Staff College. He holds a bachelor's degree in secondary education from The Citadel, a master's degree in human relations from the University of Oklahoma, and an MBA from Norwich University.

James L. Kennedy Jr. is a retired logistics officer. He is an assistant professor teaching force management and sustainment at the Army Command and General Staff Officer Course at Fort Belvoir, Virginia. He holds a bachelor's degree in chemistry from Presbyterian College, a master's degree in logistics management from the Florida Institute of Technology, and a master's degree in military history from the Command General Staff College. He is working on a master's degree in education from George Mason University.

To enroll in the Joint Humanitarian Operations Course, contact USAID OFDA at ofdainquiries@ofda.gov.

The Strategic Broadening Seminars Prepare Leaders for the Complexities of Tomorrow

A logistics officer used a postgraduate program as a broadening experience to become a strategic thinker.

■ By Capt. Kwansah E. Ackah

The Army's Strategic Broadening Seminars (SBSs) introduce junior and midcareer leaders to the discipline of strategic planning. The postgraduate seminars are part of the Strategic Studies Fellows Program.

The seminars range in duration from three to five weeks and take place at eight civilian and military academic institutions in the United States, Great Britain, and Israel. Participants are exposed to new concepts that challenge their preconceived ideas about military, business, and economic problem-solving and conflict resolution.

The Office of the Chief of Staff of the Army and the Army G-3/5/7 asked the Institute of Defense and Business at the University of North Carolina (UNC) to develop the program five years ago. The objective was broad, and the Army had one stipulation: the program and curriculum could not resemble any existing military program.

The Selection Process

SBS seats are advertised through military personnel messages posted on the Human Resources Command website. While prospective participants are asked to indicate a location preference, selections and assignments are at the discretion of the Army G-3/5/7. A participant is assigned to a particular seminar location based on factors such as military occupational specialty, branch, file strength, and availability of funds.

The SBS is a fully funded program with no strings attached. There are no additional active-duty service obligations, no restrictive post assignments, and no cost to parent units. Graduates earn additional skill identifier 6Z (strategic studies graduate), which is annotated on their enlisted record briefs or officer record briefs.

Program Experience

I had the opportunity to attend a four-week SBS at UNC in 2016. The schedule was hectic. On a daily basis, the list of guest lecturers included professors, doctors, politicians, active duty and retired general officers, and senior executives who offered thought-provoking questions that required students to prepare for class and pay attention.

Week one. The first week included a visit to a Marine Corps veteran-run organization that donates food worldwide. The goal for the visit was to learn the organization's strategies and to offer strategic solutions. It was an opportunity for students to practice newly acquired skills, spend time away from the classroom, and engage in community service.

Week two. During the second week, instruction was heavily focused on negotiation skills, global financial securities, power strategies, and strategic innovation. Simulations and role-playing scenarios allowed students to hone their negotiation skills and practice applying appropriate strategies to a variety of complex situations. The classes were interactive, allowing students to engage and discuss several negotiation scenarios and outcomes.

Required reading assignments averaged between 150 and 250 pages per night. Groups were assigned topic scenarios for the final projects. The groups were also assigned a retired general officer or civilian executive mentors who offered in-depth knowledge in their focus areas.

Week three. During the third week, students developed interview skills and explored how the media's portrayal of current events can frame public opinion and affect strategic planning. We also visited a TV studio, conducted mock interviews, and explored how military strategists can employ the media as a problem-solving tool and a means for strategic messaging.

Students visited a solar energy company and an analytics software company. We met with the vice chief of staff of the Army, who expounded the importance of staying engaged and informed in order to provide superiors with feasible strategic options to address future challenges.

Week four. By week four, each group had already completed multiple meetings with their mentors, a dry-run presentation, a strategic messaging-check presentation, and a

group briefing to a panel of professors. The focus of week four was to complete the assigned project and capstone paper and prepare for the final brief. The final brief was a two-round presentation that allowed each group to address a problem using the critical thinking skills developed throughout the program.

The program concluded with a formal dinner where graduates were awarded a joint certificate from UNC and Indiana University worth 1.5 graduate-level credit hours and membership into the Strategic Studies Fellows Program.

Why Apply?

The ability to successfully support the warfighter relies heavily on the ability of leaders to forecast requirements. The right forecasting requires the ability to see the problem at hand, anticipate future needs, and derive appropriate support.

SBS is an opportunity to meet and learn from current and former Department of Defense senior leaders, political leaders, and some of academia's best professors who have decades of experience working in the defense realm. More importantly, it is an opportunity to expand your thinking, engage peers, and establish long-lasting relationships.

Every junior to mid-level Army leader should consider applying to this program. They will embark on a unique journey through state-of-the-art approaches to problem-solving.

Successful entrepreneurs will engage students in conversation and mentor them in ways that provide insight into operational models that have yielded measurable success in the private sector. Esteemed professors will guide them in understanding how to use these lessons in military strategic operations.

After this course, I returned to my duty station a more adept and innovative strategic thinker. Because of this broadening experience, I can say confidently that today I am a stronger leader and a better Soldier.

Capt. Kwansah E. Ackah is an assistant course director of military science, an instructor, and a logistics mentor at the U.S. Military Academy. He is enrolled in the Master Teacher Program under the academy's Center for Faculty Excellence, and he is pursuing his master's degree in business administration.

Writing for *Army Sustainment*

We are always looking for quality articles to share with the Army sustainment community. If you are interested in submitting an article to *Army Sustainment*, please follow these guidelines:

- ☐ Ensure your article is appropriate to the magazine's subjects, which include Army logistics, human resources, and financial management.
- ☐ Ensure that the article's information is technically accurate.
- ☐ Do not assume that those reading your article are Soldiers or that they have background knowledge of your subject; *Army Sustainment*'s readership is broad.
- ☐ Write your article specifically for *Army Sustainment*. If you have submitted your article to other publications, please let us know at the time of submission.
- ☐ Keep your writing simple and straightforward.
- ☐ Attribute all quotes to their correct sources.
- ☐ Identify all acronyms, technical terms, and publications.
- ☐ Review a past issue of the magazine; it will be your best guide as you develop your article.

Submitting an Article

Submit your article by email to usarmy.lee.tradoc.mbx.leeeasm@mail.mil.

Submit the article as a simple Microsoft Word document—not in layout format. We will determine the layout for publication.

Send photos as .jpg or .tif files at the highest resolution possible. Photos embedded in Word or PowerPoint cannot be used.

Include a description of each photo in your Word document.

Send photos and charts as separate documents.

For articles intended for the Operations department, obtain an official clearance for public release, unlimited distribution, from your public affairs and operational security offices before submitting your article. We will send you the forms necessary for these clearances.

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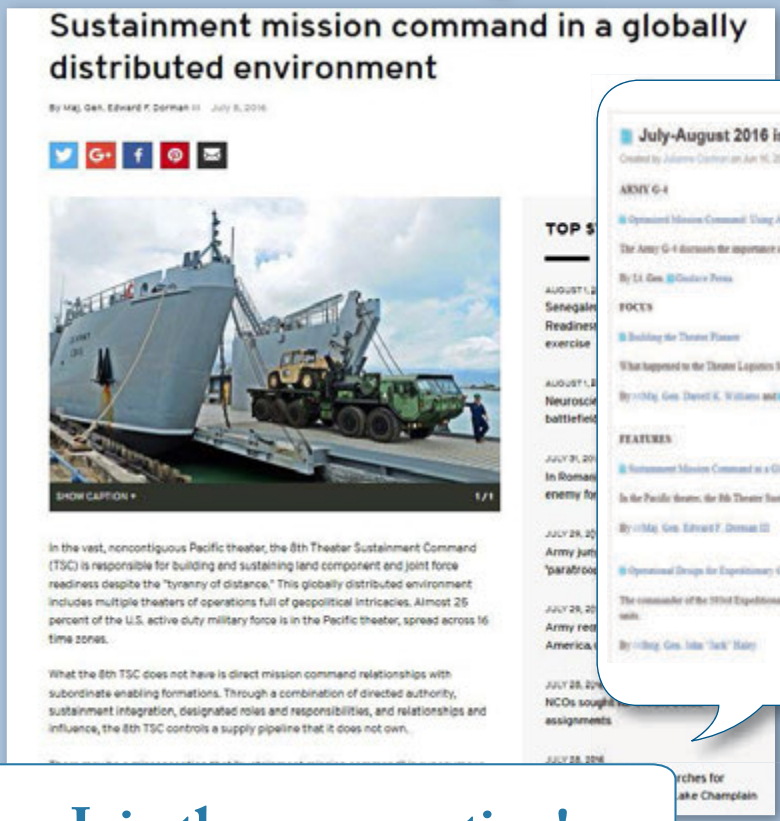
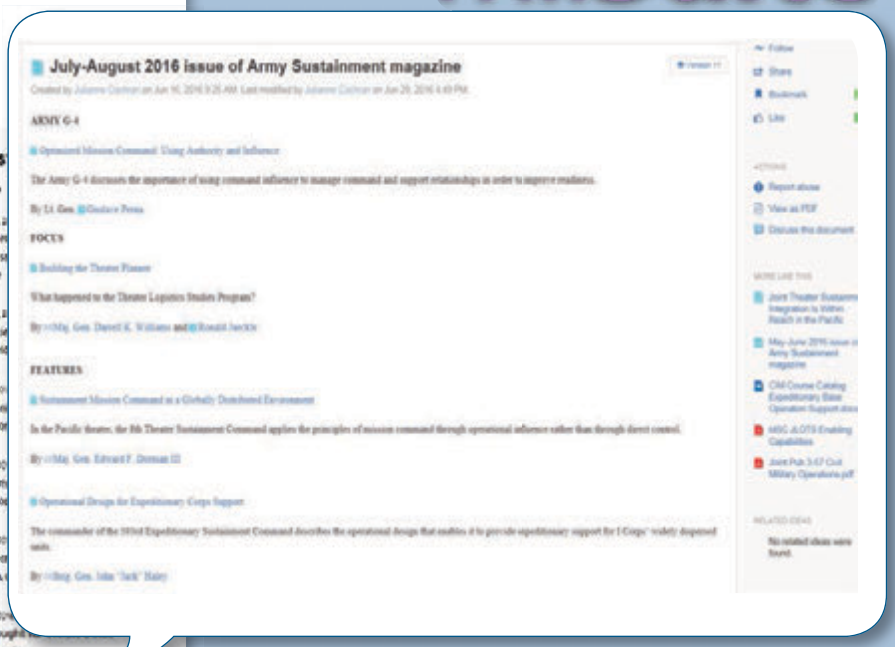

Sustainment mission command in a globally distributed environment

In the vast, noncontiguous Pacific theater, the 8th Theater Sustainment Command (TSC) is responsible for building and sustaining land component and joint force readiness despite the "tyranny of distance." This globally distributed environment includes multiple theaters of operations full of geopolitical intricacies. Almost 25 percent of the U.S. active duty military force is in the Pacific theater, spread across 16 time zones.

What the 8th TSC does not have is direct mission command relationships with subordinate enabling formations. Through a combination of directed authority, sustainment integration, designated roles and responsibilities, and relationships and influence, the 8th TSC controls a supply pipeline that it does not own.


July-August 2016 issue of Army Sustainment magazine

ARMY G-4

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FEATURES

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Army Sustainment added 5 new photos.
Published by Roger RyDell Daniels [?] · July 18 at 9:07am

#Didyouknow that the U.S. Army has ships?
What does the U.S. Army do when it has to haul thousands of tons of equipment and vehicles across an ocean to operations in places like the Middle East? It calls upon its fleet of Logistical Support Vessels (LSV) and Landing Craft Utility vessels (LCUs).
Continue to read here: https://www.army.mil/article/171455/
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Raymundo Perez The army has more ship this kind than the navy.
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Mario L Correal Thanks for your service and sacrifice God bless your guys and family members and friends and keep us safe and free
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Christian Piloneo Wow
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Len Bowen The British Army was/is there, too.

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Jose Carrion As active, was there, 88N, 88M, brought a lot of memories.
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Jeanine Fuentes Go TC spear head of Logistics!!
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Bobby Dowell Need a job can u get me in
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Maureen M Murawski Thanks for sharing. I thought everything was flown in.
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Shirley Yaw Thank you for your service and your many sacrifices . God bless
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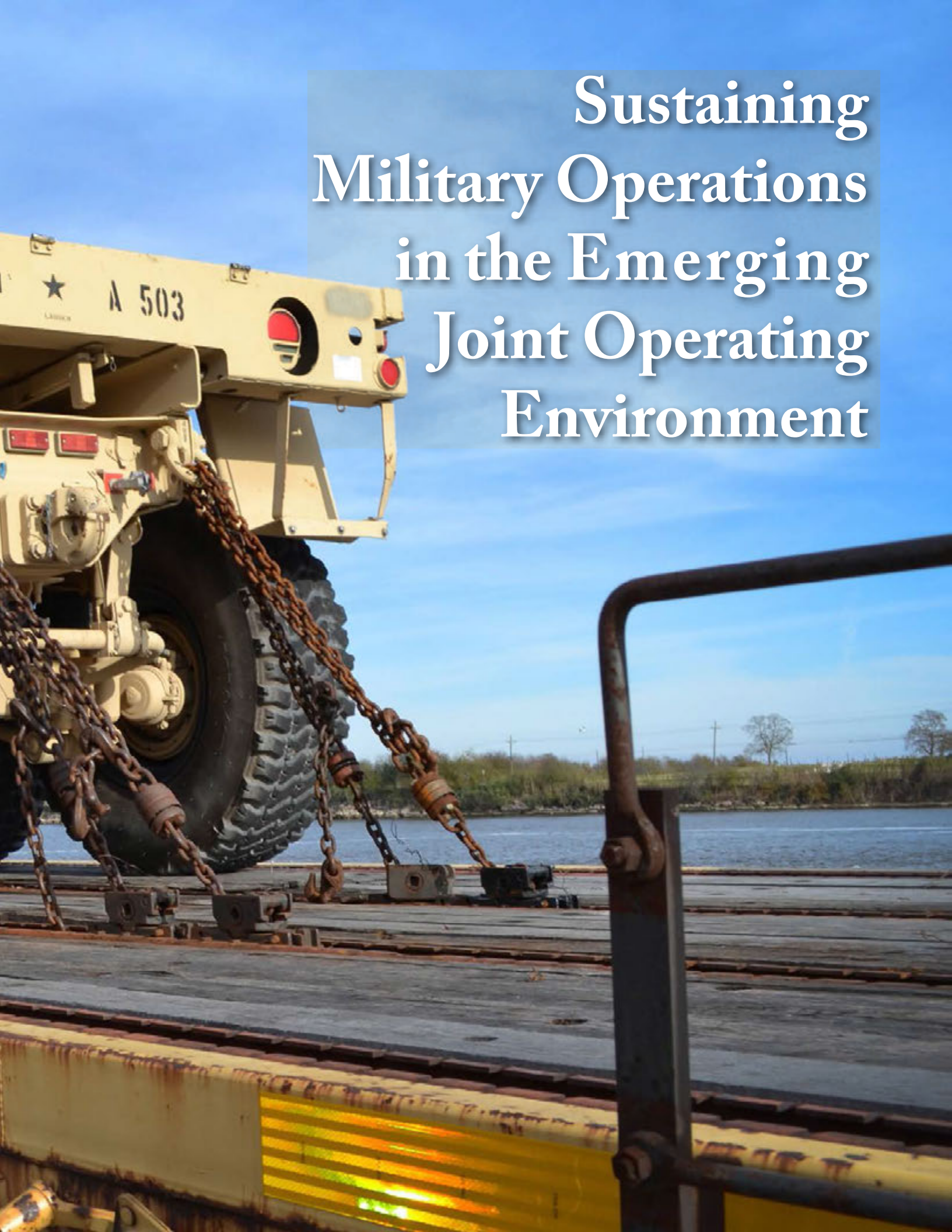
The 842nd Transportation Battalion, 597th Transportation Brigade, Military Surface Deployment and Distribution Command, orchestrates terminal operations for the loading of unit equipment and the offloading of cargo at the Port of Beaumont and Port Arthur, Texas, in December 2013. (Photo by Sarah Garner)



Sustaining Military Operations in the Emerging Joint Operating Environment

Sustainers must think critically and innovatively to adapt to the emerging joint operating environment.

■ By Lt. Gen. Stephen R. Lyons

The U.S. Transportation Command (USTRANSCOM) has never been a stranger to innovation. As it celebrates its 30th anniversary this year, the command is taking time to reflect on the past. Before USTRANSCOM's establishment in 1987, the concept of forming a unified, joint command whose sole purpose is to serve as a nexus for strategic mobility was generally unpopular.

At a time when other commands were struggling to maintain personnel, equipment, and budgets, a fledgling USTRANSCOM was considered to be diverting valuable resources. Within a few years of its establishment, however, USTRANSCOM proved its worth when it was asked to deploy in support of Operation Desert Shield, the nation's largest force commitment since D-Day.

The operation's overwhelming success prompted Gen. Colin Powell, who was then chairman of the Joint Chiefs of Staff, to sing USTRANSCOM's praises. He called the operation the command's "graduation exercise," and as far as he and the president were concerned, USTRANSCOM had just graduated magna cum laude.

The Changing Environment

We military professionals understand that logistics is critical to our nation's ability to project power around the world. It is viewed by both our partners and our potential adversaries as a comparative advantage. The nation's ability to deploy rapidly and sustain military power on a global scale provides U.S. political leaders with multiple options for pursuing national interests.

The quiet professionals of the joint logistics enterprise play a critical role in the nation's defense. As professionals, they are compelled to ensure that strategic logistics and the ability to project military power globally remains a comparative advantage for the United States well into the future. However, logistics professionals should assume that what has worked in the past will not produce success in the future.

The joint operating environment is rapidly changing. It is characterized by emerging near-peer competitors and the need for integrated transregional, multidomain, multifunctional operations. As a result, the Department of Defense (DOD) must challenge assumptions about logistics and sustainment operations.

