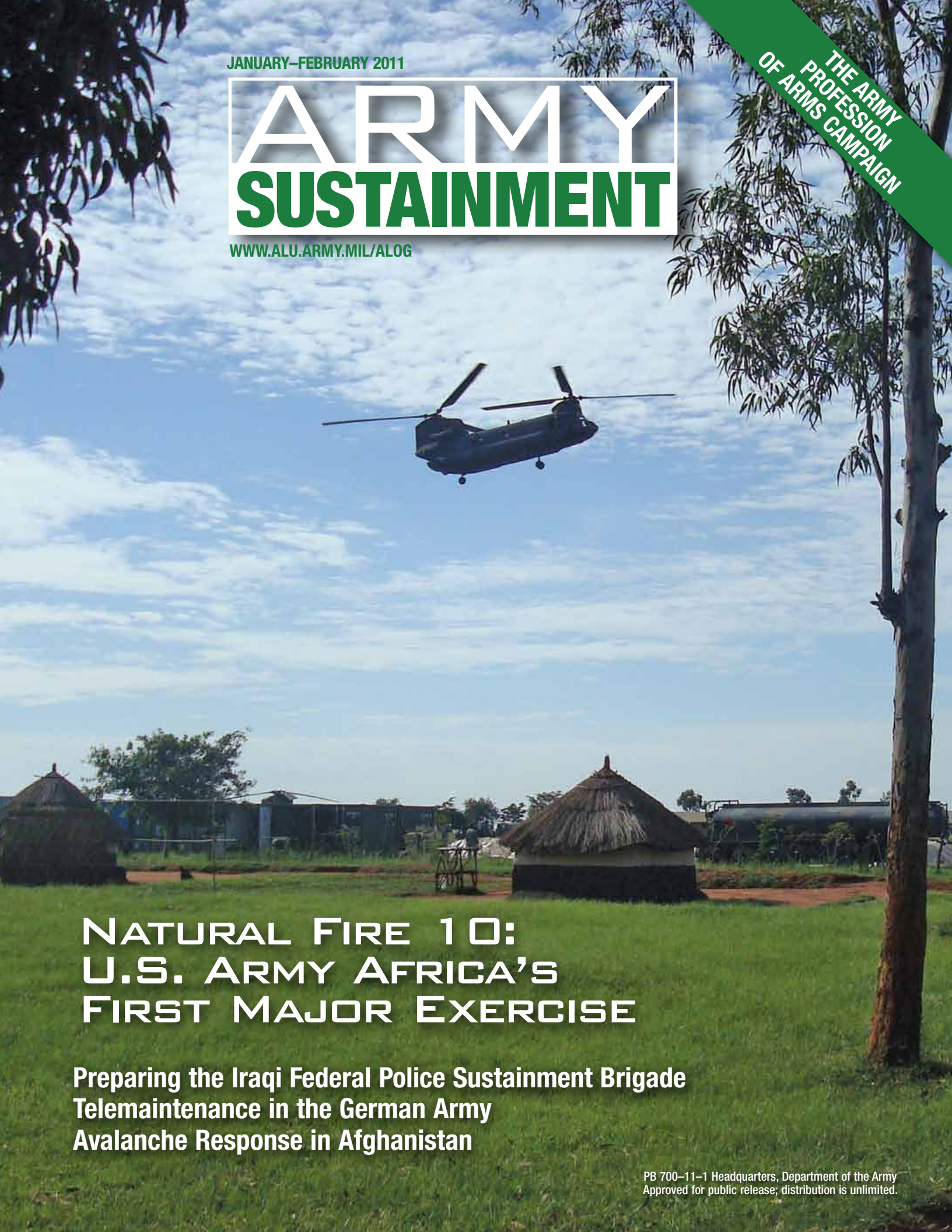
JANUARY–FEBRUARY 2011

ARMY SUSTAINMENT

WWW.ALU.ARMY.MIL/ALOG

THE ARMY PROFESSION OF ARMS CAMPAIGN



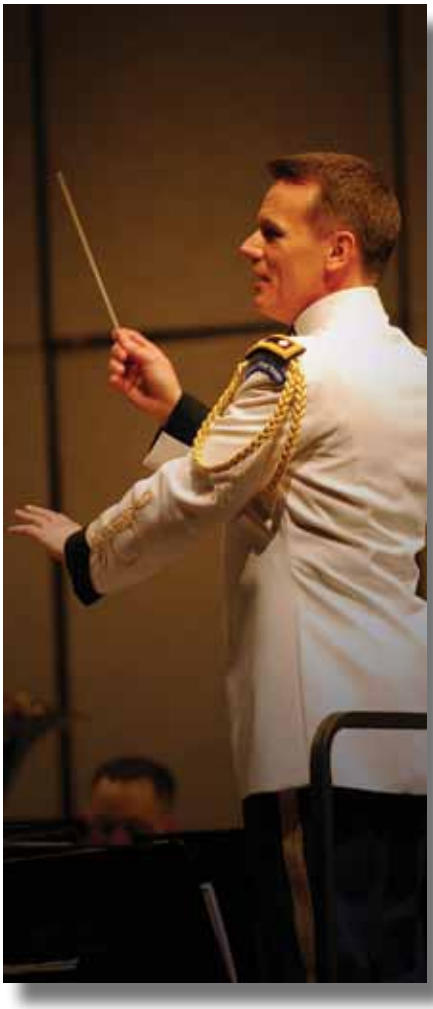
Natural Fire 10: U.S. Army Africa's First Major Exercise

Preparing the Iraqi Federal Police Sustainment Brigade

Telemaintenance in the German Army

Avalanche Response in Afghanistan

PB 700–11–1 Headquarters, Department of the Army
Approved for public release; distribution is unlimited.



PAGE 44

Cover: Natural Fire 10 was the first major exercise for U.S. Army Africa (USARAF), the Army service component command of the U.S. Africa Command, and it was the largest deployment of U.S. forces in Africa since World War II. Africa presents physical, administrative, and cultural challenges to deploying U.S. forces. As described in the article beginning on page **34**, USARAF overcame these challenges by using the adaptive logistics network concept, which maximized the use of existing systems on the continent. In the cover photo, a CH–47 Chinook helicopter approaches Kitgum, Uganda. Kitgum is the headquarters of the 401st Brigade of the Ugandan Peoples Defense Force and the site of the exercise. *(Photo by SSG Horace Murray)*

ARMY SUSTAINMENT

PB 700–11–01
VOLUME 43
ISSUE 1
JANUARY–FEBRUARY
2011
www.alu.army.mil/alog

PAGE 23

Army Sustainment (ISSN 2153–5973) is a bimonthly professional bulletin published by the Army Logistics University, 2401 Quarters Road, Fort Lee, Virginia 23801–1705. Periodicals postage is paid at Petersburg, VA 23804–9998, and at additional mailing offices.

Mission: *Army Sustainment* is the Department of the Army's official professional bulletin on sustainment. Its mission is to publish timely, authoritative information on Army and Defense sustainment plans, programs, policies, operations, procedures, and doctrine for the benefit of all sustainment personnel. Its purpose is to provide a forum for the exchange of information and expression of original, creative, innovative thought on sustainment functions.

Disclaimer: Articles express opinions of authors, not the Department of Defense or any of its agencies, and do not change or supersede official Army publications. The masculine pronoun may refer to either gender.

Reprints: Articles may be reprinted with credit to *Army Sustainment* and the author(s), except when copyright is indicated.

Distribution: Units may obtain copies through the initial distribution system (DA Form 12 series). Private domestic subscriptions are available at $23.00 per year by writing to the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250–7954, or by visiting http://bookstore.gpo.gov on the Web. For credit card orders, call (866) 512–1800. Subscribers should submit address changes directly to *Army Sustainment* (see address below). *Army Sustainment* also is available on the World Wide Web at http://www.alu.army.mil/alog.

Postmaster: Send address changes to: EDITOR ARMY SUSTAINMENT/ALU/2401 QUARTERS RD/FT LEE VA 23801–1705.

This medium is approved for the official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR
General, United States Army
Chief of Staff

Official: Joyce E. Morrow

JOYCE E. MORROW
Administrative Assistant to the Secretary of the Army
1033607

EPLY TO
TTENTION OF

DEPARTMENT OF THE ARMY
UNITED STATES ARMY COMBINED ARMS SUPPORT COMMAND
SUSTAINMENT CENTER OF EXCELLENCE
2221 ADAMS AVENUE
FORT LEE, VIRGINIA 23801-2102

November 2, 2010

Dear *Army Sustainment* Readers:

Since the terrorist attacks of September 11, 2001, our Army has been engaged in a process of transformation as it has simultaneously prosecuted two wars. This transformation has profoundly affected Soldiers and Civilians in logistics, personnel services, and health service support positions by bringing them together in units and organizations dedicated to the common purpose of supporting commanders across the full spectrum of operations.