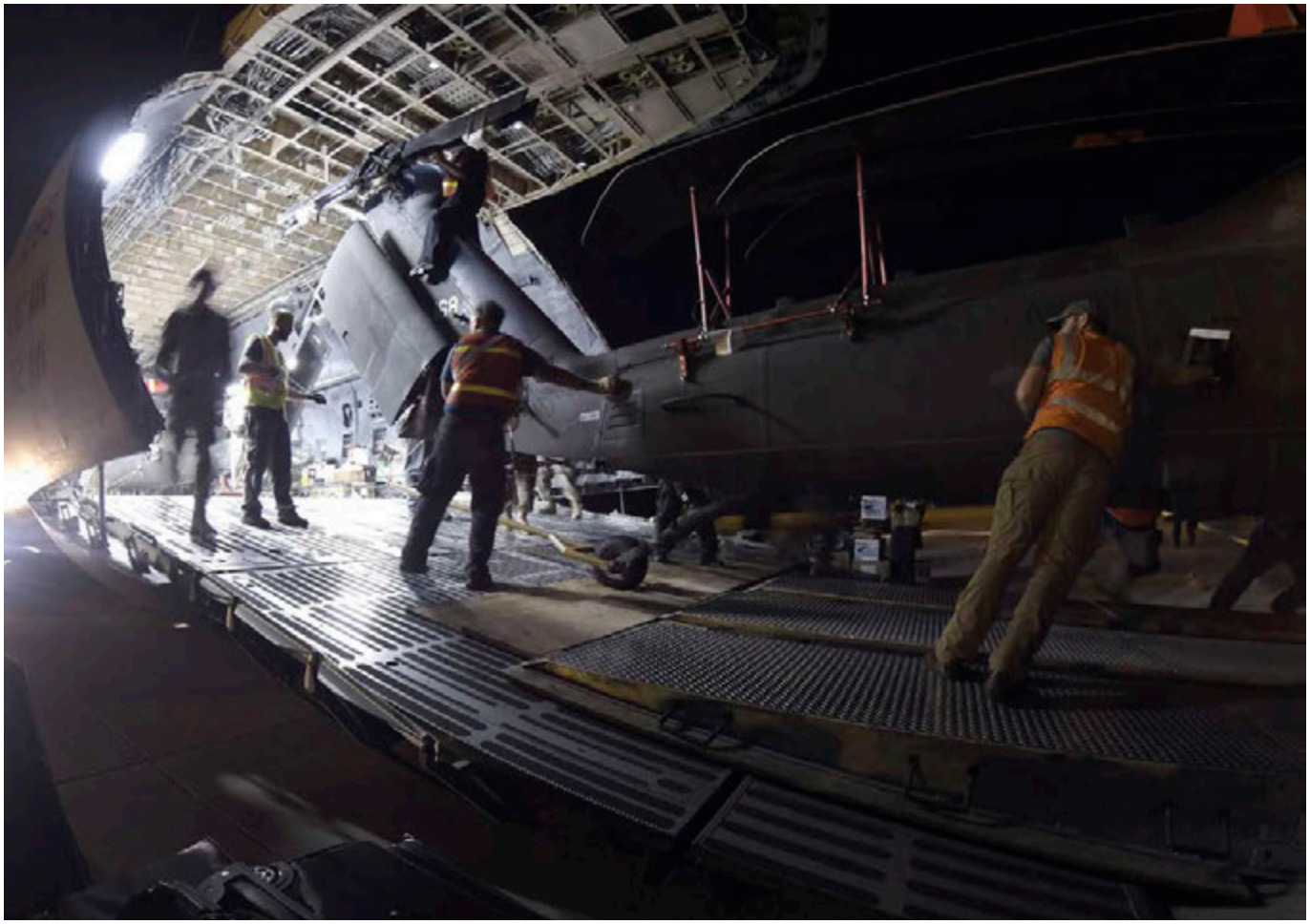
For example, we DOD personnel cannot assume that we will operate with impunity (zero attrition), retain assured geopolitical access, maintain cyber mission assurance, and receive approval for the timely mobilization of enabler forces. We should anticipate long and contested lines of communication. As this audience is aware, logistics often precedes maneuver, so we should expect to have to fight just to get to the fight.

Technological Challenges

The nation's future adversaries are becoming more advanced and more deadly. Every day, more cyber threats emerge with the intent to disrupt and degrade the nation's ability to project and sustain forces globally. The DOD must face difficult truths and understand potential weaknesses so they can be fixed now, not later. These challenges can seem daunting. How, then, are we to face these tests?

Solutions will undoubtedly span the full spectrum of joint capabilities integration (doctrine, organization, training, materiel, leadership and education, personnel, and facilities). Fundamentally, the DOD must consider ways to deliver lethal effects in nontraditional ways that will reverse the ever-increasing logistics burden.

Today's high-tech warfighting investments to enhance lethality, mobility, and survivability continue to drive increased requirements for strategic mobility, fuel, ammunition, and other critical sustainment needs. Innovations such as autonomous technologies, artificial intelligence, and smart data will clearly play larger roles in the wars of tomorrow.



A UH-60 Black Hawk helicopter is unloaded from a C-5M Super Galaxy transport aircraft from Dover Air Force Base, Delaware, on April 8, 2017, at Robert Gray Army Airfield, Texas.

Thought and Innovation

However, innovation is more than just technological advances. Overcoming these challenges and the many that will follow requires innovation and critical thought on how to conduct operations in the joint operating environment. Technology by itself will not be our salvation.

To succeed on future battlefields, we DOD professionals must always be willing to think differently, challenge our processes, and expand our minds about concepts not previously accepted. Intellect will lead physical change. Ultimately, it is our people and their proven intellect, agility, ingenuity, and ability to adapt faster than our adversaries that will lead us to future victories. In the end, it is only victory that counts.

Warfighting readiness will always remain the number one priority. However, the character of war is changing rapidly. Again, what works today will not lead to future success. The time is upon us to shape the future, to challenge the validity of our "sacred cows," and to set the conditions for those who will follow us to achieve victory.

The services must think more jointly and look for ways to integrate the logistics value chain (from factory to foxhole) with an eye toward one outcome: warfighting effectiveness. In doing so, they will preserve their ability to project military power, rapidly replace lost combat potential, and enable global reach, freedom of action, and continuity of operations in order to meet national objectives.

The DOD requires innovative thought and empowered, critical thinking at every echelon, and it must act now. As the chief of staff of the Army, Gen. Mark A. Milley, persuasively said, "The pain of preparation is always less than the pain of regret."

I have great confidence that this audience will remain wide-eyed about future challenges and continue to adapt to the emerging joint operating environment. I could not be more proud of the sustainment professionals who have contributed so much to our nation's success. Thanks for all you do; you remain equal to the task. Together, we must deliver!

Lt. Gen. Stephen R. Lyons is the deputy commander of USTRANSCOM at Scott Air Force Base, Illinois.

Marines attached to the 3rd Transportation Support Battalion, 3rd Marine Logistics Group, move a hose reel system during Operation Pacific Reach on April 5, 2017. The bilateral training event exercised an area distribution center, an air terminal supply point, combined joint logistics over-the-shore, and the use of rail, inland waterways, and coastal lift operations to validate the operational reach concept. (Photo by Petty Officer 2nd Class Eric Chan)

Extending Operational Sustainment in Korea

U.S. Forces Korea and the Republic of Korea are using distribution hubs with air terminal supply points and area distribution centers to meet their operational sustainment goals on the peninsula.

■ By Brig. Gen. Michel M. Russell Sr. and Brig. Gen. Jae Pil Jeon

Providing joint operational sustainment in the Korean theater of operations (KTO) to ensure the commander is able to maintain operational options and reach presents challenging and unique opportunities for U.S. Forces Korea (USFK), the United Nations Combined Forces Command, and Republic of Korea (ROK) forces. While the ROK is a first-world nation with a very capable infrastructure, conducting military operations in and around the ROK remains problematic. The ROK's most significant challenge is distribution.

Geographic Challenges

The ROK presents difficulties for USFK sustainment planners. More than 55 million residents live in a country roughly the size of Indiana, and more than half of them dwell in the greater Seoul metropolitan area—a "megacity" by any definition. The most complicated challenge is maintaining access to and mobility on the heavily congested ground lines of communication (LOCs).

The ROK comprises the lower half of the Korean Peninsula. The nation is surrounded by water on all sides except for its north, where a narrow demilitarized zone serves as its only land border. Since this border is with a hostile state, all sustainment that does not originate in the ROK must be flown or shipped into the country.

The Distribution Hub Concept

Extraordinary efforts have been made to ensure support contingencies focus on successful distribution strategies. These strategies emphasize the establishment of distribution hubs and the use of interoperable equipment.

The distribution hub concept used in the ROK has evolved over time. It is a contemporary operational yet nondoctrinal approach developed for use within USFK. Distribution hubs help USFK sustainment planners to rely less on ground LOCs and more on over-the-shore and aerial delivery sustainment methods.

Successfully establishing, employ-

ing, and maintaining a distribution hub requires viable ports, airfields, and outbound road networks. Establishing distribution hubs along the coast in close proximity to these assets extends operational reach. A commander can potentially move units up either or both coasts to create sustainment and distribution centers that provide critically needed commodities and evacuation nodes for casualties or equipment requiring repair.

While coastal distribution hub establishment is an adaptive approach, it is not without difficulties. The Sea of Japan is always congested with traffic, and tidal flats extend out six to eight miles on the Yellow Sea with tidal fluctuations varying up to 30 feet throughout the day. This environment poses significant complications to establishing and maintaining coastal distribution hubs.

The distribution hub incorporates multiple modes of distribution for both inbound and outbound commodities. Each hub, once established, includes at least two of the following: an airfield, seaport, road network, rail connection, and inland waterway access point.

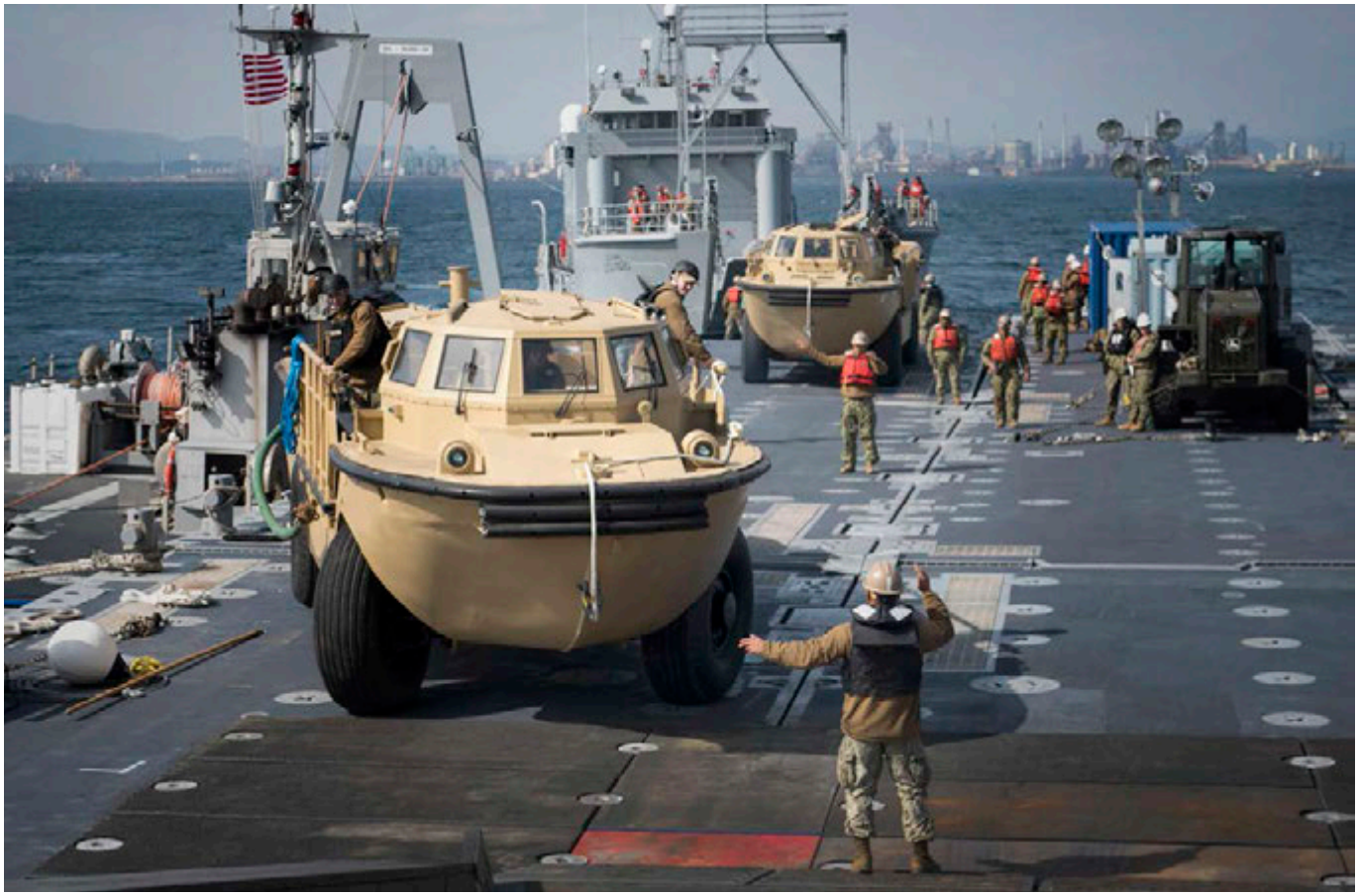
The interoperable sustainment nodes within the distribution hub are the air terminal supply point (ATSP), the area distribution center (ADC), and the expeditionary seaport. If an expeditionary seaport is not available, or is beyond repair, a beach support area hosting combined joint logistics over-the-shore capabilities can also be used.

The distribution hub is not a fixed size or structure. It is scalable in order to meet operational requirements, and it has the capabilities to accommodate multiple commodities, including fuel and water.

The Daegu-Busan enclave is an example of an ROK strategic distribution hub. It combines air terminal capabilities at Gimhae International Airport, the seaports at Busan and Chinhae, and storage, transloading, and distribution assets at Camp Carroll near Daegu. Successful distribution hubs leverage U.S. service components and combined forces component processes and systems to build interoperability. A key example is the ATSP.

The ATSP

An ATSP is an operational-level airfield used for aerial resupply and evacuation. It combines the concept of an air terminal with the concept of a ground distribution point. It is a designated air transportation hub



Soldiers, Sailors, and Marines offload equipment from the USNS Pililaau *using a roll-on, roll-off discharge facility off the coast of Pohang, Republic of Korea, during combined joint logistics over-the-shore on April 10, 2017. (Photo by Petty Officer 2nd Class Joshua Fulton)*

that accommodates the loading and unloading of aircraft and the processing of traffic in support of ground forces.

The ATSP is a critical method that the Combined Forces Command employs using the ROK's abundance of very capable airports that are often in close proximity to seaports and road and rail networks with well-developed infrastructure.

The ATSP and ADC are contemporary nondoctrinal terms used in USFK to fill joint doctrine gaps in terminology and in theater distribution operational concepts.

Proof of Concept

Operation Pacific Reach, conducted in April 2017 in Pohang, ROK, demonstrated the distribution hub concept by using existing port and airfield facilities to sustain alliance operations. This proof of concept was an important step as the alliance between the United Nations, the United States, and the ROK strives to build multifunctional sustainment hubs with synchronized force protection elements. These hubs provide the capabilities to overcome ground LOC congestion, to bridge shortfalls, and to bypass enemy activity.

Joint service equipment interoperability makes the distribution hub concept feasible. For example, fuel distribution begins six to eight miles offshore with the arrival of a fuel tanker. The offshore petroleum discharge system pumps fuel from a tanker to the high-water mark of the coast, where it joins with the amphibious bulk liquid transfer system (ABLTS).

The ABLTS serves as a "traffic cop" for inbound fuel by directing it to a variety of destinations that include on-ground storage tanks and bags for bulk storage. The ABLTS links directly with the inland petroleum distribution system, a pre-positioned stocks asset available for use in support of operations in the ROK. The inland system can move high volumes of fuel many miles to enhance the ADC's distribution capability and capacity, particularly as a distribution hub matures.

The ABLTS also links with the Marine Corps' assault hose fuel distribution system. This truck-mounted system's configuration makes it rapidly employable and enormously flexible. It adds another distribution capability dimension to a distribution hub.

Finally, the Eighth Army's "Fight Tonight" fuel distribution system, currently in beta testing in the ROK, connects to the ABLTS and ensures force fuel requirements are met during operations emanating from the coastline.

Interoperability

During Operation Pacific Reach, combined distribution exercise sustainers on the Korean Peninsula and stakeholders from across the global joint logistics enterprise demonstrated, coordinated, synchronized, and rehearsed theater logistics to overcome the challenges faced on the Korean Peninsula.

If the Korean Armistice is broken and wartime conditions resume, USFK and the ROK stand ready as a combined force to defend the ROK. Such a defensive effort would include numerous brigade-sized combat elements from the United States and from United Nations countries. When those elements unite with mobilized ROK forces into a combined forces command, the total personnel could easily top one million uniformed service members defending the ROK and repelling Democratic People's Republic of Korea forces.

Interoperability and flexibility are particularly critical in the Korean theater of operations because of the volatile situation anticipated during any conflict, including aggressive enemy special operations, missile strikes, and both friendly and enemy force movements. During Pacific Reach, USFK, in coordination with the ROK and U.S. service components, fielded interoperable systems and developed detailed plans to ensure uninterrupted force sustainment on the peninsula.

Sustainment options are the logistics courses of action that complement maneuver and air operations executed at the tactical level to extend the reach of operational forces. They include ground distribution points, airfields, seaports, and logistics over-the-shore operations. The ROK can provide much of this capability and capacity.

Sustainment opportunity diversification enables the maximum use of joint resources by leveraging all available LOCs, modes, and nodes. Diversification is a critical capability used to maintain the commander's decision space and to enable multiple options in the fight against the adversary.

Ultimately, using distribution hubs with multimodal throughput nodes, coupled with interoperability, reduces the stress on a single LOC while facilitating the operational reach and endurance of forward forces. These distribution hubs synchronize sustainment across the joint force to ensure that USFK and the alliance protecting the ROK deliver the right things to the right place at the right time.

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Brig. Gen. Jae Pil Jeon is the deputy assistant chief of staff, C-4, Combined Forces Command. He served in the ROK army as commander of the 161st Regiment, 60th Division, and as the executive officer for the Office of the Vice Minister, Ministry of Defense. He holds a bachelor's degree from the Korea Military Academy and a master's degree from Gangwon University.

An AH-64 Apache helicopter is unloaded from an Air Mobility Command C-5M Super Galaxy at Ramstein Air Base, Germany, on Feb. 22, 2017, in support of Operation Atlantic Resolve. (Photo by Staff Sgt. Timothy Moore)

Joint Logistics Capabilities for Credible Deterrence

■ By Col. Todd S. Bertulis and Capt. Matthew A. Gaumer

In the European theater, the joint force faces its most dynamic global security environment since World War II. Political volatility and economic unpredictability are now intensified by transregional, multidomain threats. The joint logistics enterprise (JLEnt) is playing a role in delivering the capabilities needed to provide credible deterrence in support of the NATO alliance.

The U.S. European Command (EUCOM) Logistics Directorate (ECJ4), other EUCOM directorates, NATO allies and partners, and the JLEnt are effecting an unprecedented security transformation. They are transitioning from being focused on assurance through engagement to being a warfighting command postured for deterrence and defense.

The entire JLEnt is working together in shaping logistics strategies, supporting NATO allies and partners, and setting the European theater to enable credible deterrence. It has already delivered results by playing a critical role in supporting the implementation of the European Reassurance Initiative (ERI).

EUCOM is supporting ERI implementation by operationalizing Army pre-positioned stocks, synchronizing the deployments of continental U.S.-based rotational brigade combat teams and combat aviation brigades, making multibillion-dollar investments for joint reception, staging, onward, and integration (JRSOI) operations, and providing logistics support for NATO's Enhanced Forward Presence in the Baltics.

The ECJ4, in concert with Joint Staff J-4, is also implementing cyber resiliency initiatives, providing assessments of service component logistics operations, capturing lessons learned from rotating logistics units, adding realism to exercises, and initiating logistics risk assessments and communications.

ERI Assurance to NATO

In response to the new European security environment, ERI was developed to address theater vulnerabilities. The initiative signals to European allies and partners that the United States is committed to the security and stability of the theater.

Since 2014, ERI funds have supported NATO assurance and Russian deterrence along the following five lines of effort laid out by the Department of Defense: enabling the U.S. presence, enhancing multinational training and exercises, improving infrastructure, pre-positioning equipment, and building partner capacity.

A key point of interest for logisticians about the ERI is its joint logistics undercurrents: unity of effort, joint logistics environment visibility, and rapid and precise response. Since 2015, a regimen of multinational exercises have revealed opportunities to gain logistics efficiencies. Some of the early activities included establishing armored European activity sets to provide training platforms for heel-to-toe rotating armored brigade combat teams and validating the throughput capability of key sea and aerial ports.

EUCOM has focused on high-visibility multinational operations and exercises in order to provide maximum deterrence. For example, U.S. Naval Forces Europe supported Exercise Baltic Operations with combined-joint forced liminal landing and expanded maritime patrols in the Black Sea. Additionally, U.S. Marine Forces Europe used Exercise Cold Response as a learning campaign to insert and sustain a permanent contingent of Marines in Norway. This enhanced the robustness of Black Sea Rotational Force training.

U.S. Air Forces in Europe enlarged its role in the Baltic Air Policing program, while U.S. Army Europe undertook its most significant land-based exercises since the end of the Cold War: Dragoon Ride, Swift Response 15, Saber Strike 15, Trident Juncture 15, and Anakonda 16. These exercises provided lessons about the coordination and movement of forces throughout the theater.

Analyses of lessons learned from these multinational exercises and continuous joint operations have enabled the ECJ4 to establish a framework prioritizing efforts to further set the theater. These five categories are now articulated in the new EUCOM Mobility Strategy:

- ☐ Joint command, control, and coordination.
- ☐ Joint access.
- ☐ U.S. organic capability.
- ☐ Infrastructure.
- ☐ European partner commercial capacity.

Joint Command, Control, and Coordination

The effectiveness of the U.S. logistics capability starts internally. The most significant operational challenges in the European theater are to streamline communications, enhance

The U.S. European Command Logistics Directorate is working with its NATO partners to improve five areas that set the theater for the joint force.

visibility, and synchronize planning and operations. At the strategic level, Exercise Austere Challenge 2015 and 2017 demonstrated the need to integrate visibility and the flow of information between the EUCOM headquarters in Stuttgart, Germany, and the service component headquarters scattered throughout Europe.

Control of joint logistics and support of joint operations are critical in accomplishing the combatant commander's operational objectives and desired outcomes. Joint Publication 4-0, Joint Logistics, encapsulates the importance of this point succinctly when it says that the combatant commander "exercises effective control of joint force logistics by fusing procedures and processes to provide visibility and control over the logistics environment, and integrating joint logistics planning with operations planning."

Successful combat support in the future relies on revolutionizing information integration across the defense enterprise and JLEnt. This includes integrating unity of effort horizontally across business processes at the geographic combatant command and service component headquarters, vertically to trace units and combat support regional offices, and diagonally to supporting geographic combatant commands, functional combatant commands, service headquarters, the Joint Staff, and the Office of the Secretary of Defense.

The JLEnt continues to pursue a global common operational picture for multiple and interconnected theaters in order to provide agile solutions and enable flexible actions.

Joint Access

Intratheater mobility is critically important for a theater as complex as the one in Europe. With 54 sovereign nation boundaries in the EUCOM area of responsibility, plus the European Union's own set of requirements, logisticians must contend with access, movement, and sustainment regulations similar to those in the United States, with its overlapping city, county, state, and federal regulations.

This must be taken into account when planning and executing important logistics operations such as ordnance storage, unit movements, acquisition and cross-serving agreements, customs clearances, multimodal connections, road and rail variations, and aerial port and seaport management.

What EUCOM is seeking in its mobility strategy is greater freedom of assembly and movement, where the joint force and NATO allies can quickly move to and through the theater. This would optimize force assembly, movement, integration, and sustainment.

Authorizations for commercial airlift, sealift, and surface transport for the joint force are regulated by separate regulatory tracks. Modifying authorizations to synchronize them with surface movement legislation and governing policies would create significant flexibility in chartering multidomain, intratheater movements that could be directed by a single command.

Resolving logistics access in Europe also requires standardizing the movement of the joint force and developing a resilient and validated hub-and-spoke distribution capability to support JRSOI, force projection, and sustainment of an ancillary network of multimodal sea and aerial ports of debarkation to augment host-nation bases.

Creating redundancy creates resiliency for the joint logistics community. Additional concerted efforts by EUCOM headquarters, NATO agencies, and EUCOM's service components are driving solutions by expanding beyond legacy best practices.

These initiatives include a geographic combatant command-level mobility working group (battle rhythm), development of a long-range theater mobility vision, mobility-focused tabletop exercises, logistics infrastructure data sharing between NATO logistics partners, a broad-spectrum analysis program to assess theater mobility capacity, and bolstered NATO-European Union coordination of movement and distribution policies in the theater.

Capability and Infrastructure

By fiscal year 2017, ERI funds were supporting deterrence activities. Building U.S. and NATO logistics resilience by investing in organic capabilities is key to deterrence. To achieve this, each EUCOM service component receives funding to enhance niche logistics support and strengthen interoperability.

The services are also improving organic capability by pre-positioning assets in theater. The Army is investing $1.5 billion in pre-positioned materiel. The Navy is not only undertaking improvements to its multimodal facilities at Rota, Spain, and Souda Bay, Greece, but it is also ensuring all U.S. services and NATO allies can use the facilities to support multinational operations.

Also, the Navy is set to provide an increased presence by flying P-8A Poseidon aircraft, with improved support capabilities, out of Iceland's Keflavik International Airport. This will provide Iceland with a critical anti-submarine and anti-surface warfare capability in the Greenland-Iceland-United Kingdom maritime gap.

The Marine Corps is modernizing its pre-positioned program in Norway to ensure that stockage levels are adequate and that its newly established detachment based there is able to maintain a high state of readiness.

By developing munitions storage sites for the first time in decades, the Air Force is aggressively upgrading enduring bases. At the same time, it is enlarging NATO's aerial port network to accommodate more diverse fighter and mobility aircraft and its own pre-positioned stocks. This effort requires a substantial buildup of aircraft hangars, bulk fuel storage facilities, and pipelines and the modernization of flight lines, runways, and parking aprons.

Throughout fiscal year 2017, 28 joint and multinational exercises in 40 European countries, the buildup of four NATO Enhanced Forward Presence multinational battlegroups in the Baltics, and overlapping deployments of rotating armored brigade combat teams and combat aviation brigades will test, validate, and offer proof of principle for these infrastructure and organic capability investments.

Commercial Capacity

Despite the logistics breadth of the ERI, no dollar amount can completely set the European theater for a high-throughput contingency. A key takeaway from Anakonda 16 is that the United States and its NATO allies and partners must lean on commercial firms to help deliver a full spectrum of logistics support to the warfighter. This logistics support includes maintenance, supply, field services (base operating support), transmodal and multimodal transportation, distribution, operational contract support, and general engineering support.

Commercial logistics companies have a vested interest in teaming with the joint force because the globalized economy depends on political stability. In late 2016, the commanding generals of U.S. Army Europe and the 21st Theater Sustainment Command initiated a new level of open communication with the largest rail provider in Europe and second largest transport company in the world. The intent of this communication is to strengthen partnerships to hasten speed of assembly in the European theater.

Paired with a mature transportation network, the joint force and NATO partners can enhance readiness and asset availability through closer integration and interoperability with host-nation logistics firms.

The ECJ4 and the Joint Staff J-4 are pursuing an initiative that is making the European theater a testing ground for the mapping of key cyber terrain. This program seeks insights into resiliency of the intratheater transportation network based on analysis of the cyber and critical infrastructure nexus.

The JLEnt's impact on land, sea, and air domains has been noteworthy, especially in the progress made by key partners such as the Army Materiel Command, its Research, Development and Engineering Command, and the 21st Theater Sustainment Command.

EUCOM has been particularly successful through a closer partnership with the Army Materiel Command. This has borne fruit most clearly in Army pre-positioned stock management, which is now transforming to enable speed of assembly by suppling more secondary items for warfighters and ensuring a "fight tonight" capability for an array of contingencies.

European security and global stability depend on the success of a joint force that is supported by a first-rate JLEnt. Just as logistics innovation is best ensured through JLEnt synergy, the defense of NATO allies and Europe as a whole is best undertaken through genuine unity of effort. While the sheer size of such an integrated approach is a challenge, teamwork within the JLEnt makes credible deterrence possible.

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Capt. Matthew A. Gaumer is a defense strategy analyst for the Russia Strategic Initiative, EUCOM. He holds a bachelor's degree in philosophy from Loyola University Chicago, a master's degree in theology from Saint Meinrad School of Theology, an advanced master's degree in theology from the University of Leuven, a master's degree in transportation and logistics management from American Military University, and doctorate degrees in history and sacred theology from the University of Leuven. He is a demonstrated master logistician and a graduate of the Transportation Basic Officer Leader Course and Combined Logistics Captains Career Course.

Ensuring Materiel Readiness for the Joint Force

Soldiers deployed with D Company, 3rd Battalion, 509th Infantry Regiment, eat their Thanksgiving meal at Combat Outpost Cherkatah, Khowst province, Afghanistan, on Nov. 26, 2009. (Photo by Sgt. 1st Class Andrew Smith)

Defense Logistics Agency Troop Support provides the joint force with needed supplies to accomplish the mission.

■ By Brig. Gen. Charles R. Hamilton

Defense Logistics Agency (DLA) Troop Support provided $14.5 billion worth of materiel to the joint force and other customers in 2016. But the agency's support to the services goes all the way back to the Lewis and Clark expedition and to outfitting Union Soldiers for the Civil War.

DLA Troop Support provides strategic acquisition of materiel for the joint force. Based on the services' needs, acquisition professionals use their supply chain expertise to work with DLA's industry partners to fulfill those requirements. The strategic contractual relationships DLA Troop Support has with industry partners are designed to ensure the materiel readiness of the joint force.

However, DLA Troop Support has evolved from being a strategic enabler. Its workforce has taken on more tactical responsibilities to ensure warfighters have what they need, when and where they need it. No longer does DLA Troop Support's job end when a contract is awarded. Now its team is involved at every point of the process until the product is in the hands of the Soldier, Sailor, Airman, or Marine.

"Stratactical" Support

I have started using the term "stratactical" to describe how DLA Troop Support is more tactical than ever before, ensuring end-to-end logistics support. Here is how I define it:

Stra·tac·ti·cal *adj.* operating across the full spectrum of levels of war, from factory to foxhole.

DLA Troop Support's stratactical support begins with strategic acquisition processes and extends to tracking shipments, working customs issues, and answering phone calls from special operators in sensitive locations.

DLA Troop Support has been feeding U.S. troops in Afghanistan since 2001. It ensures class I (subsistence) readiness through its strategic subsistence prime vendor contract. Through this model, the shelves stay stocked at forward operating base (FOB) dining facilities and Soldiers in remote mountain locations have meals ready-to-eat.

A few months ago, when the only road from Kandahar Airfield to FOB Dwyer could not be used, DLA forward logistics specialists in Afghanistan helped find a tactical solution. They worked with Army sustainers and the prime vendor for the contract in Afghanistan to quickly arrange an airlift. Unit class I supply remained steady, and the troops at FOB Dwyer received their holiday meals on time.

Tailored Support

DLA is the Department of Defense's largest combat support agency. DLA Troop Support, one of six DLA primary-level field activities, ensures joint force readiness by providing materiel that Soldiers, Sailors, Airmen, and Marines use every day, including food, uniforms, medical supplies, protective equipment, and equipment repair parts.

DLA Troop Support's relationships with the services allow it to provide the best customer support possible. The better the agency understands its customers, the better it can tailor its acquisition processes to serve them. Engaging each service and combatant command provides DLA Troop Support with the awareness necessary to anticipate customers' mission requirements.

Plugging DLA Troop Support into strategic planning helps guide its acquisition strategies and craft its global support capabilities. With more than 2,900 civilian and military employees, DLA Troop Support has a forward presence throughout the United States and around the world that helps customers reach the best logistics solutions, no matter what the requirement is.

DLA Troop Support employees are located in each theater of operations, including Southwest Asia, Africa, and the Pacific. Having boots on the ground, such as the forward logistics specialists who supported FOB Dwyer, promotes open communication between DLA Troop Support and

Recruits at Fort Jackson, South Carolina, lace up their new boots during basic training. Defense Logistics Agency Troop Support employees prepare months in advance to support the summer surge of new recruits that takes place between July and September. (Photo by Andrew R. McIntyre)

the joint force, allows DLA Troop Support to adapt quickly to changes, and decreases the wait time from requirement submission to the delivery of mission-ready equipment and supplies.

One DLA Button to Push

As a whole, DLA manages more than 5 million items within nine supply chains and conducts distribution and disposition operations. Despite DLA's massive size, customers can push one button to access its buying power and first-class customer support from military and civilian personnel in 48 states and 28 countries.

DLA's regional commands are aligned with their respective geographic combatant commands and are dedicated to serving their respective areas of responsibility. These regional commands are positioned geographically to provide effective and efficient support to warfighters' day-to-day operations, especially in a contingency.

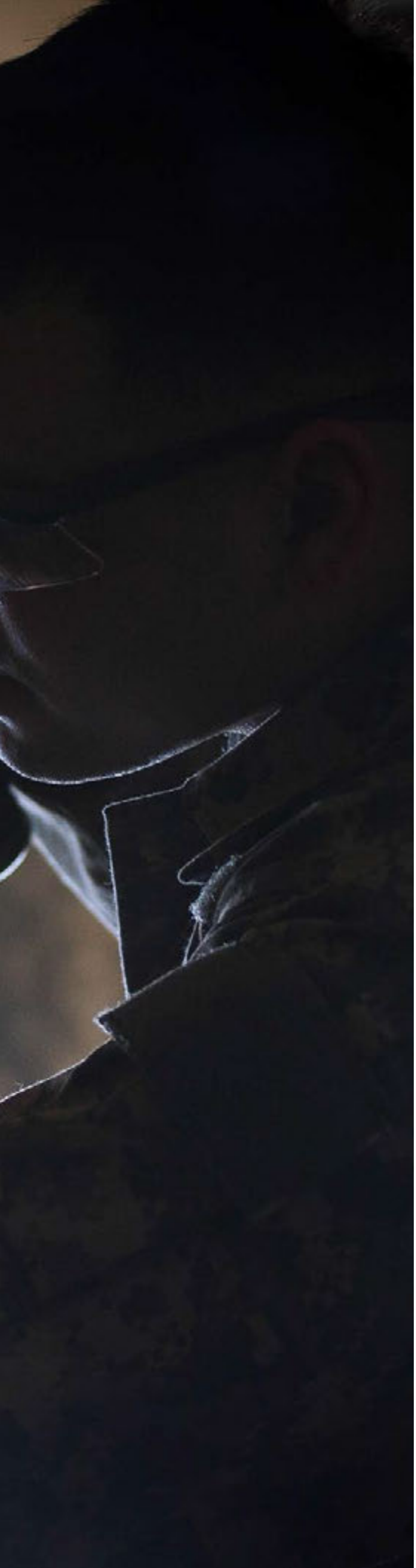
When customers have an urgent requirement for supplies to help in the fight against an enemy in the Middle East, they can initiate DLA support through DLA Central. If support is needed in response to a tsunami in Asia, DLA Pacific is the entry point. Those customer entry points simplify DLA engagement for customers, which stabilizes and enhances support. It also enriches support for expeditionary and emergency capabilities by providing regional commands with the ability to reach back to DLA's supply chain experts.

DLA Troop Support provides more than $14 billion worth of food, clothing and textiles, construction and engineering equipment, pharmaceuticals, medical supplies and equipment, and industrial hardware items for U.S. warfighters and other valued customers worldwide.

Brig. Gen. Charles. R. Hamilton is the commander of DLA Troop Support. He holds a bachelor's degree in business administration from Virginia State University, a master's degree in public administration from Central Michigan University, and a master's degree in military studies from the Marine Corps University. He is a graduate of the Quartermaster Basic and Advanced Courses, the Marine Corps Command and Staff College, the Combined Arms and Services Staff School, and the Joint Forces Staff College. He is also a 2012 Office of the Secretary of Defense corporate fellow, and he has completed the Airborne, Air Assault, and Rigger Schools.

For more information on DLA support, visit http://www.dla.mil.

Pvt. Jacob Mayor, an Arizona Army National Guard utilities and equipment repairer, installs the spider gear on the hub of a M1078 light medium tactical vehicle on March 16, 2017, at the TACOM LCMC Fleet Management Expansion Directorate at Fort Benning, Georgia. (Photo by Staff Sgt. Brian A. Barbour)



How TACOM Supports the Joint Fight

■ By Maj. Gen. Clark W. LeMasters

The TACOM Life Cycle Management Command (LCMC) is one of the Army Materiel Command's (AMC's) three LCMCs. Its mission is to deliver sustainable readiness by operationalizing essential functions at the tactical, operational, and strategic levels.