In this environment of rapid change and new challenges, it is crucial that military and civilian sustainers stay abreast of the latest developments and share their experiences and lessons learned with the larger sustainment community. For the sustainer, professional development can never end. One excellent forum for learning and sharing is *Army Sustainment*, the professional bulletin for the sustainment warfighting function.

As the commander of the U.S. Army Combined Arms Support Command and Sustainment Center of Excellence, I have assumed the collateral duty of serving as Chairman of the Board of Directors for the *Army Sustainment* Board of Directors. In this role, I encourage all of my fellow sustainers to support *Army Sustainment* as our journal.

Army Sustainment has changed in the last 2 years in ways that parallel the larger changes in the sustainment community. In 2009, what had been published for 40 years as *Army Logistician* transformed to become *Army Sustainment*. This has meant expanding the bulletin's subject matter beyond the traditional logistics branches (Quartermaster, Ordnance, and Transportation) to incorporate the functions of human resources and financial management and the medical logistics function of health service support. This transformation can be successful only if it is supported by all sustainers.

I urge you not only to read *Army Sustainment* but also to use it to share your thoughts and your suggestions for doing things better. Publishing an article in *Army Sustainment* looks good on your resumé, but it also may provide the information your sustainment colleagues may need to meet their challenges. Additional information, as well as copies of back issues of *Army Sustainment,* are available on the Web at www.alu.army.mil/alog.

JAMES L. HODGE
Major General, U.S. Army
Commanding

The Army Profession of Arms Campaign:
A Year of Dialog After a Decade of Conflict

The Army has been at war in Afghanistan and Iraq for more than 9 years. While prosecuting these conflicts, the Army has also been engaged in a major transformation, reorganizing as a modular force and aligning operations to the Army Force Generation (ARFORGEN) process. The Army's senior leaders recognize that, after this period of changes and challenges, the time is ripe for institutional reflection and self-examination. So the Army Chief of Staff, General George W. Casey, Jr., has directed General Martin E. Dempsey, the commander of the Army Training and Doctrine Command, to lead a study and foster a dialog to answer threeat fundamental questions:

- What does it mean for the Army to be a profession of arms?
- What does it mean to be a professional Soldier?
- After 9 years of war, how are we as individual professionals and as a profession meeting these aspirations?

The resulting Army Profession of Arms Campaign, announced at the annual meeting of the Association of the United States Army (AUSA) in Washington, D.C., last October, seeks to involve personnel in all Army cohorts—officers, warrant officers, noncommissioned officers, enlisted Soldiers, and civilians—in an examination of the Army's professional identity.

When introducing the campaign at the AUSA meeting, Lieutenant General Robert L. Caslen, Jr., commander of the Army Combined Arms Center at Fort Leavenworth, Kansas, noted—

> There actually have been a number of studies on the profession of arms over the years. Many of them were officer-centric. One of the more famous studies [was] in 1970, when the Chief of Staff of the Army, [General William] Westmoreland, went ahead and had done a study. That particular study was in reaction to a problem that was occurring within the officer corps at the end of Vietnam. And General Casey would be eager to say that our study today is not because of a problem, to address a problem. Our study today is to understand what our profession is. We have a tremendous opportunity with the all-volunteer Army to understand this profession and then, as another outcome, to prevent a problem.

The campaign will be conducted over the next year along three lines of operation: assess, dialog, and review.

The Profession of Arms

The Army is an American Profession of Arms, a vocation comprised of experts certified in the ethical application of land combat power, serving under civilian authority, entrusted to defend the Constitution and the rights and interests of the American people.

The Professional Soldier

An American Professional Soldier is an expert, a volunteer certified in the Profession of Arms, bonded with comrades in a shared identity and culture of sacrifice and service to the nation and the Constitution, who adheres to the highest ethical standards and is a steward of the future of the Army profession.

Assess. According to General Caslen, the initial step of assessment will allow the Army "to understand where our force is and to survey and ask the tough questions."

Dialog. Assessment will be followed by discussion involving all levels of the Army. The campaign is intended to be a bottom-up, not a top-down, process. As General Caslen observed, "This discussion really needs to take place at all echelons in our Army and to really embrace all levels of the Army."

Review. This final step in the campaign will take stock of the assessments and discussions, allowing the Army, in General Caslen's words, to "understand how all of what we have learned affects our doctrine, how it affects our organizations, how it affects our leader development, [and] how it affects our training."

The first half of 2011 will largely be devoted to assessment, with findings presented in conjunction with the Army's birthday in June. The second half of the year will focus on discussions, with findings and recommendations presented to a conference of four-star generals at the end of the year. "The product of this study," according to General Caslen, "is going to be to develop…the doctrine, the organization, the leader development of what really needs to take place in order to develop a professional force."

As part of the Army Profession of Arms Campaign, *Army Sustainment* readers are encouraged to submit articles on the campaign's two fundamental questions. If you would like to write an article for the discussion, please first contact the editor at robert.paulus@us.army.mil.

Preparing the Iraqi Federal Police Sustainment Brigade for the Future

BY MAJOR HENRY S. GROULX

The transition team working with the Iraqi Federal Police Sustainment Brigade had an interesting challenge: to teach police officers who were not logisticians how to execute a logistics operation.

There we were, sitting in a smoke-filled conference room on an Iraqi Federal Police (FP) compound in central Baghdad. Our 12-person transition team was in the middle of the relief in place/transfer of authority with the outgoing team, and we were getting our in-brief from the unit we would be advising. "The previous transition team helped us to progress to a highly functioning unit; we hope the incoming team will help us get to the next level," said Brigadier General Ala'a Norri Yassen, the Iraqi Federal Police Sustainment Brigade (FPSB) commander.

With that in mind, we quickly came to the conclusion that to get the FPSB to the next level, we would focus our efforts on programs and systems that would ultimately lead to one overarching goal—to make the FPSB a self-sustaining organization.

During its time in Iraq, the transition team helped the FPSB become a more self-sufficient organization by establishing certified schoolhouses and train-the-trainer programs, establishing fix-forward maintenance support, conducting regular leader development training and logistics conferences, and developing sustainment battalions.

FPSB Organization

The FPSB is a logistics unit staffed with policemen (*shurta*) who have no formal logistics training. It resembles a U.S. Army brigade support battalion, with a headquarters section and four functional battalions (maintenance, logistics, transportation and fuel, and medical).

The FPSB provides logistics support to FP units (the FP headquarters and four divisions) comprising nearly 43,000 personnel. The brigade works directly with the Ministry of Interior (MoI) to request and receive logistics support and supplies for the FP units and coordinate the distribution of materials.

Federal Police students graduate from the Basic High-Mobility Multipurpose Wheeled Vehicle Maintenance Training Course that was taught by U.S. subject-matter experts.

Schoolhouses and Train-the-Trainer Programs

The first self-sustaining course was the Instructor Drivers Trainer Course. Our transition team initially developed, resourced, and executed this course. After a few months of data collecting, we found that many of the FP high-mobility multipurpose wheeled vehicle (HMMWV) mechanical problems could be prevented at the operator level.

To address this, we convinced the FP leaders to partner with us in a train-the-trainer program for HMMWV operators. The course was designed to educate 50 *shurta* on the basic principles of HMMWV operations, such as preventive maintenance checks and services, driving operations, and safety. The course also certified these *shurta* as instructors so they could conduct the class for others in the FP force. This program was a great success for the FP trainers. They now conduct sessions on their own, certifying additional *shurta* as licensed HMMWV operators. The FP leaders also have developed their own doctrine based on the training course.

The FPSB developed the Basic Medic Course, which is based on the U.S. Army's Basic Medic Course taught at Fort Sam Houston, Texas. In a combined effort, our transition team, the Iraqi Transition and Assistance Mission Surgeon's Office, and the FP leaders and medical staff transformed a previously unused building into a medical training facility with a full spectrum of training aids (from bandages to computerized mannequins).

The 6-week training course accommodates up to 40 students per session. After completing the course, students are certified (under the authorization of the MoI) as fully qualified medics. The MoI fully supports the facility and the instruction it provides. This ensures that long-term support and stability will be provided for years to come.

The third significant training program that the FPSB established is the maintenance training and repair school. The transition team assisted in procuring a U.S.-funded contract that established a training facility at the old Muthana Airfield in central Baghdad. Over the next year, 150 mechanics and 50 mechanic instructors trained and returned to their FP units to supervise and instruct their units' maintenance operations. The trained mechanics have the skills to conduct most of the –10- and –20-level tasks that were performed by the FP maintenance battalion. This allows the maintenance battalion to focus on major repairs and, in turn, create a more productive maintenance program throughout the FP.

Fix-Forward Maintenance Program

The second major achievement enabling the FPSB to become a self-sufficient organization was the establishment of a fix-forward maintenance program. In the maintenance battalion, we initially found an organization that was functioning adequately and had very capable and skilled mechanics but was not supporting its customers in the most effective manner.

The FPSB leaders had implemented a maintenance program in which all maintenance, no matter how trivial, was conducted by the maintenance battalion only at the battalion's location. This included procedures such as changing tires and batteries, fixing headlights, and other tasks that normally would be considered operator-level tasks.