TACOM provides support across the life cycles of major end items, which are the critical systems that enable the Army to perform its missions. Many of these major end items are employed by other services within the Department of Defense.

These items include the M1 Abrams tanks used by the Marine Corps, the mine-resistant ambush-protected (MRAP) vehicles used by the Air Force and Navy, and the small arms used by the Coast Guard. If a sister service uses a TACOM-supported major end item, TACOM will provide some level of support to that joint partner.

TACOM's Role

Sustainment is a team sport. As an LCMC, TACOM is an active member of the Army acquisition team and is partnered with supported program executive offices (PEOs) for major systems and capabilities. The PEOs and their subordinate program managers acquire major end items and capabilities for the force, and TACOM teams with them to sustain the equipment once it is fielded.

TACOM is also closely linked with the Defense Logistics Agency (DLA), a major joint partner that provides critical repair parts and secondary items to support the systems that TACOM is responsible for.

The most common types of support TACOM provides to joint partners fall within one of the following five essential functions: materiel fielding

support, the Logistics Assistance Program (LAP), supply chain support, organic industrial base (OIB) support, and the Fleet Management Expansion (FMX) program.

Materiel Fielding and Training

Within TACOM's Field Support Operations Directorate, the Materiel Fielding and Training (MF&T) Division is responsible for fielding state-of-the-art equipment to units. The MF&T Division also provides training on the proper operation and maintenance of this equipment.

The MF&T team can support any service that receives equipment acquired by one of the TACOM-supported PEOs. So far in fiscal year 2017, the MF&T team has performed more than 433 new equipment training events and supported the fielding of 169 systems across 19 program managers. Some of the support went to joint partners in the Marine Corps, Navy, Air Force, and Coast Guard.

Logistics Assistance Program

The LAP is an Army program managed by the Army G-4. AMC executes the program through its subordinate commands. The LAP focuses on the early detection and resolution of logistics-related problems that affect units and materiel readiness. This program provides commanders with the technical support necessary to fix weapon systems, equipment, and systemic sustainment problems.

The LAP is executed by logistics assistance representatives (LARs). These Department of the Army civilians are experts who assist field commanders in solving readiness issues at the unit level. They also elevate issues when necessary to the Army Sustainment Command or one of the three LCMCs within AMC.

TACOM has 291 LARs in the program. The LARs are located at every major Army installation around the world, to include commands at the theater, corps, division, and brigade levels. LARs support every major exercise, training event, and contingency. The TACOM LARs are aligned with Army field support brigades.

> Although TACOM's primary mission is to deliver readiness for the Army, its support to the joint force enables readiness for the Marine Corps, Navy, Air Force, and even occasionally the Coast Guard.

The LARs have diverse skills and experiences, but they each focus on one of these seven primary areas of expertise:

- ☐ Automotive-tactical.
- ☐ Automotive-combat.
- ☐ Automotive-engineer.
- ☐ Armament-artillery/small arms.
- ☐ Armament-armor/fire control.
- ☐ Armament-aircraft.
- ☐ Soldier/biological/chemical.

Although TACOM LARs are not permanently stationed or positioned to support the Marine Corps, Navy, Air Force, or Coast Guard, on many occasions, LARs provide support to other services for TACOM-supported equipment. This primarily occurs during contingency operations or joint exercises in which joint forces are operating in close proximity.

It is not uncommon for LARs stationed at or near a joint military base to receive calls from other services for equipment support. On the joint battlefield of today and into the future, TACOM LARs will provide support to Army and joint force units. TACOM LARs ensure that every service member operating TACOM-supported equipment has the highest level of support possible.

Supply Chain Support

TACOM equipment, weapons, and support systems are expertly maintained by well-trained operators and crews. Supply chain management is one of the most essential functions that the TACOM team performs. This support extends down to the tactical level for all services.

The largest portion of TACOM's DLA support comes from DLA Land and Maritime, located at Defense Supply Center Columbus, Ohio. DLA Land and Maritime manages nearly 80 percent of all secondary items and repair parts for TACOM systems, and TACOM manages the remaining 20 percent of those items. Sister services rely on both DLA and TACOM to provide repair parts and secondary items for their TACOM-supported equipment.

TACOM manages nearly 7,300 items that support the other military services. Some examples include 2,300 items supporting Marine Corps howitzers, 674 chemical and biological items for all services, and light and medium tactical truck repair parts for the Air Force.

The supply chain support that TACOM provides for these items requires close coordination with sister services to determine demand requirements, procurement through contracting or repair at one of TACOM's OIB sites, and parts management, which includes receipt, storage, and issue. This is a complex and challenging business managed expertly by the Integrated Logistics Support Center located at TACOM's headquarters in Warren, Michigan.

OIB Support

As part of the AMC OIB enterprise, TACOM is responsible for three depots and two arsenals. It is also responsible for the Joint Systems

Manufacturing Center–Lima in Ohio, also known as "the tank plant," which is a government-owned, contractor-operated facility.

The OIB sites include Anniston Army Depot, Alabama; Red River Army Depot, Texas; Sierra Army Depot, California; the Joint Manufacturing and Technology Center (JMTC) at Watervliet Arsenal, New York; and the JMTC at Rock Island Arsenal, Illinois.

Arsenals manufacture and depots remanufacture major end items and components that support the military. Some of the components they provide are critical repair parts that support TACOM's supply chain. These parts include recoverable items such as engines, alternators, and axles.

JMTC at Watervliet Arsenal produces all large cannon barrel assemblies for 155-millimeter artillery, the 120-millimeter main gun for the M1 tank, 105-millimeter cannon assemblies for incorporation into artillery or direct-fire systems, and mortar systems and related support components.

The JMTC at Rock Island Arsenal has multiple capabilities, including tool and gauge manufacturing, casting, forging, gear and spring manufacturing, and pliable materials capabilities.

Sierra Army Depot has more than 30,000 acres of open storage and nearly 2.5 million square feet of magazine and warehouse space to hold major end items and materiel awaiting service-level disposition.

These capabilities and many more are available to the joint force. TACOM's OIB sites receive work annually from the Marine Corps, Navy, and Air Force. This work equates directly to readiness and increased capabilities within the Army and its sister services.

Some examples of joint OIB support include overhauling Marine Corps tanks and assault breacher vehicles, manufacturing 81-millimeter mortar tubes and thousands of shoes for Marine Corps assault amphibious vehicle tracks, rebuilding machine guns for the Air Force, and overhauling mine-resistant ambush-protected vehicles and casting work for the Navy.

Fleet Management Expansion

The FMX program began in 2002. Since then it has evolved to provide responsive, reliable, and uninterrupted field-level maintenance for equipment used for training by the Training and Doctrine Command.

TACOM's FMX program is focused on four locations: Fort Jackson, South Carolina; Fort Lee, Virginia; Fort Benning, Georgia; and Fort Leonard Wood, Missouri. The FMX team repairs equipment at these locations, which are used to train tens of thousands of defense personnel each year.

At Fort Leonard Wood, the FMX team supports Marine Corps and Navy detachment equipment used to train Marine Corps military police and motor vehicle operators and Navy engineers. At Fort Benning, the FMX team supports four assault breacher vehicles and 16 M1 tanks used for training Marines.

At Fort Jackson, the FMX team supports more than 2,400 small arms used by the Navy. At Fort Lee, the team supports equipment used to train Marines and Airmen operating and maintaining various materials handling and support equipment.

Other Programs

TACOM also manages some very unique programs that support the joint force. Its Soldier Product Support Integration Directorate manages force provider and large area maintenance shelters within Army pre-positioned stocks and war reserves. These systems provide critical life support and maintenance areas in deployed environments and support joint operational needs statements around the globe.

Dozens of force provider base camps and large area maintenance shelters have been used by Marine Corps, Navy, and Air Force units during Operation Inherent Resolve and Operation Noble Eagle. The systems are part of the critical infrastructure the Army brings to build up and sustain theater operations. Program manager and TACOM equipment specialists deploy to support the systems and train service members on maintaining and operating them.

TACOM's Aerial Delivery and Soldier Protective Equipment Branch provides equipment to support cargo airdrops. This equipment includes the joint precision airdrop system, which is used by several services.

TACOM also has occasionally coordinated for field support representatives from the original equipment manufacturers to support unique joint service requirements when a TACOM LAR was unable to provide support.

TACOM's support across these essential functions varies in size and scope from service to service. Although TACOM's primary mission is to deliver readiness for the Army, its support to the joint force enables readiness for the Marine Corps, Navy, Air Force, and even occasionally the Coast Guard.

The TACOM team of sustainment professionals, linked with its many partners, provides sustainable readiness solutions globally. TACOM's motto is "Committed to Excellence," and it is committed to providing the absolute best support to service members wherever and whenever they need it.

Maj. Gen. Clark W. LeMasters is the commanding general of the TACOM LCMC. He has a bachelor's degree in chemistry from Frostburg State University and master's degrees from the Florida Institute of Technology and the Army War College. His military education includes the Ordnance Officer Basic and Advanced Courses and the Army Command and General Staff College.

Iraqi security forces receive a shipment of more than 70 up-armored humvees on June 28, 2015, at Camp Taji, Iraq, as part of a foreign military sales effort to assist in their fight against the Islamic State group. (Photo by Capt. A. Sean Taylor)

USASAC Plays the Long Game in the FMS Life Cycle

■ By Maj. Gen. Stephen E. Farmen

As I conduct key leader engagements and attend combatant command (COCOM) forums throughout the world, I cannot go anywhere without hearing this recurring theme: Security assistance and building partner capacity are essential to Army readiness.

As the Army Materiel Command's executive agent for security assistance and building partner capacity through foreign military sales (FMS), the U.S. Army Security Assistance Command (USASAC) is supporting COCOMs and bolstering the Army's ability to sustain readiness on multidomain battlefields. Simply put, COCOMs set USASAC's priorities and drive requirements, and USASAC's outputs enable strategic readiness.

Through trust, teamwork, transparency, and the Total Package Approach (what I call the 4T's) USASAC successfully manages more than 5,000 FMS cases in more than 150 nations. These cases have a total value of more than $177 billion. Despite this staggering tally, USASAC's security assistance mission is not about the dollars. It's about the effects and outputs delivered.

Through FMS cases, the United States enters into contracts with allied nations and organizations to provide them materiel, including some of the world's most sophisticated weapons and equipment. This materiel transforms previously reliant nations into mission partners that help our globally engaged Army provide expanded capability and capacity to COCOMs.

The United States wants as many teammates as it can muster to bolster strategic readiness and share the burden. As our globally engaged Army prepares to fight alongside its international partners across multiple domains and in nontraditionally contested areas, international partners must also be prepared.

Interoperability and the ability for partners to be self-sustaining with the capabilities USASAC has provided are the true testaments of success. That is why USASAC focuses on the long game.

The Total Package Approach

USASAC's security assistance mission is a perpetual operation that touches every phase of life cycle management, from gathering requirements to negotiating contracts, and acquiring, delivering, and sustaining equipment. Managing such a large and complex enterprise requires USASAC's FMS experts to pay strict attention to each step of the life cycle. The cycle begins with a partner nation's letter of request for equipment and services and ends with sustainment. (See figure 1 on page 40.)

Sustainment is critical because the lack of a viable concept of support can result in failed FMS cases. Failed cases can have serious implications and strain the Army's and a COCOM's relationships with mission partners. A solid concept of support not only fuses relations with international teammates and empowers strategic readiness; it also allows the Army to operate more quickly and effectively in support of COCOMs.

In accordance with COCOM requirements, partner nations receive more than just equipment through FMS. The FMS process comes with USASAC's Total Package Approach, which includes refurbishment, training, facilities, spare parts, publications, maintenance, logistics support, and other services to ensure each capability.

Providing materiel without sustainment services can transform a brand new tank or helicopter into a large paperweight. The Total Package Approach is what makes USASAC and the Army different from other competitors in the FMS market and industry. USASAC doesn't just provide equipment and "cut sling-load." It shares the risk and remains with its partners for the long game.

A successful total package brings about successful joint and coalition operations. The United States depends on partner nations to have interoperable weapon systems that can aid in deterring and defeating its adversaries. Systems must be able to communicate operationally and tactically and work in unison. If an international partner is using a different system configuration with outdated software, the potential for the system to share accurate data is slim to impossible.

Thanks to the FMS process that provides U.S. materiel and the associated training and support, participants in coalition operations can rest assured that their international partners have the necessary capability and knowledge to successfully conduct missions and fulfill their share of the tasks.

The Total Package Approach begins long before, and continues long after, partner nations receive purchased materiel and equipment. USASAC manages the concept of support and

sustainment closely for every case, especially COCOM priority cases.

If a country begins to neglect its commitment to the sustainment line of effort, then USASAC personnel immediately notify the COCOM and requisite Army service component command. These entities, along with the embassy country team and security cooperation officer, can engage the country's leaders to influence their line of thinking. These engagements are key to helping the Army operationalize capability and capacity with its mission partners.

A viable and successful FMS concept of support is discussed early in requirements determination. USASAC's country program managers, logistics specialists, and the Army Materiel Command security assistance enterprise system experts guide international partners in developing long-term sustainment solutions.

From spares to maintenance to training to publications and even to the sustainment of nonstandard equipment, FMS experts bring specialized and focused expertise to develop and tailor the best solutions for international partners based on their requirements and sustainment structure.

Spares

Spare parts are furnished by contractors or purchased through FMS cases. Partner nations also buy into the wholesale logistics system through cooperative logistics supply support arrangements based on forecasted recurring demands. Items are prestocked and requisitioned as needed.

Spare parts may also be obtained when partners purchase technical data packages for in-country manufacturing through the Army's simplified nonstandard acquisition process or through the Air Force's Parts and Repair Ordering System.

A system support buyout notification informs international partners of the Army's intent to stop supporting a system two years prior to the termination. This is an opportunity for partners to take advantage of a one-time option to buy lifetime spares.

Foreign Military Sales (FMS) Concept of Support Total Package Approach Options

SPARES	• Concurrent spare parts as a line on FMS case • Cooperative logistics supply support arrangement • Separate blanket order of spares for FMS case
MAINTENANCE	• Technical assistance fielding team (TAFT) • Repair and return for components • Contract field service representatives (FSRs) • Contractor logistics support package
TRAINING	• Letter of offer and acceptance includes new equipment training for new capabilities • TAFT or a mobile training team • Training by contracted FSRs • Training by Security Assistance Training Field Activity or Security Assistance Training Management Organization
DOCUMENTATION	• Separate FMS publications case • Tech data package if releasable
NONSTANDARD EQUIPMENT	• Shelf-life extension plans • Fair Share Sustainment Program opportunity • Simplified nonstandard acquisition process for spares

Figure 1. The Total Package Approach is offered as part of FMS sales. Countries may modify the approach based on their requirements and budget.

Shelf-life extension plans are recommended to extend the life cycle of a weapon system. The original equipment manufacturer may also provide services.

Maintenance

USASAC offers options for the continual, long-term sustainment and maintenance support of obsolete systems through the Fair Share Sustainment Program and the International Engineering Services Program. In fact, sometimes several FMS customers join together to support the program management of an obsolete system.

International partners may have a maintenance capability in country based on previous FMS sales. In addition, the FMS case may include mobile training teams, field service representatives from the equipment manufacturer, contracted logistics support, field and intermediate maintenance support, maintenance augmentation teams or maintenance support services, institutional Army maintenance training (from the Training and Doctrine Command), postproduction system support, and depot and contractor repair-and-return processes for components.

Training

The training support included in an FMS case depends on the international partner's requirements. Cases include new equipment training when new systems are introduced. Contract field service representatives from the manufacturer may also provide training.

Other frequently used resources include mobile training teams, postproduction system support services, and various stateside and overseas training options provided by the Training and Doctrine Command's Security Assistance Training Field Activity and USASAC's Security Assistance Training Management Organization.

The Security Assistance Training Field Activity manages Army institutional training solutions for international military students. It receives, processes, and executes requests for

Army institutional FMS training and technical assistance and develops training plans that are synchronized with equipment fielding.

The Security Assistance Training Management Organization at Fort Bragg, North Carolina, provides maintainer training, logistics support training, and on-the-job training. It also offers best practices regarding the sustainment of equipment based on international partners' current experiences and capabilities and offers agile, flexible, and cost-effective training teams that provide tailored and specialized security assistance training at overseas locations.

How FMS Works

In every FMS case, USASAC's total package is the element that transforms purchased materiel into a real capability. For example, in Iraq, the M1A1 Abrams is playing a crucial role in the ongoing fight to liberate Mosul.

Iraq obtained 150 tanks several years ago through the FMS process. But USASAC, in cooperation with the AMC Security Assistance Enterprise, the Office of Security Cooperation-Iraq, Combined Joint Task Force-Operation Inherent Resolve, and other theater partners, also provided training to the crews, contracted logistics support (even during combat operations), and spare parts for the equipment at a rate sufficient for combat operations.

Iraqi nationals are now in the process of building in-country maintenance expertise. The COCOM and theater partners continue to work with the Iraqi army to develop on-the-job training for Iraqi tank maintainers.

Through its security assistance enterprise, USASAC also provided thousands of rounds of ammunition, recovery vehicles, spares, and maintenance for the tanks. It even provided fuel trucks and a fleet of support vehicles (trailers and the aforementioned recovery vehicles) to move tanks from place to place.

In addition to the large number of vehicles USASAC and its team of teams provided to Iraq after many of its vehicles had been destroyed in Mosul, USASAC provided contractor logistics support and spares for armored bulldozers and uparmored humvees. This was only possible through close coordination with the TACOM Life Cycle Management Command and private industry, another set of partnerships vital to the security assistance process.

The Total Package Approach for the Kingdom of Saudi Arabia's Patriot Advanced Capability program seamlessly introduces a new component as part of an integrated, overarching ballistic air and missile defense solution. Saudi Arabia is one of the Army's long-time partners and is engaged in an extended conflict. Without the Total Package Approach, Saudi Arabia would obtain the major end items but would not have the skills to employ, train, maintain, or sustain the world's most advanced system, whether for training or for air defense engagement.

Essential elements such as training programs and publications introduce Royal Saudi Air Defense Forces operators to a familiar but new deterrent while spares and maintenance keep the fire units operational. This capability provides Saudi Arabia with a means to protect its citizens and infrastructure and to save lives. Since the program started, Saudi Arabia has expanded capabilities, become increasingly self-sustaining, and become more capable of helping the United States carry the load.

USASAC is building partner capability and deterring adversaries by providing capabilities for international partners. It is operationalized to deliver readiness in support of the Army's priorities and COCOM requirements through the building partner capacity line of effort. Its effectiveness in this generates forward presence, forward power, and military-to-military engagements.