We presented the FPSB with the concept of conducting more fix-forward maintenance work by sending out maintenance support teams to the units rather than having every vehicle evacuated back to the maintenance battalion. The FPSB leaders initially resisted the concept, but they eventually gave it a try.

The FP 3d Division, located in Mosul, was the first to execute this concept. We convinced the FP leaders that fixing the vehicles forward in Mosul would allow those units to remain in the fight and not have to be pulled back to conduct sustainment missions. After agreeing, the FP maintenance battalion put together an inspection team that went to Mosul to identify the maintenance requirements for the fleet there and develop a list of the parts needed to bring up deadlined vehicles. Once the inspections were complete, the team returned to Baghdad, got the needed parts and mechanics, and returned to Mosul to fix the vehicles. All 33 of the deadlined vehicles were repaired.

The FPSB embraced this system and finished repairs on all of the 3d Division's HMMWVs. Once this was complete, the FPSB began with maintenance of the 1st Division's vehicles and worked its way through those of the 2d and 4th Divisions.

Professional Logistics Conferences

The third major milestone achieved by the FPSB was the establishment of professional logistics conferences.

In the FPSB logistics battalion, we found that what appeared on the surface to be a very simplistic logistics system was actually a sophisticated and detailed supply process. For a unit that provides general supply support to an organization of 43,000 personnel, everything seemed very small. Storage capacity was limited to about 20 shipping and storage containers and a handful of buildings. The offices were clean and tidy, despite the volume of paperwork that crossed each desk daily. As we became more familiar with the operation, we saw that units were not receiving supplies for two reasons: a lack of understanding of the system and a lack of supplies coming from the MoI level.

The FP is still a relatively new organization, and its supply system has only been functional for a few years, so the processes were still unfamiliar to some units. As we watched and learned the process for requesting and receiving supplies, we shared that information with the transition teams throughout Iraq

Iraqi Federal Police trainers conduct their first Iraqi-led Combat Lifesaver Course. These trainers were certified by U.S. instructors using the train-the-trainer technique.

to guide their FP counterparts in the direction that the FPSB was moving. As the ways in which coalition forces could provide direct support to their Iraqi counterparts became increasingly restricted, this knowledge provided transition teams with the tools to help their FP counterparts rely on their own supply system for support.

The FPSB also embraced the idea of a monthly logistics conference as a forum for answering units' questions and sharing information. The FPSB decided to have two monthly conferences—one for logistics and one for maintenance and transportation. The conferences began as a combined effort between U.S. transition teams and their FP counterparts, but by the second month of conferences, the FPs had made the events their own. The FPSB now hosts these conferences monthly, and although attendance by the FP logistics officers is high, the U.S. presence there is very limited. The lack of U.S. forces' involvement is a prominent indicator of the success and sustainability of these conferences.

Sustainment Battalions

One reason units were not receiving supplies was the lack of predictable resupply from the MoI. As an organization that is not constitutionally recognized, every request for supplies that the FP submits to the MoI is treated as an unfunded requirement. This means that the MoI does not establish a standard allotment of supplies for FPs. Instead, everything must be asked for and issued at the MoI's discretion.

Although the logistics battalion is an effective organization, the limited availability of supplies cannot support the quantity of supplies needed to keep the FP running, especially as it continues to grow. FP leaders realized this and began developing sustainment battalions at each division. Through numerous visits and phone calls by both the U.S. transition teams and the FPSB leaders, the FPs have established these new battalions to mirror the sustainment brigade on a smaller level.

The transition team's efforts in assisting and advising the FPSB have helped it become a much more effective and self-sufficient organization. The FP's potential is unlimited. It has a system that works and will expand to support any needs that arise. The FP leaders are devoted to supporting the policemen at the lowest levels and have intentionally built checks and balances into their supply system to discourage corruption. They are focused on accountability. The foundation for their future success rests in their commitment to teach and train so that personnel at all levels understand the process.

As my team departed, we asked ourselves how we accomplished the things we did. We listened to our counterparts and did not waste time on things we "thought" would be good for them but instead recommended courses of action based on what they wanted (within reason and especially within budget). What might make sense and be a feasible course of action for U.S. forces may actually be more trouble than it is worth to our Iraqi counterparts. They have to live with the great ideas and their second and third order effects while we go home in a year. How did we determine what was really best for them? We just asked!

Major Henry S. Groulx is attending the Army Command and General Staff College. He deployed to Iraq as the team chief of a military transition team assigned to mentor and advise the Iraqi Federal Police Sustainment Brigade and Iraqi Federal Police Explosive Ordnance Disposal Directorate. He holds a bachelor's degree from the University of North Carolina at Charlotte and is a graduate of the Armor Officer Basic Course, Scout Platoon Leaders Course, and Tank Commanders Certification Course.

Telemaintenance:
Transferring Knowledge to the Field

BY COLONEL (RET.) ERICH POKORNY, GERMAN ARMY

In the current operational environment, the German Army needs a way to exchange maintenance information and provide expertise to soldiers in the field, regardless of time or geographical distance. Its solution is a system known as "telemaintenance."

The German armed forces, when conducting international missions, require fast-acting and efficient logistics support at all locations—even during crisis situations—and the presence of military logistics commanders at the front line. Logistics support must also be accomplished under difficult environmental conditions across the entire spectrum of modern warfare operations.

Approximately 80 percent of current operations are ground based. This does not mean that these operations are solely army operations, although ground forces usually perform most of the work in these situations. The Federal Defense Force—the *Bundeswehr*—currently conducts many operations in remote and outlying areas far from Germany under conditions that resemble expeditionary missions.

The environment of these operations is usually "asymmetric" and is not separated into forward and rear areas, but only operational areas. Missions like these demand a comprehensive presence and thus an appropriate deployment of forces into the operational area. The environmental conditions facing these forces can be harsh and demanding for both personnel and materiel. It therefore may be necessary to use weapon systems and equipment in ways for which they were not designed.

Basic Operational Conditions

In operations, troops are sometimes confronted with weapon systems and equipment that come directly from the manufacturers, which means that the repairers sometimes are not sufficiently familiar with them. These systems are usually complex and are used along with aged systems that have different designs.

The troops can be confronted with weapon systems and equipment that do not correspond to their organic equipment. Depending on the situation, the troops may also have to work with commercial off-the-shelf equipment.

The variety of materiel, along with the introduction of new products, can cause a significant increase in technical complexity. Increased complexity demands increased specialization and qualifications on the part of the maintenance forces, better repair equipment, and better maintenance procedures. Effective support of forces while conserving resources requires access to technical experience, which may be available only from civilian sources. In such cases, the use of civilian logistics support is indispensable.

Industry personnel can substitute for military personnel because of their connection to the product, in particular with materiel that is not yet completely operational. However, the employment of civilian contractors has its limits since, in an acute threat situation, military operations can change rapidly between escalation and de-escalation. During an escalation phase, civilian technicians often will not be available on location. As a fallback in such situations, logistics support must be provided by military forces. Since military personnel generally are not experts on the equipment, they must be supported by knowledgeable experts from the outside as needed.

Battle Damage Repair

The German maintenance concept for operations abroad is called the "materiel rescue chain." In this chain, a system maintenance sergeant in each unit is the initial repair specialist in the field. He evaluates damage, assesses the extent of the repair measures required, and suggests the best place for executing the remedy in view of tactical requirements. He leads a battle damage repair (BDR) crew, which is qualified to quickly restore a vehicle or system's basic functions so that it can continue the current mission.

Stabilization operations, such as the International Security Assistance Force (ISAF) in Afghanistan, are not tied to a certain place. Forces deploy, reconnoiter, and operate jointly across the entire operational spectrum. Opposing forces pose a constant threat, and the threat situation differs by region.

At present, in operational areas, most convoys leave their field camps with a BDR crew. If required by the

situation, logistics battalions can support combat units with their maintenance personnel. Repair of significant damage is conducted at forward support bases, where specialized civilian contractors are also available.

Vehicle damage and losses are part of daily business. It is not possible to leave a broken-down vehicle behind and send back mobile repair forces without providing protection for the recovery effort. The vehicle operator is responsible for the initial management of a loss. However, he will usually need expert support, which will often not be available quickly because of the wide dispersion of deployed forces.

As a result, repair squads from the forward logistics base or even from Germany sometimes must be deployed to repair damaged vehicles. That causes additional resource-consuming flows of materiel and personnel into the operational area and often leads to extended downtimes before the vehicle or system can be returned to service.

Telemaintenance

Because such a wide variety of equipment, vehicles, and other items exist in today's operational areas, specialists cannot be deployed for each of them. Therefore, the primary repairman in the field is a sufficiently trained operational soldier who has immediate support that enables him to perform his complex mission. An exchange of information and knowledge transfer among deployed task forces and *Bundeswehr* and industry experts must be possible—regardless of time or geographical distance.

The German Army School of Land Systems Engineering and Army School of Engineering (TSL/FSHT) has developed a solution called "telemaintenance" that allows a transfer of expert knowledge to the troops abroad.

The term telemaintenance is vague and not yet defined. Some use it to refer solely to remote maintenance and repair, while others include other aspects of maintenance under the same term. The approach of the TSL/FSHT includes much more than just remote technical support. It also refers to a system that uses existing capabilities and seeks to improve and automate the performance of those capabilities. This telemaintenance system is characterized by the terms "prognosis," "diagnosis," and "monitoring and repair." (See definitions in the chart below.)

What Telemaintenance Does

BDR and routine maintenance both begin with the operator and continue with extended and specific expert assessment using the materiel rescue chain that includes the system maintenance sergeant and his technical squad.

At the operator level—the first link in the repair chain—diagnostic data from the internal test system must be made accessible to the operator, the local technicians, and the remote experts as needed. These data provide an exact technical situation report and support efforts to eliminate failures or repair damage over the remote system if necessary.

Another option is consultation with the operator after a system fails or is damaged to describe the limitations of the system or point out necessary actions. Thus, the operator will not be left alone in a critical situation.

The system maintenance sergeant and his team at a maintenance facility in the operational area are the next link in the repair chain. The sergeant must examine a multitude of systems and repair damages on short notice. Especially in the case of commercial off-the-shelf products, the knowledge of the local logistics specialists is limited and requires access to information and data from sources outside of the operational area. This requires a support center, in the form of a "*Bundeswehr* Technical Helpdesk," as a single point of contact for external support. This element must have access to knowledge-based databases. Contact with industry, for example in the form of manufacturer hotlines and manufacturer databases, must also be available.

Prognosis refers to the ability to predict the failure probability of assemblies in order to ensure the highest possible operational readiness in the context of a dynamic, condition-based maintenance.

Diagnosis refers to the ability to clearly locate failure causes in a system. The screening must ensure that the results are so substantial that the necessary spare parts and the place and the echelon of repair can be determined based on the estimated repair time.

Monitoring refers to the ability to know the actual condition of devices and systems and the possibility of including this information in tactical and operational planning and the materiel flow process.

Repair refers to the ability to quickly repair and maintain all land systems at any location.

Logistics support forces in operational situations require extensive maintenance and repair capabilities. The telemaintenance system is the logistics system's response to current and future challenges.

Telemaintenance Modules

The telemaintenance system works through several modules. Module 1A, "Monitoring and Prognosis," consists of a built-in display and control unit in the vehicle that monitors and displays the current operating condition of the vehicle. Indicators for preventive maintenance measures are available and internal tests are possible, enabling predictive and reliability-oriented maintenance that results in increased system availability.

The operator can also obtain further information, such as fluid levels, fuel ranges, and technical readiness status. This information, which is also important from a tactical viewpoint, can be used by the tactical network if required. The system is based on an onboard diagnostic unit in the vehicle.

Module 1B, which also relies on information in the vehicle's diagnostic unit, enables the operators to request direct telemetric support from the system maintenance sergeant. The data are stored and are used as the basis for an electronic equipment lifecycle file.

Module 2 enables remote support by the system maintenance sergeant through onsite fault diagnosis and remote support, including technical expertise, provided by repair personnel in the maintenance facility. This provides a quick damage assessment and repair time estimate, expedites a decision on the location of repair, and contributes effectively to the development of equipment-related expertise.

Module 3 links the users of the telemaintenance system from the tactical level up to the level of the *Bundeswehr* Technical Helpdesk. Depending on the situation, voice and data communication may be necessary. Such communication requires a network of suitable communications systems that provide the necessary redundancy, flexibility, security, and mobility.

Module 4 allows the logistics inland base to make a logistics knowledge database available to users. It provides a central interface function for the operator, regional repair personnel, and industry. The *Bundeswehr* Technical Helpdesk-Land Systems should act as a single point of contact and should be able to assist with the technical problems that can occur in the materiel rescue chain.

Module 5 is an integrated demonstrator that connects to all the other modules. This demonstrator is designed to facilitate further insights into the primary fundamental functional requirements for a future telemaintenance system.

Current Status

The telemaintenance initiative has been accepted "in principle" by the Integrated Working Group for Capability Analysis within the Federal Ministry of Defense. The development of a phase document that describes the functional requirements for remote support of maintenance has been initiated. The components are outlined in the telemaintenance manual, military requirements are addressed, and further development steps are depicted.

This development process allows for connecting factors for the military and its partners to be identified. The system demonstrator could be successfully presented during field exercises. Three nontechnical studies also have been initiated. Within the ISAF deployment, a communications system technique is being tested to gain initial experiences from operations.

Integration of the capabilities of the condition monitoring and prognosis systems into the combat-essential requirements for vehicles and other equipment is likely. Questions about knowledge management continue to be examined, issues about the proprietorship of data need to be clarified, and a telemaintenance concept must be developed.

Logistics support forces in operational situations require extensive maintenance and repair capabilities. The telemaintenance system is the logistics system's response to current and future challenges. The telemaintenance approach discussed here and its conceptual basic structure can ensure that innovations that are technically feasible, logistically inevitable, tactically necessary, and economically desirable can be introduced with minimal developmental risk.

Colonel Erich Pokorny was the head of the Force Development Division of Army Operational Logistics and Land Systems Engineering at the School of Land Systems Engineering and Army School of Engineering in Aachen, Germany, until his retirement last August.

Training a Combat Sustainment Support Battalion

BY DR. JOHN M. MENTER

The Distributive Battle Simulation Program helped a Virginia Army National Guard sustainment unit go from home station to the battlefield.

In July 2008, the 529th Combat Sustainment Support Battalion (CSSB), Virginia Army National Guard, began its journey toward mobilization by attending the 1st Army Joint Assessment Conference (JAC). At that time, the unit was under the assumption that it would deploy in support of Operation Iraqi Freedom (OIF). This was confirmed shortly thereafter when the battalion commander, Lieutenant Colonel Michelle Rose, was informed that in early 2010 the 529th would replace the 515th CSSB, an Army National Guard unit from New Mexico, at Forward Operating Base (FOB) Marez.

Deploying in support of operations in Iraq and Afghanistan is quite common, but the 529th CSSB had an additional challenge: It was a fairly new unit. Not only was it a new unit for the Virginia National Guard (formed in December 2006) but also, as a CSSB, it was a rather new organization for the Army. Of the 84 CSSBs formed in 2006 within the Army force structure, 48 are Army National Guard units. As a new unit, the 529th needed to understand the recently developed sustainment doctrine and the concept of modular sustainment formations and functions.

Distributive Battle Simulation Program

In December 2008, Lieutenant Colonel Rose contacted a commander's operations and training assistant (COTA) from the Army National Guard's Battle Command Training Capability Program's (BCTCP's) Distributive Battle Simulation Program (DBSP). DBSP operates under a contract established with General Dynamics Information Technology.

COTAs are former Army officers (Active or Reserve component) who work with selected units to advise unit commanders and staffs in training strategies and tactics, techniques, and procedures. COTAs typically work with maneuver units. At present, more than 120 COTAs located throughout the United States are available to provide advisory and training support to Army National Guard units, with a specific focus on those who are entering the fourth or fifth year of Army Force Generation.

DBSP also provides training aids, devices, simulators, and simulations to train soldiers on the simulation devices entrusted to Army National Guard units throughout the country. Rounding out this professional training team are technical support teams comprising systems administrators and database managers. These teams set up and synchronize the various digital and constructive wargaming devices used to simulate the conditions in which the unit desires to train.

Under the direction of the battalion commander, the full-time battalion executive officer developed the following three-pronged approach to prepare the battalion:

- Understand modular sustainment doctrine.
- Organize and develop the battle staff and tactical operations center (TOC).
- Train key personnel in the use of critical logistics automation systems required for battalion command and control.

These critical tasks were to be accomplished in addition to the many Virginia National Guard and 1st Army individual and collective tasks Soldiers are required to complete before arriving at the mobilization station.

Critical Tasks

The first critical task, understanding modular sustainment doctrine, was accomplished in January 2009 under the direction of the DBSP warfighting functional area team chief, who instructed the battalion command and staff in the methods of modern sustainment from the national levels, through the theater sustainment command and expeditionary sustainment command, down to the sustainment brigade—the unit that typically serves as a CSSB's higher headquarters. Additional classes were conducted to focus on the intricacies of support operations (providing concepts for staff roles and responsibilities), movement, and distribution operations.

With a firm understanding of modular sustainment doctrine, the unit was ready for its second challenge: the organization of its battle staff and TOC. Several CSSB tactical standing operating procedures (TACSOPs) were provided to the 529th CSSB to use as examples. The battalion settled on one developed by the 751st CSSB, a South Carolina-based unit serving at the time in Anbar Province, Iraq.