> USASAC enables international partners with the capabilities and capacities to execute combined arms operations in multidomain and multinational environments.

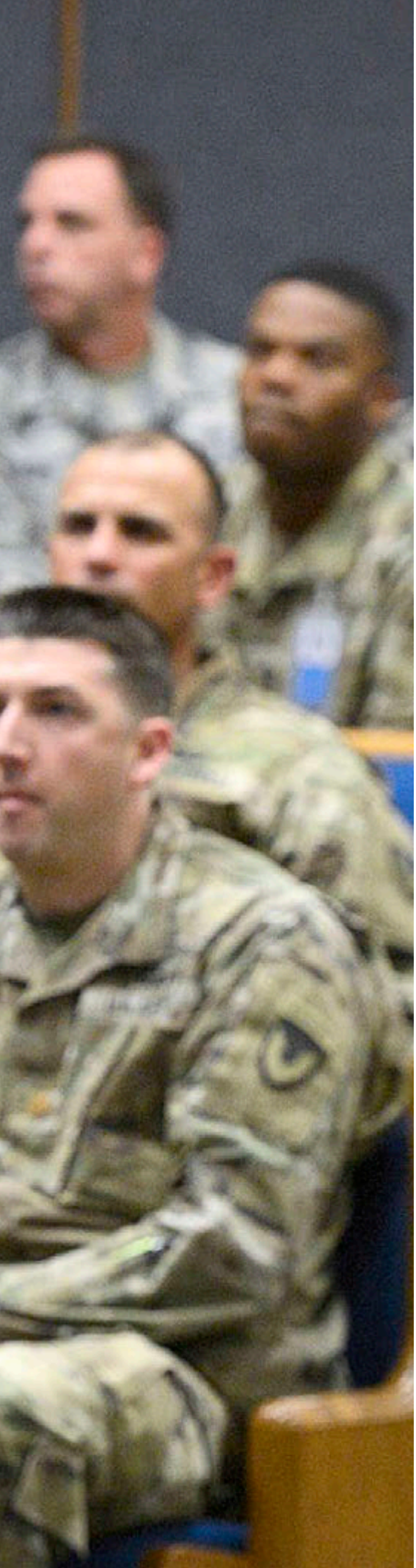
USASAC is globally engaged and fully supports COCOM missions. During the FMS process, it offers excess defense articles that enable coalition interoperability as part of the Total Package Approach.

USASAC enables international partners with the capabilities and capacities to execute combined arms operations in multidomain and multinational environments. It is the Army's "face to the world" as it strengthens its partner nations' capabilities and capacity to achieve regional stability and promote democratic values.

When the Army gets it right and the long game is intact, it enables strategic readiness. This aligns with USASAC's motto: Trust+Teamwork=Strength in Cooperation!

Maj. Gen. Stephen E. Farmen is the commanding general of USASAC. He holds a bachelor's degree in history from the University of Richmond and a master's degree in national security and strategic studies from the Naval War College. He is a graduate of the Transportation Basic and Advanced Courses, the Naval Command and Staff College, and the Joint Forces Staff College. He also served as a Senior Service College fellow at the Massachusetts Institute of Technology's Center for Transportation and Logistics.

Brig. Gen. Paul Pardew, commanding general of the Expeditionary Contracting Command, briefs Soldiers participating in Operational Contract Support Joint Exercise 2017 on the status of the contracting career field on March 17, 2017, at Fort Bliss, Texas. (Photo by Tech. Sgt. Chad Chisholm)



Joint Operational Contract Support Challenges

■ By Brig. Gen. Paul Pardew, Mike Rector, and Bill Sanders

The Department of Defense (DOD) uses operational contract support (OCS) to plan, procure, and manage contracts for its operations. OCS doctrine, found in Joint Publication (JP) 4-10, Operational Contract Support, is intended to drive the services toward a more joint, efficient, and effective means of planning, executing, and managing contracted support.

Doctrinally, OCS is organized into contract support integration (CSI), contract support (CS), and contractor management (CM). CSI consists of planning and defining requirements. CS is the actual procurement and execution of the contract. CM is the oversight of the contracted effort.

The primary challenges with OCS across all operations are actually found in the CSI and CM aspects of OCS. That is not to argue that CS has no problems; but operationally, the more significant challenges to commanders in the field are OCS planning and oversight.

CSI Challenges

The first challenge to OCS is the lack of OCS planning for the total force. The total force includes DOD military personnel, civilians, and contractors. Contractors are rarely planned for adequately.

Unit task organizations, time-phased force deployment data, and operational planning include military units and strengths but rarely take into account the contracts or the size of the contract footprint required to support an operation. Using contractors involves multiple planning considerations and can have tremendously negative impacts on an operation if they are not accounted for sufficiently.

In overseas theaters, the military has a responsibility to provide government support to contractors who are not local nationals and who reside on U.S. operating bases. They are referred to as contractors authorized to accompany the force. Often, planning efforts fail to account for these contractors, and thus, base life support and other requirements are underestimated.

Conversely, by identifying in the planning process services and commodities that are available locally (part of OCS analysis of the oper-

ational environment), the military footprint required to execute an operation can be drastically reduced. Planning to use contractors involves many considerations, including security, life support, legal issues, and political factors.

An additional important consideration is whether or not commanders are sure that the contractor can fully support the operational timeline. Contractors rarely attend rehearsal of concept drills to synchronize their business timeline with the operational timeline. Those timelines must be synchronized, and that starts with OCS planning and requirements development.

The second challenge of CSI is contract visibility. Today, DOD-wide, personnel are effectively blind to their contracts. One of the principal characteristics of OCS is realizing efficiencies by minimizing similar contracts and leveraging existing contracts.

There is no effective system that supports the visibility of contracts to the level of fidelity needed for operations. OCS doctrine calls for a multifunctional staff called an OCS integration cell (OCSIC), but the cell lacks the capability to provide a common operational picture to the commander. The DOD has deployed several business systems, but they are not mutually supportive nor do they provide field commanders with holistic visibility of the contracts in their areas of responsibility.

This lack of visibility is evident across all services and operations. It results in inefficient use of contracts among the services and the misuse of limited resources. Moreover, these inefficiencies result in increased costs for contracted services and commodities.

The third challenge under CSI is the execution of a joint requirements review board (JRRB). This board validates requirements in support of operations. Many times the JRRB functions not as a validation board but as a "pursuit of requirements perfection" board, and the requirement is eventually removed from the operational timeline.

If the requirement is valid for the operation, then it should be approved and the staff should find a legal, moral, and ethical way to support it. Validated requirements must be prioritized and managed against resources.

Additionally, senior leaders seem to be risk-averse when it comes to approving requirements. Although being good stewards of taxpayer dollars and using money in an efficient and expedient manner is always the goal, supporting the warfighter is paramount. During contingencies, requirements validation approval must be delegated down (decentralized) to subordinate OCSICs to ensure operational responsiveness and flexibility.

Air Force 1st Lt. Jessica D'Ambrosio completes a simulated payment to contractor role player Senior Airman Michael Burkett at the Operational Contract Support Joint Exercise 2017 on March 20, 2017. (Photo by Tech. Sgt. Chad Chisholm)

CS Challenges

The challenges within the CS functional area of OCS are not in the execution of the contract but in the OCS constructs and authorities defined in doctrine. JP 4-10 allows for the formation of a lead service for contracting coordination (LSCC), a lead service for contracting (LSC), and ultimately a joint theater support contracting command. The problems center on the authorities given to the LSCC and LSC.

Despite designations from the combatant commander, most of the LSCC and LSC efforts fall apart because of how the services are funded and how they operate with their service contracting structures. The LSCC should give the services the ability to cross-coordinate to support an operation, but it lacks the authority to require a service do anything outside of its capacity or normal operations.

While the LSC construct somewhat minimizes this lack of directive authority, it presents other problems as the various service contracting activities do not readily prescribe to another service having the authority

to direct its contracting resources. In reality, there is a distinct lack of joint contracting, which exasperates the challenges of contracting efficiencies.

This lack of influence in either construct does not support the joint contracting support board, which the contracting community uses to deconflict competing efforts in order to support the warfighter more efficiently.

CM Challenges

CM is the third function of OCS and is usually the most problematic. The fact that DOD personnel are effectively blind in CSI plays out in CM execution. If you cannot see your contracts and contractors, then you cannot manage them or provide effective oversight. If you cannot manage and oversee this part of the total force, then you cannot guarantee the desired operational support required to meet the commander's intent.

This aspect of OCS also has a doctrinal deficiency. While CSI has the JRRB and CS has the joint contracting support board, no such board assists a commander in CM. The corrective measure is to establish a commander's contract review board (CCRB) at which subordinate staff or unit commanders brief contracts that support the operation.

The briefings should address five management areas:

- ☐ Contract description and life cycle.
- ☐ Period of performance and follow-on requirements.
- ☐ Contracting officer representatives (CORs) assigned to oversee the contract.
- ☐ COR monthly reporting.
- ☐ Overall contract performance.

The CCRB would ensure that the contract is overseen and performed, tie the contract to the command, and tie the contract to the operational plan and commander's intent.

The Positives

Despite the concerns about OCS, tremendous progress has been made over the past 10 years. OCS is gaining prominence as a mainstay for supporting contingency operations. Both the Army and the Air Force have designated OCS proponents. The Combined Arms Support Command has an OCS Training and Doctrine Command capability manager assigned for Army doctrine and organization development.

Combatant commanders have started to source OCSICs in the U.S. Africa Command, U.S. Central Command, and U.S. Pacific Command. During contingencies, OCSICs are now almost always established for joint task forces and commands and even in some subordinate task forces.

The Office of the Secretary of Defense and the Joint Staff continue to work to improve OCS systems across CSI, CM, and CS in order to address contract visibility and management issues. Training is improving with the Joint OCS Planning and Execution Course, the Army's OCS Course, and the Joint Staff-sponsored OCS Joint Exercise.

Recommendations

OCS has the most impact at the joint task force, corps, division, theater sustainment command, and expeditionary sustainment command levels. Combatant commanders set policy and guidance, but OCS execution, deconfliction, and management are at those levels. Commanders must plan for contracts and contractors and establish an OCSIC to manage this part of the formation.

Planners should establish, use, and leverage strategic sources and agencies in the battlespace. These include theater support contracts, the Army Logistics Civil Augmentation Program, Defense Logistics Agency Troop Support, and others. The solution does not always have to be service-centric; capabilities and capacities in the other services may in fact support an operation better. Joint solutions provide operational unity of effort and, in many cases, result in cost efficiencies.

Trained, responsible personnel should be assigned as CORs to manage and oversee contracted efforts. The JRRB should be used for validation, and some form of CCRB should be established to manage the contracted effort supporting the operation.

Units should increase their contact with their supporting contracting organizations. In the Army, these organizations are aligned with Army service component commands, corps, divisions, and brigade combat teams, but in a joint environment they may be aligned differently. Communication will ensure the contract executors know how they fit into the operational scheme and where a business timeline must fill an operational need.

If treated as a planned, synchronized, and integrated part of an operation, OCS will have a more positive impact on the overall operation. Commanders will appreciate the increased operating tempo, the taxpayer will appreciate the efficiencies, and the warfighters will be better supported.

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Mike Rector is an OCS planner with the Joint Contingency Acquisition Support Office, Defense Logistics Agency.

Bill Sanders is the director of resource integration in the U.S. Central Command J-4. He is a graduate of the U.S. Military Academy and holds master's degrees from Central Michigan University, the University of Maryland, and the Industrial College of the Armed Forces. He is a graduate of the Army Command and General Staff College.

Rear Adm. Scott Stearney, commander of the Joint Enabling Capabilities Command, describes to Lt. Gen. Kathleen Gainey, then deputy commander of the U.S. Transportation Command, and Lt. Gen. Darren McDew, commander of 18th Air Force, how his unit provides uninterrupted connectivity to joint operations around the world. (Photo by Julianne Sympson)

Simple Is Better in Joint Operations

Perspectives From Retired Lt. Gen. Kathleen Gainey

■ By Arpi Dilanian and Matthew Howard

Retired Lt. Gen. Kathleen M. Gainey knows joint logistics better than most people do. This 35-year Army veteran served as the deputy commander of the U.S. Transportation Command and as the director of logistics, J-4, of the Joint Staff during the Iraq and Afghanistan wars. Here are her views on the future of joint operations for the Army.

Can you talk about some of the benefits of serving in a joint assignment?

Serving in a joint assignment is like serving in another country. You learn about the culture, you learn different—and often better—ways of doing things, and you learn why they [the other services] operate the way they do. You learn to appreciate how they employ and sustain their weapon systems and how they depend on another service or agency for support.

This allows you to have a much more comprehensive view of the other services' needs, how they view the Army, and what you can do about it within your own organization now and in future assignments.

The friendships you build [in a joint assignment] will pay you immeasurable benefits later when you need to work with that service or any other in the future. It gives you credibility you would not otherwise have going into some other position later in your career.

What is the most important sustainment consideration that the Army should embrace for success in future joint and multinational operational environments?

What I learned most during my time in Iraq, at the Defense Logistics Agency, on the Joint Staff, and at the U.S. Transportation Command is that simple is better. The United States has very complex systems, processes, and organizations compared to other countries. We tend to overwhelm them when we come into an area and do not consider the impact we will have on their existing infrastructure, contracts for support, and workforce.

We need to do advance planning to look at who is there, what their mission is, how they are supporting themselves, how our presence will impact them, and how we can best blend into the existing infrastructure.

Establishing contact prior to arrival is very important. Advance parties need to look at not only where and how they want to set up, but also how to establish contact with all other agencies and organizations there immediately. They need to set up a council to ensure they do not cause fratricide in contracting for supplies or services, driving the price up and diverting all the resources to the Army because it can afford to pay more.

How important are allied partnerships in executing the national defense strategy?

They are essential. They help show others in the world that we are not alone in our beliefs. By establishing partnerships, we better understand any concerns our allies have, so we can shape a more thoughtful and cohesive strategy. Building operational and institutional capability and capacity in our allied partners is also in our own best interest; the more their capabilities are interoperable with ours, the better we will operate together.

For example, in Afghanistan, we leveraged the existing British contract for equipment demilitarization rather than set up a new contract at the same location. This prevented competition for the same capability and any price escalation, and it eliminated the time, effort, and cost to set up another new contract.

Can you share some challenges you faced while serving as a leader in the joint force and how you overcame them?

I had the responsibility of helping lead the logistics enterprise, driving joint force readiness and providing the best logistics advice to the chairman of the Joint Chiefs of Staff. Because I had no directive authority nor any budget control over the services and supporting agencies, I had to provide the services with a compelling argument for what needed to be done to create a coalition of the willing.

We set out to see what was import-

ant to the services, combatant commands, supporting agencies such as the Defense Logistics Agency, Defense Security Cooperation Agency, the departments of State and Homeland Security and the Federal Emergency Management Agency.

We then distilled core common items, developed a working group to prioritize tasks, established lead organizations and teams, and created a road map to get to common goals. We were very successful in creating energy and a will to develop a solution and in aligning efforts and funding among very disparate organizations.

There was not a lot of trust between the Department of Defense and other government agencies. To rectify this, we took on five projects that meant something to each organization and committed to solving these issues in six months. This was very successful. We developed and implemented solutions. This built a lot of trust and helped break down barriers at the worker level.

Having established contacts and trust enabled the military and other government agencies to reach out to each other and work a myriad of issues in response to the earthquake in Haiti. From that success, we collectively determined that we needed a means to work together throughout the year on other existing issues or potential problems and developed a government council that still operates today.

What can the Army do better in partnering with its sister services to increase readiness?

There are several things that can be done that will improve interoperability and reduce costs. There is not a natural inclination to work with another service to jointly design equipment and supplies. This is often due to different requirements and timing of when the equipment is needed. But the services should seek opportunities to develop standardized pieces of equipment and supplies.

This could be done in many ways. First, each service should recognize the requirements of the other services, as far as function and scale. The requirements are very different if you are setting up an Air Force expeditionary base versus a Marine Corps patrol base. However, as bases grow and you have three services on them with equipment that does not work together, this makes the services less effective and efficient.

Would it make more sense to have equipment that is interoperable, modular, operable from different power sources (power grid, generator, solar), and scalable from very small to very large? Absolutely, it would. The services should start with standardizing core items, like generators, tents, base camp shower systems, tool kits, and maintenance sets.

Second, we should align systems so they can talk to each other and streamline processes. The Army and Marine Corps have made some workarounds to allow the Marines to order parts through Army supply systems on Army-operated bases.

The cost and complexity of developing one system is not practical. The first step is to look at standardizing terminology so the same language is spoken. The systems then have the same context for word choices in data fields. I think establishing design characteristics for systems that make them interoperable should be mandated across the services for all new systems developed. The Office of the Secretary of Defense has made some headway in this, but more work needs to be done.

Third, expanding the understanding of each services' systems and processes can be done through officer, warrant officer, and noncommissioned officer professional development programs. Simply having Soldiers read professional publications about their specialty from other services or participate in interservice blogs, exchange programs, and the like can be invaluable. The services also need to do the same kinds of things with their commercial industry partners and allies.

How does innovation and technology affect joint force success, and how does it increase interoperability in the future?

Soldiers are master innovators. The more senior leaders trust junior leaders and subordinates to contribute to solutions, the more the Army is able to take advantage of the incredibly talented force we have.

There are many junior Soldiers who not only understand the new technologies better than older Soldiers but also can imagine better and more creative uses for those technologies. For example, several junior officers developed an in-house program to determine the most cost-effective place to refuel aircraft given the actual cost of the fuel at the destination airbase in Afghanistan or at the home base in Kuwait or Qatar.

Not everything that works for commercial industry will work for an expeditionary military. But a lot of industry's innovations can work with a little adaptation. The Army needs to be on the lookout for those kinds of things.

Information technology has been huge in enabling a global distribution network. However, we still have to reduce errors and ensure sufficient redundancy.

Today the Department of Defense's in-transit visibility system is dependent on fixed infrastructure. Satellite tracking for items exists, but it is very expensive. We need to look at how to drive down the costs for tracking equipment and supplies in transit without providing specifics to unauthorized users that could cause pilferage.

Intelligence, surveillance, and reconnaissance in combination with unmanned vehicles can free Soldiers from going on convoys to very dangerous and remote locations. Intelligence, surveillance, and reconnaissance can help determine route security and obstacles. 3-D printing can help maintainers make emergency repairs forward. But, we need to be wary of pushing capabilities too

far forward and burdening forces with unresourced missions that can be better performed at major base camps.

We very effectively used capabilities of other services to support missions in Iraq and Afghanistan. The Navy Phalanx CIWS [close-in weapon system] is for defense against anti-ship missiles, and the Army used it in base camp security. In addition, Naval electronic warfare officers were assigned to Army units and helped with frequency deconfliction on Army vehicles to mitigate issues with electronic equipment canceling out existing system capabilities.

What issues do you foresee for the joint force as we shift to more expeditionary operations?

All of the services are working very hard to increase readiness, particularly in expeditionary operations. Operating in Iraq and Afghanistan caused the knowledge of how to deploy in an expeditionary manner to diminish.

The Army and Marine Corps have both said that they have already seen where the expertise they once had at every level is gone—except at the most senior levels. This means mid-level and junior officers and noncommissioned officers do not possess the knowledge or experience to teach their subordinates. Simple tasks like load planning equipment, loading out equipment on rail cars, and air load planning are difficult.

We can remedy this by reviewing, updating, and if appropriate, changing standard operating procedures we worked so hard to develop during the Cold War and after Desert Storm. This might include reviewing old standard operating procedures units had when deploying to Germany or to the National Training Center, which were proven methods that only need updating.

We also need to do more joint training to ensure we are interoperable and examine what needs to change in doctrine or policies to facilitate how we want to operate. Emergency deployment readiness exercises by air, sea, and a combination of the two used to be a staple of unit training. In the 24th Infantry Division, we built readiness for deployment by crawling, walking, and running through professional development discussions, rehearsal-of-concept drills, tactical exercises without troops, command post exercises, and full-scale rehearsals.

Finally, we need to relook at base camps—not so much the standards at base camps, but the pace at which we achieve them. We became enamored with having all of the creature comforts of home at them, and this put an extraordinary demand on logistics support. Soldiers need to know that we will take care of them. However, they are savvy enough to know that mission requirements and security come before burgers and ping-pong tournaments.

Is maintenance also an issue?

Absolutely. Maintaining equipment in remote locations is a significant challenge for all services. This is not new. We had pre-positioned materiel configured in unit sets throughout the Cold War, and Army pre-positioned stocks both ashore and afloat greatly expanded after Desert Storm. Again, we know how to do this at the senior levels but not the junior levels.

We need to ensure we have trained operators and mechanics. Much of the maintenance work was performed by contractors overseas to reduce the military footprint. We should train Soldiers to handle maintenance tasks by making routine and scheduled maintenance part of unit training schedules and by ensuring junior unit leaders are properly trained to supervise it. Maintenance is training!

We also need to do more with advanced parts forecasting tools. The stress on a weapon system is different in peacetime than in war and different in various geographic locations. We order parts on the basis of current demands and keep some wartime stocks on the basis of past history and hard-to-source items. But in a contingency, the parts we have stocked may not be the right ones. Using big data analyses, like industry uses to develop more advanced forecasting models, could address these variables and allow us to expand options and reduce costs.

What piece of advice would you give to Soldiers to maximize their success in joint billets?

Learn as much as you can about the joint organization you are in. Learn the other services' cultures, processes, and procedures, and make sure you understand each service's role in accomplishing the mission. You aren't trying to convince them to transfer services. Rather, you are trying to help everyone involved understand how others operate. Doing so will provide insights into how to improve your methods.

The same thing goes for relationships with commercial industry partners and partners from other nations. As others teach you about their services—how they operate, who makes decisions, and what is important to them—make sure you reciprocate and teach them about the Army.

Become as much of an expert as you can on the Army so that you can offer input on why we do things the way we do. When you return to your parent service, become an advocate for the joint organization you just left and impart what you learned to others.

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Staff Sgt. Joshua T. Lemire, an allied trades specialist with the Communications Support Detachment, Joint Communications Support Element, welds a metal fabrication. In the allied trades shop, sustainers can fabricate components for testing new communications processes and make repairs through machining and welding.

Sustaining the Joint Communications Support Element

Army sustainers adapt to joint policies, learn Air Force processes, and integrate Navy Seabee expertise to provide rapidly deployable communications capabilities to early-entry forces.

■ By Chief Warrant Officer 5 Alexander W. Taylor

The Joint Communications Support Element (JCSE) is a short fuse, rapidly deployable airborne communications support provider based at MacDill Air Force Base in Tampa, Florida. The unit is assigned to the Joint Enabling Capability Command of the U.S. Transportation Command.

The JCSE provides en route, early-entry, and scalable command, control, communications, computer, combat systems, intelligence, surveillance, and reconnaissance (C5ISR) service capability to combatant commands and other agencies. It facilitates the rapid establishment of a joint force headquarters and bridges joint C5ISR requirements.

Organization

The JCSE comprises three active, multiservice joint communications squadrons, two Air Force National Guard communications squadrons, and one Army Reserve communications squadron.

The headquarters squadron consists of staff sections from J-1 (personnel) through J-9 (civil-military operations) and the command team. The command team consists of an Army colonel and command sergeant

major, Air Force lieutenant colonel, and civil service GS-14 who serves as the chief of staff. The active component squadrons are supported by the Communications Support Detachment (CSD) also based at MacDill Air Force Base.

Training

The Joint Communications Academy (JCA) prepares newly assigned members for the missions they will perform as part of a joint communications squadron. The 13-week training program provides a combination of tactical and technical training to prepare unit members for deployment. The JCA is in addition to advanced individual training and other technical professional military education.

The technical portion of the JCA includes baseline training on radios, computer networking, managing work groups, satellite communications, and managing calls. It includes a one-week course on the Joint Building Blocks System and the joint force headquarters communications package.

The Joint Building Blocks System is a modular, internet protocol-based package capable of providing secure and nonsecure voice, data, and video services. The system can be customized to support a range of operations, from initial-entry to the establishment of a joint task force.

The joint force headquarters communications package provides a full suite of mission command-enabling infrastructure, including tents, power, and environmental control units.

The CSD

The CSD provides sustainment support to the JCSE for vehicle management, power generation, heating, ventilation, air conditioning, engineering, maritime operations, parachute packing, and communications equipment movement and distribution.

Support is provided as far forward as the JCSE is located through direct interaction with theater-designated supply and distribution agencies.

All of the JCSE's sustainers are assigned to the CSD. The CSD comprises 51 personnel and is a mix of Army, Air Force, Navy, and civilian employees. It is commanded by an Army chief warrant officer five senior ordnance logistician. An Air Force vehicle maintenance senior master sergeant is assigned as the senior enlisted adviser.

Air Force and Army personnel comprise the majority of the CSD staff. The Air Force provides sustainment support with power generation providers and vehicle maintenance and management. The Army provides sustainment through allied trades personnel, engineer equipment repairmen, vehicle mechanics, heating, ventilation, and air conditioning repairmen, aerial delivery specialists, and parachute packers. The Navy provides Seabee personnel.

Sustainment Training

Because of its unique mission, the CSD has many cross-training and technical training opportunities that typically are not available to Soldiers and Airmen, including training presented by original equipment manufacturers such as Evinrude, Oshkosh, Caterpillar, and Eaton Transmissions. This training provides CSD sustainers with the knowledge needed to perform maintenance at a higher than typical level.

Training is also offered to support the CSD's maritime mission. This training is needed so that CSD sustainers can support airborne operations in which paratroopers may land in water or where a water jump is planned for the JCSE. Regardless of branch, service members assigned to the CSD attend the Evinrude Maritime Repair Course to become certified.

The CSD allied trades shop is comparable to those in the Army's combat brigades. In the allied trades shops, sustainers can fabricate components for testing new communications processes and make repairs through machining and welding.

Below is a list of additional technical courses that service members assigned to the CSD have the opportunity to attend:

- ☐ Zodiac Inflatable Boat Repair Course.
- ☐ Evinrude Outboard Maintenance Course.
- ☐ Oshkosh Family of Medium Tactical Vehicles Maintenance Course.
- ☐ Caterpillar Advanced Engine Course.
- ☐ Steering, Suspension, Wheel Alignment, and Braking Systems Course.
- ☐ Vehicle Air Conditioning Systems Course.
- ☐ Automatic Transmissions Course.
- ☐ Diesel Engine Maintenance Course.
- ☐ Vehicle Diagnostic, Test Equipment, and Electrical Systems.
- ☐ Civil Engineer Advanced Electrical Troubleshooting.
- ☐ Troubleshooting Electrical Power Generating Equipment.

The service members assigned to the CSD provide support through their military occupational specialties and can operate with minimal guidance. Each service member who deploys must know his or her job and the communications package that is being deployed.

Anywhere in the world that there is a communications support team from the JCSE, there is a CSD sustainer providing it with unparalleled support.

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To learn more about an assignment with the JCSE and the CSD, visit http://www.jcse.mil.

Soldiers from the 742nd Support Maintenance Company attend a deployment ceremony on Feb. 26, 2017. The South Carolina Army National Guard unit will maintain and repair vehicles, electronics, and small-arms weapons in support of Operation Atlantic Resolve while assigned to the 16th Sustainment Brigade. (Photo by Sgt. Tashera Pravato)

The Effect MTOE Has on Mission Command in Support Companies

Adding two Soldiers to the headquarters section of a sustainment company could improve the unit's ability to conduct mission command.

■ By Capt. David A. Ferreira

When I was a combat engineer in command of a maintenance company in an armored brigade combat team brigade support battalion, I saw some strange things. My company's modified table of organization and equipment (MTOE) is what bothered me the most.

My formative years as an officer were spent as a platoon leader and executive officer of an engineer company in an echelon-above-brigade engineer battalion. That company's headquarters' MTOE included 19 Soldiers, 11 of whom were medical, communications, supply, and chemical, biological, radiological, and nuclear personnel. The remaining eight Soldiers were dedicated to executing mission command for the subordinate platoons.

The maintenance company headquarters, however, consists of only three Soldiers (the command team) other than the supply section. This leaves one of the most complex companies in the brigade combat team with a commander, a first sergeant, and an executive officer to execute mission command over the entire company.

During my first three months in command of the maintenance company, it was difficult to figure out why it was hard to complete routine tasks and to communicate across the company in a fast and efficient manner. After discussing the MTOE

with the brigade support battalion commander, the issue became very clear. Based on its structure, the maintenance company is not designed to execute mission command.

Hierarchical Versus Linear Units

Line companies have a clear and coherent hierarchy that makes communication and mission command flow downward smoothly. The command team and headquarters mission command structure is replicated in the platoons. A platoon leader and platoon sergeant lead subordinate squads and teams within each platoon.

This hierarchy is built to absorb change and allow leaders to adapt to new tasks as missions occur. When commanders task line units, the impact on the subordinate units is minimal because of their redundant structures.

This redundancy does not exist within a maintenance company. The company is linear rather than hierarchical. Once information gets to the company command team, there are numerous directions that it must go. The team must receive, interpret, and analyze information in a way that allows subordinate units to act on it as soon as it is disseminated.

As tasks come in, they affect the linear formation more than they would affect a hierarchical one because the subordinate formations are not designed to execute the operations process. Rather than having a handful of robust platoons, the maintenance company has many very small sections. As a section loses an individual or is given another mission, the company quickly loses capability.

The Effect on Mission Command

In order to execute mission command, a command team must be able to turn raw data into information that can be acted on. Staffs receive data of all shapes and sizes at varying speeds. They must analyze the data in a timely manner and turn it into a product that the commander can use to visualize the operational environment. (See figure 1 on page 54.)

Staffs use tools such as the Army design methodology and the military decisionmaking process to turn data into an achievable plan. These processes contribute to the commander's ability to make timely and informed decisions.

The ability to exercise mission command is directly tied to organizational structure. A brigade staff is designed to help a commander understand and visualize a problem set or mission so that he can direct a course of action. The battalion staff mimics the same capability on a smaller scale for the battalion command team.

> A coherent structure with the right personnel absolutely enables the operations process and functional mission command.

However, sustainment units are not set up to successfully execute mission command. For example, the brigade support battalion is the only battalion in the brigade that has a captain as a battalion S-3, and it has a very limited operations staff.

Three key points demonstrate why organizational structure is important to mission command and how making sustainment organizations hierarchical could increase the agility of sustainment companies in executing mission command. First, sustainment companies are oversaturated with mission command systems. Second, the operations process is inhibited by the Army's linear sustainment structures. And third, the linear flow of information affects communication and, in turn, execution.

Oversaturation of Systems

With the move to decisive action, the company echelon has lost the ability to operate digital systems outside of the Joint Capabilities Release and Blue Force Tracking in a theater of operations. This lack of data connectivity means that companies must use analog methods and practice functional mission command on the move with FM radios and digital communications inherent to their organizations.

What the decisive action model does not capture is the multitude of digital requirements on companies in a garrison environment. Systems are placed at the company level without regard for supporting structures and personnel. When operating at home station, companies must operate nearly every digital system that battalions operate.

To build subject matter experts for digital mission command systems at every echelon, the digital master gunner concept is being pushed to the company level. This concept is a great asset, but in companies with a headquarters limited to the command team, Soldiers must be pulled out of a shop or section in order to be trained and used.

Those outside of the company often argue that running digital mission command systems is an "additional duty."

This is absolutely inaccurate. To operate systems such as the Command Post of the Future, Digital Training Management System, Medical Protection System, and eProfile, the company needs a capability built into its headquarters to manage them effectively.

At the company level, populating and managing these systems is a full-time job. If the mission command architecture is changing for the future, then the company struc-

ture must also change in order for it to be successful.

The Operations Process

Commanders at all levels drive the operations process. Each command above the company level has a staff to assist the commander in executing this process and facilitating operations. Naturally, a company does not need a staff, but it still must complete the operations process in order to facilitate successful operations.

Line units have measures in place to complete the operations process. A line company headquarters facilitates this with a sergeant first class as an operations noncommissioned officer-in-charge. This Soldier is typically a high-performing platoon sergeant that is being groomed to become a first sergeant. Line companies also possess clear and coherent platoon structures, led by a platoon leader and a platoon sergeant, supporting the operations process.

A coherent structure with the right personnel absolutely enables the operations process and functional mission command. In most sustainment units, the commander is the only one executing the operations process at the company level. If the commander is executing the process rather than driving it, he will be unable to visualize the relationship between current and future operations, and in turn, the company will not have clear direction.

Information and Execution

By receiving, processing, and analyzing information, commanders create time and space in which subordinates can take action. Space is the physical area subordinates operate in based on the time allotted by the commander. The more time subordinates have, the more creative and comprehensive their plans can be. This directly improves the quality of their actions.

Little time with little space creates poor action. A balance of time and space, created by effectively turning data into knowledge for subordinate units, creates actions that are more functional and effective.

Most commanders have staffs that process data into knowledge. In most sustainment formations, a company's ability to do this effectively is voided. Instead, the assumption is made that by the time the company receives information, it is ready to be used for mission execution. More often than not, this is not the case.

Typically, data flows in quantities so large and so fast that it comes crashing down at the company level with little refinement. Companies receive data rather than knowledge, without time and with very limited space. Then they are expected to act on it with a limited personnel structure.

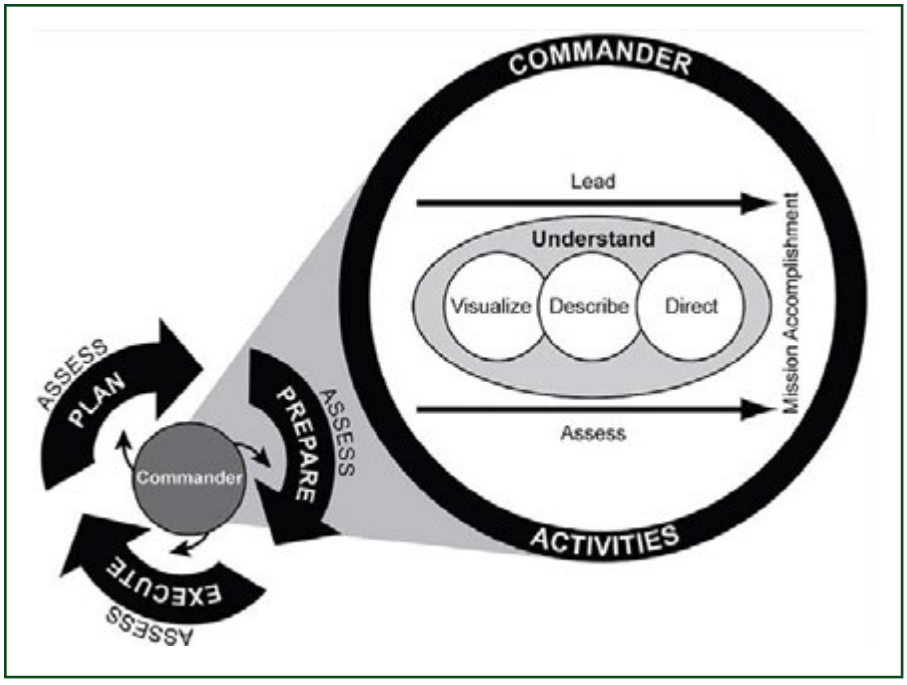

Figure 1. The operations process as depicted in Army Doctrine Reference Publication 5-0, The Operations Process.

I have a unique perspective after commanding a company that executed missions on par with a battalion and another that had to create a mission command capability out of what was available in its mechanic population. Although the latter unit executed missions well, a simple change in the unit's structure would yield a high payoff.

Having an operations sergeant and one administrative noncommissioned officer at the company level would greatly enhance a sustainment company's capabilities. Commands up to the brigade level would benefit from their companies having a greater capacity to execute mission command and process information and requirements.

The Army is moving to a place where companies are more agile and have a greater need to process data into actionable knowledge. Some MTOEs support this, and some clearly have not caught up. Adding a few personnel to a sustainment company headquarters not only will improve the function of the company but also will improve the entire sustainment force.

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Army Reserve Soldiers from the 236th Inland Cargo Transportation Company use a Kalmar container handler to download shipping containers of ammunition at a railhead at the Drawsko Pomorskie Training Area in Poland, on June 2, 2016, in support of Anakonda 2016.

Exercise Anakonda 2016: Globally Integrated Logistics in Action

USAREUR successfully supported a complex multinational exercise with limited resources by working with partner nations to set conditions.

■ By Capt. Harry Cambrelen Jr.

Anakonda, an annual Polish-led multinational exercise, provides essential lessons that commanders, planners, and sustainers can apply to future operations. U.S. Army Europe's (USAREUR's) recent participation in Anakonda 2016 (AN16) highlights challenges that sustainers should expect in future operations.