In April 2009, the 529th deployed to the National Maintenance Training Center (NMTC) at Camp Dodge, Iowa, for a 2-week battalion staff training rotation. The first week of training was devoted to teaching the battalion staff the fine art of the sustainment military decisionmaking process (MDMP) and training Soldiers

on various simulators (such as the Engagement Skills Trainer and Virtual Convoy Operations). The staff trained in a workshop environment and ran operation order (OPORD) scenarios through the MDMP's seven steps. The training culminated in the staff's presentation of a battalion OPORD.

To make the process even more interesting, the 190th CSSB (a Montana Army National Guard unit) participated in the briefings. Staff personnel from the 190th CSSB served as company commanders during the 529th CSSB's OPORD briefing and subsequent commander back briefs, and 529th CSSB personnel likewise participated in the 190th CSSB's OPORD briefing. During the second week, both battalions executed their OPORDs through a command post exercise using Janus, a combat simulation system, and wrapped up with an after-action review.

Although the NMTC rotation helped the battalion achieve the commander's first two objectives for preparing for deployment, the environment was largely analog and reminiscent of TOC operations during the Army of Excellence of the 1980s and 1990s, which featured paper maps, acetate overlays, and alcohol marking pens instead of computers. Camp Dodge was simply unable to provide experience in digital logistics command and control. Present-day sustainment units—especially those preparing for operations outside the continental United States—must be able to manage sustainment operations digitally.

So, to accomplish the third critical task, battalion personnel were sent off to schools to learn their crafts on the digital command and control systems, such as the Battle Command Sustainment Support System, Command Post of the Future (CPOF), and Maneuver Control System.

Final Training Exercise

In November 2009, the command used its final annual training period to complete the final 1st Army validation for deployment requirements at Fort Pickett, Virginia. Here, everything the command had trained on for the last 18 months was brought together in one final dress rehearsal exercise. This training event prepared the battalion for its final premobilization command post exercise (CPX).

By January 2010, the unit was ready for its CPX at the State Military Reservation in Virginia Beach, Virginia. During the previous week, a team from the BCTCP-Camp Dodge (which was responsible for the unit's prior CPOF training) set up a CPOF suite consisting of 15 systems. Working side by side with the DBSP technical support team, the Camp Dodge team set up company mail workstations and loaded the Battle Command Staff Trainer, which is used to manage convoy movements and enemy insurgent actions.

The Battle Command Staff Trainer records events that have affected CSSBs and transportation battalions to date in OIF. These events drove the scenarios that the battalion faced over the next 3 days. Two battle staff trainers assisted with TOC information flow, resolved issues concerning roles and responsibilities, and provided tracking charts or devices as needed. After participating in over 300 exercises, if a tracking chart had been created and was required for the exercise, the two trainers certainly had it available for use.

In a modified classroom, the battalion set up the TOC as it would function in OIF, and another room was arranged to support higher, adjacent, and lower units and house the digital systems experts in the event of any technical difficulties.

During the next 72 hours of the exercise, the battalion was exposed to scenarios it could expect once deployed, including improvised explosive device attacks, traffic accidents, contaminated fuel, and hazardous material spills. A sustainment brigade fragmentary order was issued daily so that the battalion plans section and battle staff had to develop new plans or alter existing plans.

"Push matrices" that replicated the sustainment brigade's distribution board were passed down to ensure that the battalion's support operations shop was aware of any changes to scheduled movements and could anticipate future missions. Finally, battlefield update briefs (BUAs) were conducted twice daily using the BCTCP CPOF suite. Even the battalion commander participated in a mock sustainment brigade BUA with her commander, who was sitting in an adjacent room. By the close of day 3, the battalion had experienced "a day in the life of a CSSB." It was a hectic day, but one in which the headquarters personnel dealt with everything thrown at them and performed admirably.

The 529th CSSB conducted an honest and forthright after-action review that helped it use the 60 remaining days to make final TACSOP adjustments before reporting to its mobilization station at Fort Hood, Texas. The entire command and the DBSP observer/trainer staff felt that the unit was prepared to perform its mission upon deployment. However, the CSSB had not yet received its mobilization order from the 1st Army.

Because of the initial deployment notification from 1st Army, the unit continued to prepare for its role in OIF throughout the exercise. Interestingly, when the unit's formal mobilization order arrived, the 529th CSSB learned that it would not deploy to Iraq as expected but instead to Afghanistan in support of Operation Enduring Freedom.

Dr. John M. Menter is a retired Army colonel and the team chief of the Warfighting Functional Area Team, Distributive Battle Simulation Program, Battle Command Training Capability Program, General Dynamics Information Technology. He holds a doctoral degree in history, a master's degree in logistics, and a master of business administration degree from the University of La Verne. In 2005, he qualified as a certified professional logistician through the Institute of Logistics Management. He is also the author of **The Sustainment Battle Staff and Military Decision Making Process Guide.***

The 377th Theater Sustainment Command Deployment/Redeployment Coordination Cell in Haiti

BY LIEUTENANT COLONEL MICHAEL J. PEREZ

Transporting military units from Haiti once their services are no longer needed requires careful coordination. The 377th Theater Sustainment Command is responsible for ensuring that all U.S. military units that deploy to Haiti return quickly and safely.

Following the 12 January 2010 earthquake in Haiti, U.S. forces deployed there as part of Operation Unified Response to help meet the needs of the Haitian people. The Joint Logistics Command-Haiti (JLC–H), manned by Soldiers of the 377th Theater Sustainment Command from Belle Chasse, Louisiana, was tasked with overseeing the "right-sizing" of the military forces serving in Haiti in support of the operation. This mission was accomplished by the deployment/redeployment coordination cell (DRCC).

The recovery plan for Haiti involves the United Nations, the U.S. Agency for International Development, and numerous multilateral, nongovernmental organizations. This conglomerate of aid givers works with the governments of Haiti and other countries to assist the people of Haiti. U.S. military forces are serving in a support role to these organizations. They supply capabilities that the aid organizations did not have in place. As the situation changes and these organizations bring their capabilities on line, the matching military capabilities are no longer needed.

Right-sizing the force involves sending units back to their home stations when their capabilities are no longer needed in the Haiti theater. This may seem like a simple task: put the unit on a plane and its equipment on a ship, and send them northwest. However, in reality, a unit cannot just pick up and go. The process involves many tasks that must be accomplished through an intricate network of military offices stretching from Haiti to the continental United States (CONUS).

Release Procedures

First a unit needs an official release. Joint Task Force-Haiti (JTF–H) is the organization that the U.S. Southern Command has put in charge of military operations in Haiti. This task force coordinates with the aid organizations to determine when a particular military capability can be decreased or eliminated. Based on this information, JTF–H issues a fragmentary order releasing units with capabilities that are no longer needed.

The DRCC has an orders section that watches for these releases to be issued. The unit can then come to the JLC–H DRCC in the joint operations center to meet with a liaison officer for the Transportation Coordination Automated Information for Movement System II (TC–AIMS II) to begin the redeployment process. [TC–AIMS II is a tool for establishing and tracking movements of military deployment transportation by land, air, and sea.]

The redeploying unit's movement officer must create a unit deployment list (UDL) in TC–AIMS II. The UDL details all personnel and equipment being redeployed. Once the UDL is created, the DRCC's mobility section approves it and forwards it to U.S. Army South, where it is used to establish unit line numbers. The list of unit line numbers is forwarded to the U.S. Southern Command for validation and then sent to the U.S. Transportation Command for allocation of the necessary transportation.

The type of movement used depends on what is being moved and where it is going. For example, most equipment leaves Haiti by ship, but personnel and lighter equipment leave by air. Once back in CONUS, equipment may need ground transport to inland destinations, while personnel will travel by domestic air or bus.

The U.S. Transportation Command will issue an available-to-load date (ALD) for the unit to move and for its equipment to be shipped. These dates are used by the unit and the DRCC to prepare a plan to get the unit ready for movement by the ALD. With the UDL, accuracy is the key to not having something left behind because if something does not have a unit line number, it does not ship.

Ground Transportation

The next step is for unit planners to meet with the ground transportation cell. The redeploying unit, with the aid of the DRCC, will determine its transportation needs, including the number of containers needed for shipping its equipment. How the unit will transport its equipment to the seaport and its people and baggage to the airport is also addressed.

After the devastating earthquake in Haiti in January 2010, the United States sent military units to provide assistance. As units were replaced by civilian organizations, the 377th Theater Sustainment Command Deployment/Redeployment Coordination Cell arranged for the transport of the military members and their equipment.

Empty containers must then be delivered to the unit's location. The unit is responsible for the packing process. The final packing must be done in coordination with customs (the DRCC has embedded customs liaison officers), which will have a representative present to inspect packed items and seal the container once the packing is complete. The unit is now ready to move.

Sea Transportation Preparations

While at the DRCC, the unit movement officer also coordinates with the washrack operations cell. Once the amount of time needed to complete the packing process is determined, a schedule can be set for getting the unit's equipment to the seaport, where it will go through washrack procedures to clean it before it is returned to CONUS. Seven to 10 days before the unit's departure date, ground transportation will arrange for the movement of the equipment to the seaport and arrange for the materials-handling equipment needed to download it.

Once the equipment is clean and cleared by customs, it will be secured in the holding yard. The DRCC's sea mobility cell tracks inbound and outbound ships. This cell will arrange for the transport of the unit's equipment by ship. When the ship arrives in Haiti (2 to 4 days before the ALD), the DRCC will issue a "call forward" message for the equipment, which will then be brought from the holding area and loaded on the ship.

Air Transportation Preparations

Two days before the ALD, the ground transportation cell ensures that buses and cargo trucks are available for the unit's personnel and personal equipment. Twenty-four hours out, the DRCC issues the call-forward message for the unit personnel and arranges for customs to inspect the personal equipment being flown back with the personnel.

The air mobility cell tracks inbound and outbound airplanes and identifies the aircraft on which the unit will depart. Nine hours out, the ground transportation cell sends the buses and cargo trucks to pick up the unit and get it to the airport no later than 6 hours before the flight. The unit will have a manifest of personnel and gear flying and a certification of the customs check.

The DRCC has an airport liaison officer who ensures that the airplane arrives, the unit boards, and the airplane departs. When it receives the airport liaison officer's report that the plane has taken off, the DRCC will issue a wheels-up report though the JLC–H J–3 to JTF–H. The DRCC will track the airplane and issue a wheels-down report after receiving confirmation that the plane has landed.

This may seem like a relatively simple process. When you consider that many of these tasks are taking place simultaneously, that multiple variables affect sea and air travel (the biggest being weather), and that several units are exiting during the same time period, it is apparent the DRCC must go the extra mile to ensure that servicemembers in Haiti are returned home safely.

Lieutenant Colonel Michael J. Perez is the public affairs officer for the 377th Theater Sustainment Command. He holds a bachelor's degree in business administration from Loyola University of New Orleans and is a graduate of the Signal Officer Basic Course, the Quartermaster Officer Advanced Course, the Combined Arms and Services Staff School, and the Intermediate Level Education Course.

Sustainment SRM: Why the Army Is Uniquely Positioned to Benefit

BY JAMES D. MCINTOSH AND JONATHAN SELTER

In early 2002, a major insurance company that we will call "Acme" faced a challenge common to many large enterprises. Although the insurance giant procured over $13 billion worth of goods and services from many vendors, it managed supplier relationships through disparate organizations scattered across the company. Moreover, various business units, often with competing or conflicting interests, each managed different pieces of the relationship with a single major supplier. To improve procurement activities throughout the organization, Acme initiated an ambitious supplier relationship management (SRM) program.

Acme began with a pilot program involving 10 suppliers to demonstrate proof of concept. After analyzing the 10 initial candidates, Acme selected the 3 most strategically valuable vendors. The results were quickly visible. Acme began to see improved performance resulting from the use of agreed-upon performance metrics. It developed a deeper understanding of the internal operations of each supplier in the pilot program, and its supplier relationships became more productive with substantially improved and more honest communication channels.

Acme's experience is not unique. Large companies from a wide variety of industries are increasingly recognizing the benefits of SRM, but commercial organizations are not the only potential beneficiaries. Weapon system sustainment is a prime candidate for SRM. The Army alone procures nearly $6 billion of class IX (repair parts) annually, but its supplier relationships are managed by a variety of project management offices (PMOs), program management offices, and product management offices that generally do not coordinate their procurement activities.

Furthermore, the complexity of weapon system parts means that most sustainment suppliers are strategically valuable to the Army. As such, they are worth incorporating into a well-designed SRM program. Just like Acme and other enterprises, the Army sustainment community can benefit by approaching its supplier relationships more strategically through an enterprise-wide SRM program.

Choosing SRM

SRM programs offer three primary benefits: improved supplier performance, risk assessment and mitigation tools, and more valuable supplier relationships facilitated by open exchanges of information.

The Army sustainment community has already made efforts to address supplier performance issues and to regularly assess supplier performance, but risk analysis and relationship value have not received the same attention. As a result, supplier management has focused more on the past than on gaining insight into future supply chain performance. By emphasizing risk mitigation and relationship value, the Army can predict future supply chain challenges and take corrective action before problems escalate.

Improved supplier performance. Supplier performance is crucial to the health of any complex supply chain, including weapon system supply chains. Supplier performance has several dimensions, including cost, delivery timeliness, and incoming item quality, among others. Different stakeholders within an organization typically have different needs and will accordingly value the various performance dimensions differently.

In the Army, for example, the Aviation and Missile Command (AMCOM) and the TACOM Life Cycle Management Command (LCMC) share several suppliers. Suppose, however, that AMCOM is primarily concerned with cost while TACOM values delivery timeliness. A well-crafted sustainment SRM program will select performance metrics carefully and collaboratively. The program can therefore mediate among the competing demands of AMCOM and TACOM stakeholders and ensure that the correct dimensions of supplier performance are emphasized and addressed.

Risk assessment and mitigation tools. Interruptions in the supply of crucial items can pose serious challenges for large enterprises and for the Army's sustainment supply chain. However, despite the importance of an uninterrupted weapon system sustainment supply chain, the risk profile of weapon system suppliers is often overlooked.

Two risks are particularly problematic: the risk of a critical supplier becoming insolvent and the risk of a disruption in the supply of essential items. An SRM program would fill the gap by supplementing assessments of past performance with forward-looking risk profiles that can help the sustainment community anticipate future supply-chain problems involving both types of risk.

More valuable supplier relationships. Large enterprises and suppliers often have closed relationships in which little information is shared and collaboration is rare. Such closed relationships provide limited value to both the customer and the supplier.

For example, suppose that Honeywell International, the manufacturer of several UH–60 Black Hawk helicopter repair parts and a critical sustainment supplier, faced difficul-

ties with one of its own first-tier suppliers. With a typical closed relationship, the Army would not know about the potential supply chain disruptions that could cascade from Honeywell's own upstream supply chain. Moreover, the Army would be unable to help Honeywell deal with a problematic supplier.

With an SRM program, on the other hand, the Army and Honeywell would have a collaborative relationship with more information sharing. Through SRM, the Army would gain insight into a supplier's own supply chain and could begin to pursue solutions to shared supply chain problems.

Doing the Homework

An SRM program is a strategic approach to managing suppliers, and enterprises must do their homework before launching into outreach. Their task is to create a detailed portrait of customer-supplier relationships by thoroughly analyzing both quantitative data (such as internal spending data) and qualitative data (such as internal or external interviews). To pursue SRM, organizations need to group suppliers according to their strategic importance and identify each stakeholder that has an interest in each supplier relationship.

Segmenting suppliers. Which suppliers will be included in the SRM program, and how should we approach them?

In Acme's case, it analyzed 10 suppliers but pursued SRM with only the 3 that were strategically important to its supply chain. While organizations can use various approaches to segment suppliers, Acme evaluated its own planning horizon for the items provided by each supplier, existing spending volume, product influence within the supply market, and the existing health of the customer-supplier relationship, among many other factors. The end product of segmentation should be a grouping of suppliers along a continuum from least strategically important to most strategically important. These segments will help indicate the appropriate form of outreach (if any).

In excluding 70 percent of the initial candidates for SRM, Acme mirrored the experience of most large organizations whose vendor base is dominated by suppliers with relatively low strategic value. The weapon system sustainment supply chain, however, is different. Because of the typical characteristics of weapon system items, such as extreme technical complexity, long procurement leadtimes, and high unit costs, sustainment suppliers have more strategic value. Indeed, supplier segmentation will probably show that most sustainment suppliers can be included in an SRM program.

Identifying and profiling stakeholders. Which internal stakeholders should have the greatest influence?

As previously noted, an SRM program can help reconcile competing demands within a customer organization. It is not uncommon for different business units within an enterprise to have differing performance needs or unequal risk thresholds, but without first identifying these stakeholders and determining their relative importance to the customer-supplier relationship, the enterprise will be unable to mediate among the different business units.

Several pieces of information make up a stakeholder profile, including internal spending data, the strategic value of the stakeholder's business unit to the enterprise's supply chain, and the business unit's position within the organization's corporate structure.

All other things being equal, stakeholders that account for more spending, that are more central to the enterprise's core business, and that are more senior in the organization's hierarchy should be given more of a voice in an SRM program. The business unit that is most important to a customer-supplier relationship should be given ultimate responsibility for owning and managing that supplier relationship. Even so, all interested stakeholders should participate so that the SRM program is truly representative of the full breadth of interests within the enterprise.

In an Army sustainment context, it is unlikely that a stakeholder's importance to the supply chain will vary significantly. As a result, weapon system stakeholder profiles will be primarily guided by spending and position in the Army enterprise.

A sustainment supplier relationship can be managed at the item, weapon-system, platform, cross-platform, LCMC, or Army Materiel Command (AMC) level. Currently, weapon-system supplier relationships tend to be managed at the item or weapon-system level, but there are benefits to managing a supplier relationship at a higher level within AMC.