The Joint Concept for Logistics asserts that the primary challenge that logisticians will face in the future is supporting an increasing demand for global integrated logistics in an era of constrained and degraded resources. The complexity of providing unconstrained logistics support to AN16 throughout the USAREUR area of responsibility (AOR) is an example of this challenge.

The 21st TSC

The 21st Theater Sustainment Command (TSC) is the senior Army logistics command in the USAREUR AOR. During AN16, the 21st TSC supported the reception, staging, onward movement (RSO), and distribution of cargo in theater and enabled the integration functions of U.S. units. The TSC also received movement requests from the 39th Transportation Battalion (Movement Control) and oversaw the movement request approv-

Army Reserve Soldiers from the 364th Expeditionary Sustainment Command set up their tactical operations center near Warsaw, Poland, on May 13, 2016, in preparation for Anakonda 2016. The exercise involves more than 25,000 participants from 24 nations. (Photo by Maj. Marvin Baker)

al process for road use and border crossings.

One of the 21 TSC's missions in Europe is to review and process march credits for using German roads, permits to deploy for using Polish roads, and diplomatic clearances for crossing the Germany-Poland border. All of these types of movement requests are required to traverse partner nations' roads. For an average exercise, the TSC processes movement requests for approximately 25 convoys.

However, during AN16, the 21st TSC processed movement requests for more than 189 convoys to and from Germany and Poland. This was over 656 percent more movement requests than normal, which made it difficult for the TSC to maintain control and visibility of ground movements.

Movement Control

Currently no standardized system exists to provide control and visibility of ground movements that incorporate the European theater's various movement approval processes. USAREUR organizations and multinational partners track and process data using antiquated and paper-based systems.

The validation and approval processes for movement requests, rest overnight sites, refuel on the move sites, funds verification and use authorizations, and escorts are all tracked by different spreadsheets, by different organizations, and on different timelines. This information is transmitted by email or, in some cases, by fax machine. These methods cause delays and confusion, restrict holistic visibility, reduce control, and put an unnecessary burden on units.

The Polish and German national movement control centers (NMCCs) coordinate and optimize vehicle movements conducted on their countries' roads. They are the approval authority for land movement of foreign forces within their respective borders.

One of their roles is managing commercial and multinational vehicle movements in order to ensure the movements do not exceed the limits of road infrastructures. The Polish NMCC also coordinates with local law enforcement to provide security escorts for vehicles carrying sensi-

tive items, hazardous materials, and oversized vehicles.

Units' unfamiliarity with the submission requirements for movements in Poland caused half of the movement requests to contain errors. If a movement request contained any errors, the movement control team (MCT) sent it back to the unit for corrections. Because of the lack of a tracking system and visibility, version control became an issue as MCTs received resubmitted movement requests. As a result, the requests bottlenecked at the local MCTs.

The MCTs sent large quantities of movement requests to the 21st TSC, which then sent the requests to the NMCCs. Receiving large numbers of movement requests in such a short period of time overloaded the host nations' systems and caused movement delays.

In the European AOR, the movement request process involves approval from multiple entities. Units should receive clear guidance on the standards and procedures for submitting movement requests and build in enough time to correct errors during the movement planning process. This allows everyone involved in the approval process to review movement requests with enough lead time to make required adjustments.

An automated system should be established to provide control and visibility of ground movements. It should incorporate the various movement approval processes and synchronize all entities involved.

Coordination

U.S. forces had to establish multilateral agreements and operate within restricted timelines, routes, and the limitations of partner nations. USAREUR had to form relationships with its partner NMCCs to shape the conditions of road use. The use of partner nations' roads extended logistics capabilities but also widened the range of possible threats.

The 21st TSC analyzed scheduled convoys and routes and presented the information to the German NMCC. The German NMCC raised concerns about the feasibility of moving such large amounts of convoys into Poland in such a short period of time.

During the time of the operation, a large amount of civilian traffic was on the road for the vacation season. German armed forces were also conducting a military training exercise using the German road network. The NMCC asserted that adding U.S. convoys would greatly exceed the capacity of the road network. After further coordination, the NMCC approved the movements but restricted the movement windows.

The 21st TSC worked around the restricted timeline by rescheduling convoys and establishing alternate routes for entry into Poland. Convoys could move only between 1800 and 0600 hours, and oversized convoys were restricted to moving between 2200 and 0600 hours.

Another challenge that added to the complexity of AN16 was the limited training time available for Army National Guard and Reserve units. The 364th Expeditionary Sustainment Command entered Poland one week after the deployment phase of the operation and returned to home station during the redeployment phase. The command was not given enough time to complete the required training and execution of all phases of the operations, including RSO and reverse RSO.

Becoming familiar with each country's standards should be included as a part of the movement planning process. This enables synchronization between units, interagency partners, and all countries involved.

Contracted Support

USAREUR and its multinational partners had to support AN16 with limited personnel and staff. USAREUR and its subordinate units re-

U.S. and Polish Soldiers prepare for the departure of a vehicle convoy conducted by the 361st Engineer Company. The convoy was leaving the port in Szczecin, Poland, to take part in Anakonda 2016.

lied on external support because of the increased operating tempo and the limited number of sustainment units within the AOR. Contracted line-haul, rail assets, and host-nation law enforcement escorts enabled the successful rapid deployment of forces.

A civilian German railway cargo carrier is the primary mover of U.S. Army cargo transported by rail. AN16 increased the demand for European railcars, and the carrier struggled to support the mission. The primary problem was a shortage of specialized cars that were required to transport oversized vehicles, such as tanks and M88 Hercules recovery vehicles.

The U.S. European Command (EUCOM) Intratheater Commercial Transportation Branch's (ICTB's) primary role during AN16 was to negotiate and establish tenders of service with commercial trucking and bus companies to support the movement of cargo and personnel participating in the exercise. Supporting AN16 was challenging for this nine-person staff because it was also still supporting the entire EUCOM theater. Last-minute requirements and shifting movement priorities strained commercial asset procurement efforts.

USAREUR and subordinate units have a limited number of trailers that are certified according to the European Agreement Concerning the International Carriage of Dangerous Goods by Road. As a result, USAREUR had to request support from the ICTB.

Polish escorts are required to accompany foreign nations' vehicle movements through their assigned routes if they are oversized or contain sensitive items. Under normal circumstances, the escorts would be able to provide this service, but the number of convoys exceeded the capacity of law enforcement personnel available.

AN16 exemplified the challenges associated with increased demand on logistics, limited resources, and increased operating tempo. USAREUR and its multinational partners were still able to meet mission requirements because of the relationships formed and the intensive planning involved. All joint, interagency, intergovernmental, and multinational partners should be included early in the planning process before any major operation or exercise.

Redeployment

At the conclusion of the exercise, the 21st TSC provided sustainment mission command of all redeployment operations and assumed tactical control of all redeployment movements. Using a lesson learned from the deployment phase of the operation, the 21st TSC developed a theater transportation plan.

The plan included centralized planning and decentralized execution to identify intratheater vehicles and a movement schedule for redeployment. After receiving notification of their movement windows, units submitted their movement requests through the proper channels to the 21st TSC.

The redeployment process was more successful than the deployment because units were familiar with the movement request submission process. The 21st TSC held a daily redeployment synchronization meeting to create a shared understanding among EUCOM, the USAREUR staff, the 21st TSC, and supported units. The meeting was a forum to correct freedom of movement issues and prevent problems from occurring.

Lessons Learned

Large-scale exercises involving joint, interagency, intergovernmental, and multinational partners require the participation of all entities involved during all phases of planning. USAREUR and subordinate units could have mitigated some of the visibility issues and delays experienced during the movement request process if the NMCCs were included in earlier phases of planning.

USAREUR could have also established a standardized system that is easily accessed and interpreted by all parties involved. USAREUR, in coordination with EUCOM, allies, and multinational partners, should establish a common tool that comprises commonly available software that NATO partners and allies can use for requests, approvals, management, integration, and execution of convoys and commercial assets.

Operation and exercise planning should reflect the units' timelines and availability. The amount of time that the National Guard and Reserve units participated did not allow for required training and execution of all phases of the operation. Units with a limited amount of training time should deploy to execute in phases and plan repeating large-scale operations and exercises to focus on different phases every year.

Higher headquarters should empower subordinate leaders by providing clear decision-making authority. This will allow commanders on the ground to make decisions in accordance with host-nation escort requirements. Leaders down to the convoy commander level should be encouraged to make decisions based on the guidance given from their headquarters.

U.S. forces must work within the constraints and limitations of joint, interagency, intergovernmental, and multinational partners. They must abide by conditions set by allies and remember that roads owned by the allies are a shared resource. Partner nations' military traffic and commercial and civilian vehicle traffic should be thoroughly analyzed and explored in depth to identify and mitigate potential conflicts.

It is important to establish and maintain relationships with host-nation entities prior to movements to allow for integrated planning and risk mitigation. This allowed USAREUR to streamline the approval process for movement requests.

AN16 provided important takeaways for commanders, planners,

Lt. Gen. Ben Hodges, commander of U.S. Army Europe, speaks during a briefing with allied military and civilian personnel prior to a demonstration of allied military capabilities during Anakonda 2016 in the Drawsko Pomorskie Training Area near Oleszno, Poland, on June 16, 2016. (Photo by Sgt. Ashley Marble)

and sustainers at all levels in the areas of mission command, information management, setting the theater, and training.

Mission command. Understanding the authority and the mission requirements of the assigned and attached forces that require support is key to a logistician's success. Task organization, battlespace ownership, and reporting requirements are required knowledge to set the conditions for the mission. Without adequate and clearly defined mission command, movements can go unreported or potentially face delays.

Information management. The ability to prioritize, organize, and distribute movement data enables the synchronization of multimodal movement timelines and provides transparency among key organizations. Information availability allows units to solve issues and prevent delays. USAREUR developed a mobility operations board to facilitate discussion on current and future movements.

Setting the theater. Getting the right things to the right place at the right time requires advance planning and coordination. A deployment or redeployment plan ideally has its own distinct operation order or fragmentary order. This allows the supporting units to understand the requirements, roles, responsibilities, and conditions to meet the end state.

Train as you fight. Logisticians should treat the deployment and redeployment movements of all exercises as tactical operations. Sustainers operate under the same tasks, conditions, and standards for exercises as they do for operations. If sustainers fail at their missions, supported units will go without food, ammunition, and critical assets. The same level of detail required for coordinating resources, planning, and accepting risk should be applied whether it is a training event or a real mission.

USAREUR and multinational partners supported the logistics-intensive AN16 exercise while operating with limited assets and degraded logistics capabilities. USAREUR's ability to integrate multinational partners and interorganizational capabilities to establish freedom of movement and speed of assembly was critical to achieving interoperability and building readiness.

Capt. Harry Cambrelen Jr. is the current operations officer in the USAREUR G-4 Mobility Operations Division. He is a graduate of Georgia Southern University and the Combined Logistics Captains Career Course.

Applying Lean Six Sigma at the Forward Support Company Level

Lean Six Sigma methods can be applied at any level of an organization where there is significant leadership support, dedicated team activities, and a focus on process improvement.

■ By Capt. Luke P. High

The Army has successfully implemented Lean Six Sigma (LSS) at the strategic level and in top-tier operational units, but not at the tactical level. The purpose of this article is to provide recommendations, based on my experience as a forward support company (FSC) commander, for how units at the tactical level can improve their processes by implementing LSS.

Sustainment organizations at the brigade combat team (BCT) level and below should implement continued process improvement to identify deficiencies and create efficiencies. The recommendations that follow are geared toward FSCs within light infantry BCTs.

Identify and Train Team Members

The first step in implementing LSS is to identify which members of the unit will be part of the LSS team. These Soldiers must be trained through the Army's LSS training program. A trained and experienced team is critical to successful LSS implementation. The initial training investment will pay dividends in realized savings from successful projects.

Team members must contact an Army LSS deployment director located within their major command. The LSS deployment director maintains training seat quotas and assigns mentors who help students complete the projects required to receive LSS certifications and additional skill identifiers.

Class seats are assigned through the Army Training Requirements and Resources System (ATRRS). Deployment directors can register candidates for Army LSS training in ATRRS using school code 142.

In an FSC, the LSS team should be composed of six individuals of various military occupational specialties and ranks. These team members should report directly to the FSC commander.

The company executive officer, a first lieutenant who oversees the FSC's maintenance operations, should lead the team. Ideally, the first lieutenant will have been in the position for one year and have at least three years of total experience in sustainment operations.

The chief warrant officer two in charge of executing the battalion's maintenance operations and planning should also be on the team. This warrant officer will bring at least eight years of experience to the team.

The maintenance control sergeant first class should serve as the senior adviser to the warrant officer and will have at least 10 years of experience. The team should include the senior mechanic or a shop foreman, a staff sergeant with at least six years of experience.

The fifth member should be the transportation section leader from the distribution platoon. This individual, who is in charge of the brigade support battalion's largest fleet of rolling stock, will bring at least six years of experience and vehicle operations knowledge.

The last member of the team should be a general mechanic in the rank of specialist or private first class. This Soldier will be the daily "wrench turner" and will need to be able to process critical information and provide it to senior team members.

Implementing LSS

Once the team members are selected and trained, they should plan the implementation of their LSS project using the define, measure, analyze, improve, and control approach illustrated in Michael George's *Lean Six Sigma Pocket Tool Book*. All steps of the model are equally important to the success of the LSS project.

One of the most significant issues that I faced as an FSC commander was the unavailability of vehicle repair parts, which increased customer wait times and decreased unit readiness. I will use the problem of repair part unavailability as an example for how to apply the LSS phases.

Define. The first step is to identify the problems from the customer's point of view. The team should conduct interviews and surveys and hold discussions with customers to understand their concerns. Internal processes should be reviewed and staff concerns aired. In the end, the top reasons for a lack of available parts should be identified and thoroughly defined.

Measure. The standard measurement for the output and turnover rate of vehicle repair is guided by the Army Maintenance Allocation Chart in Army Training Publication 4-33, Maintenance Operations. It is the Army standard for conducting maintenance operations.

Current operations, in my experience, fall below the published standards and need to be accurately measured against the standards to achieve a maintenance baseline. When trying to resolve parts shortage issues, the team should start the clock when a maintenance work order has been placed and stop the time once the vehicle is repaired, the work order is closed out, and the vehicle is picked up by its operator.

Analyze. During the analyze step, the team examines the issues directly related to the problem of parts availability. The team should analyze shop and bench stock inventory levels, vehicle and equipment utilization rates, and any excess property that may be authorized.

If the shortage of parts is truly the unit's fault, the team may discover that orders were not filled because of budget constraints, were canceled by a higher headquarters, or were never placed because of other repair priorities.

Improve. The improve step requires three activities: brainstorming to create solutions, testing the solutions, and assessing the outcomes of the solutions.

Using the FSC maintenance example, two possible solutions could be proposed. First, a policy could require all units to maintain their shop and bench stocks at 100 percent. Most organizations typically have less than 50 percent of their stocks on hand. However, the Army mandates that fleets be kept fully mission capable and to the –10/–20 maintenance standard for readiness reporting.

In order to mitigate this problem, units could place underused vehicles and equipment in the Army's Low Usage Equipment Program so that they are not required to be maintained at such a high standard. This could free parts for the maintenance of regularly used vehicles.

Second, the FSC could turn in excess vehicles and equipment to the Defense Reutilization and Marketing Office. Most units have vehicles and equipment on their property books that are not authorized by their modified tables of organization and equipment. Turning in equipment would remove it from the unit property book and eliminate its tracking and maintenance requirements. This would also free funds for regularly used vehicles.

Two maintainers from Forward Support Company H, 2nd Battalion, 5th Cavalry Regiment, 1st Armored Brigade Combat Team, work to recover a light medium tactical vehicle on May 25, 2016. (Photo by Capt. Joseph Best)

Before implementing a full-scale improvement, the team should conduct a test run on a sample group, for example, one FSC in the BCT. If the team and the BCT commander are satisfied with the outcomes, the improvement could then be implemented across all FSCs within the BCT.

Control. In the control step, leaders and the LSS team monitor the implemented processes, observe benchmarks, and collect relevant qualitative and quantitative data to capitalize on and continue process improvement. This step ensures that processes are controlled and observed to identify and eliminate or mitigate any unplanned variables in the system. Successes, failures, and standard operating procedures should be shared with other organizations.

By improving maintenance processes, sustainers can properly maintain repair parts inventory levels and reduce customer wait times. This is just one example of the growing opportunity for LSS use at the tactical level in the Army.

Leaders should seek areas of process improvement by identifying deficiencies, implementing efficiencies, and continually assessing their processes as missions, situations, and environments change. Process-driven management will make the organization more effective and efficient while saving money. In the end, LSS will result in a better trained organization, a mission-ready fleet, and a lethal fighting force.

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Sgt. 1st Class Dustin Forgey from the Ordnance School tests Spc. Daniel Larios, 308th Brigade Support Battalion, on his knowledge of memos located in the tool room as part of the evaluation for the Chief of Staff Army Award for Maintenance Excellence competition, at Joint Base Lewis-McChord, Washington, on Feb. 24, 2017. (Photo by Sgt. Jacob Kohrs)

The Evolution of the Ordnance Corps Maintenance Mission

Ordnance Corps Soldiers have played a vital role in the history of the Army, and their mission has continued to evolve with advancements in technology.

■ By Capt. Shaisha M. Ferguson

The Ordnance Corps' primary mission is to support the sustainment of weapon systems, ammunition, and missiles, and the production of new equipment and ground mobility materiel. Over the past 100 years, technology developments in areas such as mechanization, missiles, nuclear weapons, ammunition, and logistics support have greatly affected the mission of the Ordnance Corps.

Branch Beginnings

The Ordnance Corps is a multifunctional branch whose roots lie in the country's colonial beginnings. The Ordnance Department was founded on May 14, 1812. However, the branch's history goes back to 1629 when Samuel L. Sharpe was appointed as the master gunner of ordnance in the Massachusetts Bay Colony.

Col. Decius Wadsworth became the Army's first chief of ordnance in 1812. Wadsworth's installation as chief of ordnance marked the beginning of the history of ordnance as an Army branch.

The Ordnance Department was originally a manufacturing organization that produced cannons and small arms. Early conflicts such as the Mexican and Civil Wars saw the Ordnance Department producing most of the weaponry used by the Federal Army. The Ordnance Department was responsible for the design and production of the Army's artillery and small arms, and the branch was devoted primarily to the acquisition of armaments. At the turn of the 20th century, however, new technologies introduced

new requirements for the Ordnance Department.