When dealing with suppliers that provide items across multiple weapon systems, the Army can increase its leverage by aggregating each weapon system's spending into a single requirement and a single supplier negotiation. Nevertheless, managing a supplier relationship at a higher organizational level is not always warranted. By profiling stakeholders through an SRM program, the Army can balance the benefits of elevating the management of a supplier relationship with the realities of each supplier's spending profile.

Managing Supplier Relationships

Suppose, for example, that AMC has a set of suppliers with spending breakdowns resembling those in the table on page 16. Even though each supplier does $500 million worth of business with AMC, their spending breakdown across the different levels of the AMC enterprise implies a different relationship owner for each supplier.

The combined spending of Supplier 1 and Supplier 2 is concentrated within AMCOM and, more specifically, within Program Executive Office (PEO) Aviation. On the other hand, Supplier 1's spending is exclusively related to the Black Hawk helicopter, and Supplier 2's spending is spread across the Black Hawk and Apache platforms.

The Army can leverage Supplier 1's spending base by managing its relationship at the platform level. Ownership of the Supplier 2 relationship should be elevated to the PEO (cross-platform) level.

Supplier 3's spending is concentrated within a single LCMC. Because it is divided between PEO Ground Combat Systems and PEO Soldier, the Supplier 3 relationship should be managed at the LCMC level. Supplier 4's spending is shared between AMCOM and TACOM, and the Supplier 4 relationship should be managed at the AMC level.

Regardless of who owns the relationship, however, all stakeholders with an interest in the relationship should participate in the SRM program. Even in the extreme case of

	Supplier 1	Supplier 2	Supplier 3	Supplier 4
AMC	$500	$500	$500	$500
AMCOM	$500	$500	$ 0	$300
PEO Aviation	$500	$500	$ 0	$300
PMO Utility Helicopter (Black Hawk)	$500	$300	$ 0	$300
PMO Apache Helicopter	$ 0	$200	$ 0	$ 0
TACOM LCMC	$ 0	$ 0	$500	$200
PEO Ground Combat Systems	$ 0	$ 0	$300	$200
PMO Heavy Brigade Combat Team	$ 0	$ 0	$300	$200
PMO Stryker Bridge Combat Team	$ 0	$ 0	$ 0	$ 0
PEO Soldier	$ 0	$ 0	$200	$ 0
PMO Soldier Weapons	$ 0	$ 0	$200	$ 0
PMO Soldier Warrior	$ 0	$ 0	$ 0	$ 0

Legend

AMC = Army Materiel Command
AMCOM = Aviation and Missile Command
LCMC = Life Cycle Management Command
PEO = Program Executive Office
PMO = Project Management Office

This table shows the dollars (in millions) spent by the various suppliers in the scenario. Although each supplier's total spending with the Army Materiel Command is the same, their different spending profiles imply different relationship owners.

Supplier 1, in which all spending accrues to PMO Utility Helicopter, PEO Aviation, AMCOM, and AMC stakeholders should be involved in SRM activities.

Tailoring the SRM Program

When supplier segmentation and stakeholder analysis are complete, an organization can begin to create its SRM program. Unlike SRM preparation, which is a similar process for each enterprise, there is no single formula for supplier outreach. Outreach can be as simple as measuring the performance of a supplier according to a small set of key metrics or as complex as full supply chain integration through a series of partnership contracts. For most suppliers, however, the extent of supplier outreach will lie between these two extremes.

Regardless of the extent of SRM outreach, tailoring it to the needs of an individual supplier relationship is key. The factors that guide the design of outreach include the strategic value of a supplier to the organization, the anticipated duration of the customer-supplier relationship, and the existing health of the customer-supplier relationship.

It would be a waste of resources to partner with a short-term supplier or a supplier that is of little strategic value, and it would be too risky to partner with a supplier whose existing relationship with the organization is unhealthy. Similarly, an enterprise will miss opportunities to capture the full benefits of SRM by pursuing hands-off performance measurement with strategically valuable suppliers, long-term suppliers, or suppliers with an existing healthy relationship.

Within the Army sustainment community, examples exist of both performance measurement and partnership. At the performance measurement extreme, metrics like "procurement lead time" or "acquisition lead time" are often included in contracts. At the partnership extreme, the Army has entered into partnerships with crucial weapon system suppliers, including GE, Sikorsky, and Lockheed Martin. Partnerships, however, generally cover a single part or weapon system and do not resemble the more complex, enterprise-wide partnerships envisioned by SRM programs.

Similarly, performance measurement typically occurs at the contract or item level and does not provide an enterprise-wide picture of supplier performance. Moreover, for most weapon system suppliers, performance measurement is an inappropriate form of supplier outreach. As noted above, the sustainment supply chain differs from those of private industry in that it consists primarily of long-term suppliers with strategic value to the Army. In an Army sustainment context, SRM outreach will skew toward more complex, collaborative programs aimed at joint supply chain improvements.

SRM programs are an increasingly recognized best practice among private industry. As the Army continues to evolve and improve its sustainment supply chain, it should incorporate SRM in order to improve management, assess and mitigate risk, and increase the value of its supplier relationships.

The Army's sustainment supply chain is dominated by strategically valuable, long-term suppliers that provide complex items with long leadtimes. The Army will consequently gain more from SRM than will private industry, and it is in a unique position to implement a highly effective sustainment SRM program.

More broadly, the principles of SRM apply equally to all Department of Defense services. As the services explore joint sourcing of sustainment items, SRM can be a valuable tool for reconciling their potentially competing demands.

James D. McIntosh is a director at Censeo Consulting Group. He holds a B.S. degree in computer science from Harvard University and an M.B.A. degree from the Massachusetts Institute of Technology.

Jonathan Selter is an associate at Censeo Consulting Group. He has a bachelor's degree from Wesleyan University and a master's degree from Harvard University.

Testing the Capabilities of the HEMTT Wrecker

BY FIRST LIEUTENANT JEFFREY TEPLIS

An FSC in Iraq tested the capabilities of its wreckers through a variety of heavy-duty missions.

As the maintenance platoon leader in a forward support company (FSC), I am responsible for personnel management, paperwork, and mission planning. In one mission, the FSC assisted in closing a joint security station manned by U.S. Soldiers and the Iraqi Police. Before this operation, the FSC's Soldiers knew their equipment's basic capabilities. However, after the operation, my FSC knew the limitations and full capabilities of its systems.

Finding the Weight Limit

The most valuable tool used throughout the entire operation was the FSCs M984 wrecker-recovery heavy expanded-mobility tactical trucks (HEMTTs). Before this mission, the FSC consulted the M984 technical manual for information on the lift capabilities of the wrecker's crane. The operators found that the crane's lift capability was adequate for the mission that the FSC would be attempting to perform. Although lift capacity information is considered common knowledge, operators and supervisors regularly check the technical manual for a vehicle's weight lifting limit. As long as a plan can be made on how to lift an object and the object weighs less than the weight limit, the object can be safely lifted.

The First Test: The Weight Limit

During the operation to close the joint security station, the cranes were pushed to the limit. Our first mission was to lower and remove an 85-foot-tall rapid aerostat initial deployment tower. This tower had been damaged while it was being lowered when a support cable became stuck, bending the tower in such a way that it could no longer lower into itself.

The maintenance platoon's service and recovery noncommissioned officer-in-charge and I developed a plan for safely lowering and dismantling the tower. This plan consisted of backing a wrecker up to the base of the tower to support the tower's weight as it was lowered. Then the hydraulics that normally lay the tower down on its trailer were used to lower the tower while a second wrecker assisted in the operation. This second wrecker raised its boom out to its full length, and then a Soldier took the cable from it, climbed 60 feet up the tower, and attached the cable to the tower. The wrecker and hydraulics then lowered the tower down with no damage to vehicles, personnel, or the tower.

The Second Test: Moving MILVANs

During a second "drawdown," two wreckers were taken out to the joint security station and used to move 20-foot MILVANs [military-owned demountable containers]. Four of these large containers, which were almost as long as tractor-trailer containers, needed to be lifted and placed on flatracks for transport. To accomplish this, the wreckers backed up to opposite sides of a MILVAN and attached their cables to the top. Then they lifted the MILVAN while a palletized load system (PLS) pushed the flatrack underneath it. This was very impressive, as each MILVAN weighed more than 6,000 pounds. Once the MILVANs were in place on the flatracks, the wreckers were used to move several smaller items, such as generators and trailers.

The Final Test: A Tight Squeeze

The FSC's final mission required the wreckers to remove a flatrack from underneath a very large civilian generator that was powering a dozen different buildings. The generator weighed about 250,000 pounds and was in a very small area with little maneuver room. The two wreckers backed up to the generator from opposite sides and lifted it, and a PLS truck approached and pulled out the flatrack on which the generator had been sitting. This operation was very demanding and required some ingenuity because the wreckers had objects in their way requiring them to extend their booms and lift the generator from about 15 feet away.