World War I

During World War I, the Army's expanded use of trucks placed a greater emphasis on maintenance. Ordnance units supported the American Expeditionary Forces in Europe and were typically located near the front lines. This was the beginning of the forward maintenance concept. The primary focus for the Ordnance Department was supply, maintenance, and ammunition. In support of the American Expeditionary Forces in France, 165 unit-level mechanics worked in mobile ordnance repair shops, heavy artillery mobile ordnance repair shops, and ordnance base shops.

The ordnance Soldiers' workload in France included fusing bombs and performing maintenance on 3,500 artillery pieces, 265 tanks, 1,740 artillery tractors, and more than 2 million small arms. They also repaired the French army's 75 millimeter guns, Renault tanks, recovery and ammunition trucks, and reconnaissance cars.

The lessons learned in World War I helped shape the Ordnance Department into a modern support branch with an increasingly important role in maintenance. This set the stage for its expanded role in World War II.

World War II

The focus on maintenance was even more important during World War II as the Army became more mechanized and increased its use of armored forces. As it did during the mobilization for World War I, the Ordnance Department grew significantly in terms of size and requirements.

During the war, ordnance branch missions included replacing fractured gun tubes on M3 tanks, assembling vehicles overseas, and managing ammunition supply points. The Ordnance Department supplied 47 billion rounds of small-arms ammunition, 11 million tons of artillery ammunition, 12 million rifles and carbines, and 3.5 million military vehicles.

This workload required a change in maintenance doctrine that resulted in an echelon-based organization. During World War II, the Army used five echelons of maintenance, with the highest echelon being the fifth. Also known as base shop maintenance, this level included rebuilding vehicles, weapons, and major assemblies.

The fourth echelon of maintenance was called heavy maintenance. It was located at the field Army level between the base level and the combat corps. The third echelon was called medium maintenance and included the units supporting the fighting divisions.

At the front lines, the first and second echelons were called organizational maintenance. These levels of maintenance were performed by the equipment operators and unit mechanics. The Army currently uses a two-level system: field maintenance and sustainment maintenance.

Preventive maintenance was one innovation that resulted from the five-level maintenance systems. Soldiers conducted daily checks and services, identified problems with vehicles, and created a tracking system for each vehicle. This system evolved into today's preventive maintenance checks and services program.

Training Today

The Ordnance Department was renamed the Ordnance Corps in the Army Organization Act of 1950. The Ordnance Corps underwent a major transformation under the 2005 Defense Base Realignment and Closure Commission, which consolidated all ordnance training under one school at Fort Lee, Virginia.

Today, the Ordnance School consists of six departments: Wheeled Maintenance, Track Metalworking and Recovery, Munitions and Explosive Ordnance Disposal, Armament and Electronics Maintenance, Ordnance Electronics Maintenance, and Tactical Support Equipment.

Soldiers now use advanced technology and computer systems to troubleshoot equipment during training, and the Ordnance School is constantly adapting training as new technology is introduced into the Army.

When the Army fields new vehicles, it creates the need for specialized mechanics to maintain them. For example, the fielding of the Abrams tank, Bradley fighting vehicle, and Stryker required a new generation of mechanics such as Bradley fighting vehicle system maintainers, track vehicle repairers, and Abrams system maintainers.

Support vehicles such as the heavy expanded-mobility tactical truck, palletized load system, and the family of medium tactical vehicles also require specialized maintainers. Up-to-date, comprehensive training programs are required to prepare ordnance Soldiers to support new systems.

Throughout history, a driving factor in the evolution of the missions and training of the Ordnance Corps has been the advancement of technology. New systems have been developed to take maintenance tracking and repair parts acquisition to the next level. New vehicles and weapon systems are continually being developed.

Ordnance Soldiers must be ready to meet the maintenance demands that these systems will place on them. When technology evolves, the Ordnance Corps will adapt to the challenges ahead. And Ordnance Soldiers will continue to play a vital role in the success of the Army.

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MACHINE GUN IN ACTION
CAMP LEE, VA.

Historical photos document early operations of Camp Lee, Virginia, during the beginning of World War I.

The Three Lives of Fort Lee, Virginia: World War I

In this first article of a series commemorating the 100th anniversary of Fort Lee, the author details the origins of the installation's long history of training troops.

■ By Dr. Kenneth Finlayson

2017 marks the 100th anniversary of Fort Lee, Virginia. Fort Lee was created during the U.S. mobilization for World War I, and its history can be divided into three distinct phases. It was first constructed to train an infantry division for combat in France, but the ensuing century witnessed major changes in the post's mission and focus.

Today, Fort Lee is the home of Army sustainment. Throughout its history, Fort Lee has played a significant role in Army training and continues to contribute to the Army of the future.

Fort Lee occupies nearly 6,000 acres in Prince George County, east of Petersburg. It is home to the Combined Arms Support Command as well as major Department of Defense organizations such as the Defense Contract Management Agency and the Defense Commissary Agency. Fort Lee supports a daily population in excess of 26,000 military and civilian personnel, including a student population of 16,000 Soldiers, Airmen, Marines, Sailors, civilians, and foreign partners. It is the third largest training center in the Army.

Entering World War I

World War I began in August 1914 with the German invasion of France. The war quickly evolved into a stalemate between the Central Powers of Germany and the Austro-Hungarian Empire and the forces of the Triple Entente of France, Russia, and the United Kingdom.

On the Western Front, 475 miles of trenches stretched from the North Sea to the Swiss border through Belgium and France. In the east, the enormous Russian army battled the Central Powers in western Russia and Galicia.

For 2 1/2 years, the United States maintained a position of neutrality. President Woodrow Wilson narrowly won his second term in office in 1916 running on the slogan, "He kept us out of war." This abstention ultimately proved unsustainable because of unrestrained German submarine attacks on U.S. commercial shipping and because of Great Britain's and France's unrelenting political pressure on the United States to join the war.

On April 2, 1917, Wilson asked Congress for a declaration of war on Germany, saying U.S. participation was necessary to "make the world safe for democracy." Congress declared war four days later, and the nation immediately began a massive mobilization effort to raise a million-man Army to fight overseas.

Training Camps

The United States was woefully unprepared for war; it had a regular army of only 108,000 men. To reach the target of a million Soldiers, the first mission of the War Department was to establish training camps for the influx of volunteers. Thirty-four camps were initially scheduled for construction.

The Army's approach to the mobilization was twofold. The existing 16 National Guard divisions would be trained at cantonments that were generally expansions of existing camps. To accommodate the flood of untrained volunteers, the War Department also created an additional 16 divisions organized into what was called the National Army. These divisions would be trained at newly constructed camps serving the geographic regions from which the volunteers were drawn.

The camp was laid out in a horseshoe shape roughly four miles long. Sixteen million linear feet of lumber was ordered to build the more than 3,000 buildings on the cantonment.

The principal difference between the camps was that the National Guard troops were billeted in tents while the cantonments for the National Army divisions featured wooden barracks. With the declaration of war, a flurry of construction began around the country.

Building Camp Lee

On April 24, 1917, the War Department notified the Petersburg Chamber of Commerce that a site in adjacent Prince George County had been selected for the construction of a National Army cantonment. The city leased 450 acres of farmland and forest to the War Department for the cantonment site and an additional 15,000 acres for a maneuver training area (land that included acreage on what is now the Petersburg National Battlefield).

The construction company of Rinehart and Dennis of Charlottesville, Virginia, was awarded the contract for building the camp with the firm of Saville and Claiborne of Richmond acting as the supervisory engineers. Maj. E.K. Coe of the Army Quartermaster Corps was the War Department's Cantonment Division on-site representative. Construction began on June 10, 1917, but was promptly halted.

The DuPont Company (then Du Pont de Nemours and Company) filed a protest with the federal government seeking to prevent the construction of the camp. DuPont operated a large manufacturing facility in nearby Hopewell that produced gun cotton, a key component for munitions. The company feared that the construction of the camp would have a negative impact on their 28,000-member workforce and the rail networks supporting their operations.

Eager to reap the economic benefits of the camp's construction, the city of Petersburg promptly sent a delegation to Washington, D.C. The delegation successfully had the injunction lifted, and building of the camp began in earnest on June 21, 1917. Construction moved into high gear, and within 60 days, the first barracks were ready for occupation.

The camp was laid out in a horseshoe shape roughly four miles long. Sixteen million linear feet of lumber was ordered to build the more than 3,000 buildings on the cantonment.

More than 50 types of buildings were required, including 1,500 200-man barracks, a thousand-bed hospital composed of 40 buildings with two operating theaters, 10 large warehouses, numerous orderly rooms, headquarters buildings, and even a large incinerator facility.

Seven hundred horse- and mule-drawn wagon teams worked steadily to haul materials to the building site until a railroad line could be laid into the camp. Nine miles of roads and over 30 miles of sewer and water lines supported the cantonment. A workforce that eventually numbered

13,000 men battled chronic material shortages while trying to meet the construction schedule.

When a nationwide shortage of railroad boxcars prevented the delivery of the plumbing fixtures needed for the buildings, the Army arranged for the sinks and toilets to be brought from the manufacturer in commandeered civilian passenger cars.

The feverish pace of construction was in full swing when the camp acquired its official name in midsummer. On July 15, 1917, the Army designated the cantonment Camp Lee. Named for Robert E. Lee, the most famous Confederate general of the Civil War and a native son of the Commonwealth of Virginia, Camp Lee reflected the convention of the times, which favored naming cantonments south of the Mason-Dixon Line for Confederate generals. (The presence of influential southern Democratic senators on the major committees in Congress was a significant factor.)

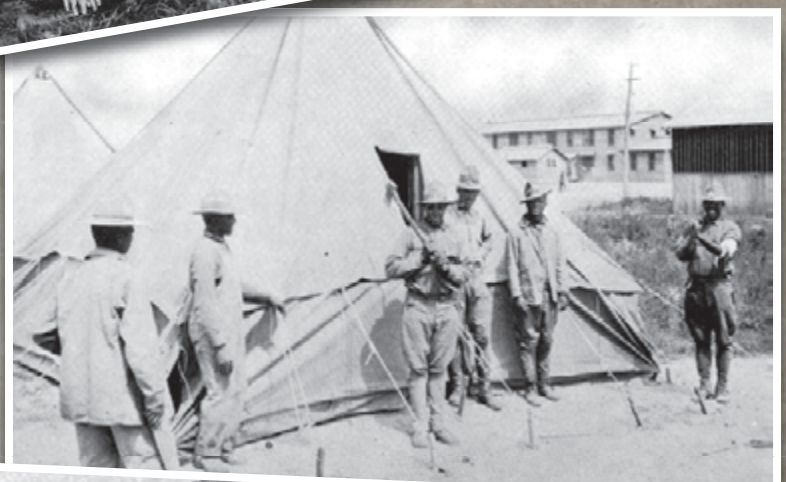
With a capacity for 60,335 men, Camp Lee, was the second largest cantonment constructed in the country. (Ironically, only Camp Grant in Illinois exceeded Camp Lee in capacity.) The building of Camp Lee was well underway when the first troops began arriving in August 1917.

Training at Camp Lee

Built to support the training of one of the newly raised National Army divisions, Camp Lee was designated the home of the 80th Division. Composed predominately of volunteers from Virginia, West Virginia, and western Pennsylvania, the "Blue Ridge Division" officially unfurled its colors on August 5, 1917.

Maj. Gen. Adelbert Cronkhite, the division commander, established the division headquarters in the "White House," the only permanent residence on the base. (Known today as Davis House, the building is still used for distinguished visitor lodging.) Training soon began as new arrivals continued to swell the ranks.

In World War I, U.S. Army divi-



sions were organized around two infantry brigades, each with two or more infantry regiments. Known as a "square division," a U.S. division numbered between 23,000 and 28,000 Soldiers and was twice the size of a British, French, or German army division.

In the 80th Division, the 159th Brigade, composed of the 317th and 318th Infantry Regiments and the 313th Machine Gun Battalion, and the 160th Brigade, made up of the 319th and 320th Infantry Regiments and the 315th Machine Gun Battalion, formed the maneuver elements. The 156th Field Artillery Brigade, comprising the 313th, 314th, and 315th Field Artillery Battalions, provided direct-fire support to the brigades. Shortages of equipment and the inexperience of the volunteers dictated the training program.

While at Camp Lee, the officers and noncommissioned officers of the 80th Division trained volunteers in basic Soldier and combat skills prior to their deployment overseas. Once the Soldiers arrived in France, more advanced unit training would be conducted before commencing combat operations. Essentially, the cadre of the 80th Division conducted basic and advanced individual training called the "School of the Soldier" in preparation for their deployment, which was scheduled for the spring of 1918.

The Blue Ridge Division sailed for France on June 8, 1918. It would be 12 months before the men would set foot on U.S. soil again. After the Blue Ridge Division's departure, the 37th "Buckeye Division" of the Ohio National Guard spent several weeks training at Camp Lee before its own departure for France.

For the remainder of the summer and fall of 1918, Camp Lee was home to a continuous stream of individual replacements. A training program for infantry officers was conducted and basic combat training for new enlisted men was held. A steady population of more than 40,000 troops trained at Camp Lee

until the signing of the armistice on November 11, 1918, brought the war to an abrupt halt.

The 80th Division returned from France on board the *USS Zeppelin*, which landed in Norfolk, Virginia, on May 28, 1919. The division had earned a well-deserved reputation as one of the most effective combat units in the U.S. Army. It fought in the Somme and Saint-Mihiel Offensives and was the only U.S. division to take part in all three phases of the massive Meuse-Argonne Campaign.

This hard fighting cost the division 6,029 casualties, including 880 dead and 5,149 wounded. Following a rapid demobilization, the Blue Ridge Division was inactivated at Camp Lee on June 26, 1919.

With the inactivation of the 80th Division, the first phase of Camp Lee's existence had come full circle. After World War I, the United States systematically closed many of the cantonments constructed during the mobilization. Camp Lee was no exception; in 1921, the land and buildings were turned over to the Commonwealth of Virginia.

All of the buildings with the exception of the White House were torn down and the land was reverted to a state game and forest preserve. A portion of the land that included an extensive network of training trenches was incorporated into the Petersburg National Battlefield. Twenty years later, with war clouds again gathering on the horizon, Camp Lee would be reconstructed to begin the second phase of its life as a training camp for World War II.

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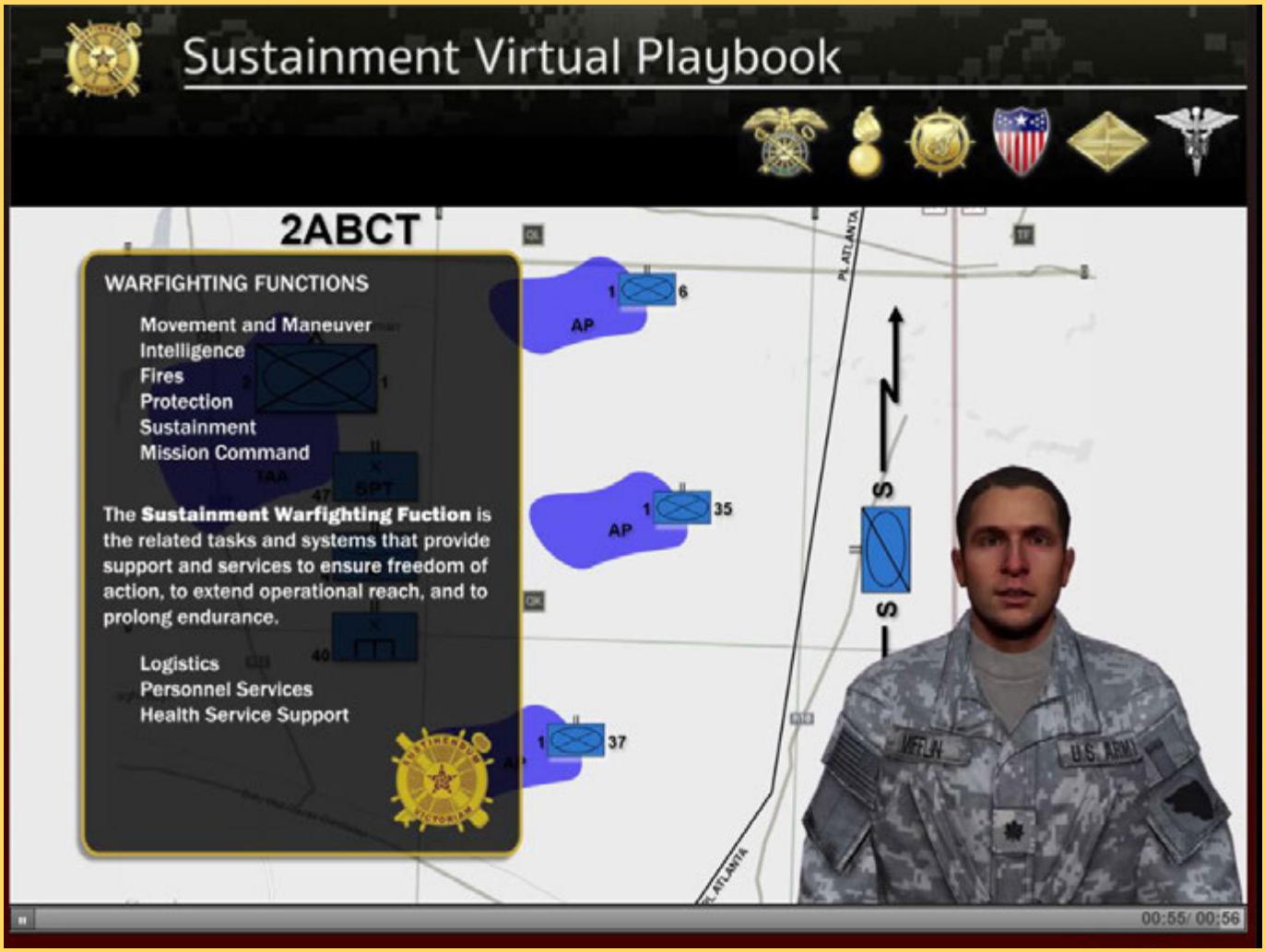

The Sustainment Virtual Playbook is an interactive, mobile, e-learning solution to living doctrine. It delivers doctrinal and best practice tactics, techniques, and procedures for executing synchronized sustainment in a decisive action environment. The playbook provides the tools to think through complex sustainment processes that enable freedom of action, extend operational reach, and prolong endurance. For more information or to work through the scenarios, go to http://www.cascom.army.mil/g_staff/g3/SVPB/.