Little recognition is given to service and recovery sections across the Army, but they serve varied and vital roles in FSCs. Without their vast knowledge of their equipment and ingenuity in using it, many missions could not be completed. The M984 HEMTT wrecker is a very capable piece of equipment that, in the hands of the right operators, can accomplish many missions that previously were believed to be impossible. One should never underestimate what these vehicles can do. As leaders, knowing the vehicles full capabilities and using them to their safest maximum potential is essential.

FIRST LIEUTENANT JEFFREY TEPLIS WAS THE MAINTENANCE PLATOON LEADER OF G COMPANY, A FORWARD SUPPORT COMPANY OF THE 26TH BRIGADE SUPPORT BATTALION, 2D HEAVY BRIGADE COMBAT TEAM, 3D INFANTRY DIVISION, DURING ITS RECENT DEPLOYMENT TO IRAQ. HE HOLDS A BACHELOR'S DEGREE IN SOCIAL SCIENCE WITH MINORS IN POLITICAL SCIENCE AND MILITARY LEADERSHIP FROM NORTH GEORGIA COLLEGE AND STATE UNIVERSITY, AND HE IS A GRADUATE OF THE ORDNANCE OFFICER BASIC COURSE.

Terrain Analysis for Non-Engineers

BY MAJOR DAMIAN A. GREEN

Knowledge of the terrain of an upcoming operation is critical to planning. The author suggests several websites and agencies that can help sustainers to gain this knowledge.

You receive a call from your commander saying, "Staff, mission analysis in 30 minutes—we just received an out-of-sector mission." Over the course of the next couple of hours or days, you work to understand the new area of operations for which you had not planned. You have no knowledge of the terrain and no maps of the area, so you look on the Internet for any information that can help your organization better prepare for this new mission. Does this sound familiar?

Doctrinally, the Army Corps of Engineers should assist you in conducting terrain analysis for future missions. Field Manual 3–34.170, Engineer Reconnaissance, reinforces the fact that geospatial engineering is an engineer capability in addition to combat (mobility, countermobility, and survivability) and general engineering skills.

Learning About Terrain Analysis

Maneuver brigade combat teams have a topographical section that can provide this analysis with the same data that are available to the rest of the Army if you know who to ask and what to ask for. Having proactive, technically inclined individuals on the battalion staff enables you to gather the information you want on your own schedule and make the necessary changes—all without going outside of your unit. A number of sources, both unclassified and classified, can provide you with the information you need to request access to some websites and to request training for your own unit.

Until you can get a training team on site to increase your level of competency, you can visit the following five Non-Secure Internet Protocol Router Network (NIPRNET) websites for terrain analysis assistance:

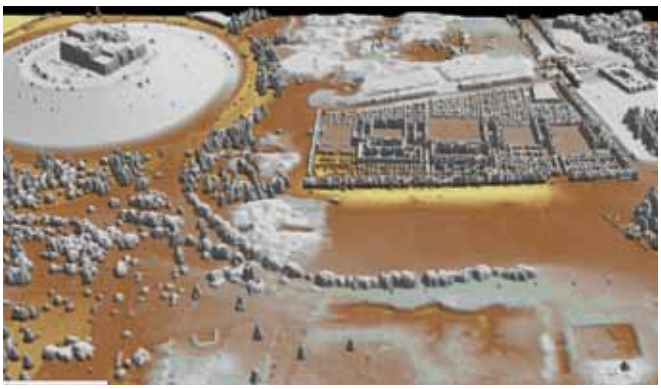
- https://www.extranet.nga.mil
- https://warp.nga.mil
- https://www1.nga.mil
- http://www.agc.army.mil
- http://www.intelink.gov

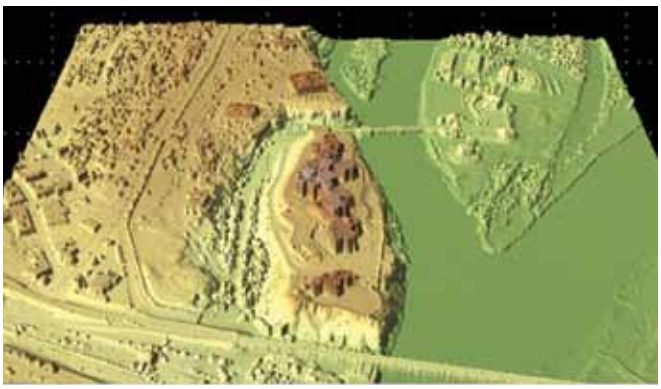
You will need to request access to these websites and have a common access card reader to gain the full benefits.

National Geospatial-Intelligence Agency

The National Geospatial-Intelligence Agency (NGA) is a Department of Defense agency that develops imagery and provides timely map-based intelligence solutions for U.S. national defense, homeland security, and navigation safety. NGA provides deployable teams throughout the world to support the warfighter. If you do not know where to find NGA, ask your division or corps engineer cell or check at one of the larger forward operating bases in your area of operations.

You should request a mobile training team from NGA's Geospatial Analysis Branch (gist@nga.mil). The team





At left, this elevation shaded-relief 3-dimensional perspective of Babylon, Iraq, was made using the Buckeye Program, which consists of an airborne platform that collects unclassified high-resolution geospatial data for tactical missions. At right is an elevation shaded-relief map providing a 3-dimensional perspective of Tikrit, Iraq. Light detection and ranging is used to remotely sense elevation data. *(Images courtesy of the School of Geospacial Intelligence)*

This image of the Urban Tactical Planner shows the level of detail that can be obtained through this site.

will bring up to 15 laptop computers and a projector, if needed. The requestor only has to provide the students, Internet drops, and a classroom. The team provides training on both the Secret Internet Protocol Router Network and NIPRNET and can tailor instruction to the needs of the customer.

One product that I found useful was Falconview. Originally designed for aviators to plan their routes, it can be a great tool for ground units. Recently, NGA created a variation of Falconview called Talonview, which is for nonaviators. Using the above websites, you can determine the map data that you need, and NGA will send you the electronic files (in 2 days to 2 weeks). If the request requires more than a couple of gigabytes of memory, you will receive as many firewire terabit hard drives as are required to store the information—all at no cost to the unit.

Another tool that NGA can provide is a 3-dimensional map (20 inches by 24 inches by 16 inches) of any location in the world. This durable, solid model visually portrays digital geospatial information that can be used in various functions. If your routes travel over the same roads, the map could be your terrain model for convoy briefings. All you have to provide are a couple of scale models of your vehicles. This map also can be used for course-of-action development, wargaming, and terrain visualization.

Army Geospatial Center

The Army Geospatial Center (AGC), run by the Army Corps of Engineers, provides an extremely user-friendly site for products and services that enable the average Soldier to become a more knowledgeable planner. The AGC develops and fields geospatial enterprise-enabled systems and capabilities across the Army and the Department of Defense.

The Urban Tactical Planner (UTP) provides an incredible unclassified capability for the warfighter to better visualize his environment. UTP taps into NGA's topographic products and other data sources to show the urban environment, such as building heights, vertical obstructions, bridges, lines of communication, key cultural features, and landmarks. Designed by AGC in partnership with General Dynamics, UTP is a great planning tool that can be accessed down to the squad level.

Intelink—Unclassified

You have probably used Wikipedia to gather information on the Internet. Intelink, which was started in 1994 to promote intelligence dissemination, is nothing more than Wikipedia on a secured Internet site. With Intelink, you type your request into the search engine and you will get hits from various sources. Some of the Wikipedia information is present in the database (vetted, of course).

Having a "passport" allows the user to become a contributor and post documents and products to the site. The accuracy of the information is a matter of opinion, but most contributors are going to post only their best products. The site appears to be self-policing.

In this article, I have mentioned various websites that can be accessed in order to improve operational planning. If you are not hands on and electronically focused, provide this article to your G/S–3, G–5, support operations office, and engineer cell so they can provide you with a better quality product.

Major Damian A. Green is a student at the Army's School of Advanced Military Studies. He holds a bachelor's degree in science from Providence College and a master's degree in business from the University of Kansas. He attended the Infantry Officer Basic Course, Ordnance Transition Course, Combined Logistics Captains Career Course, and Intermediate Level Education at the Army Command and General Staff College.

Army Soldier Enhancement Program

BY THOMAS B. HOUSE II AND RAYMOND E. STRUNK

The Army's Soldier Enhancement Program evaluates commercially available items that meet Soldiers' needs.

For more than 20 years, the Army's Soldier Enhancement Program (SEP) has been providing Soldiers with commercial off-the-shelf (COTS) items that help them effectively complete their missions. And yet many people have never heard of SEP.

SEP's past successes include the M110 semi-automatic sniper system, clip-on sniper night sight, aviation laser pointer, parachute electronic activation device, fuel handlers coveralls and gloves, modular ghillie suit and ghillie suit accessory kit upgrade, AN/PEQ–4 integrated laser white light pointer, parachutists drop bag, improved combat shelter, and tactical assault ladder.

SEP was established by Congress in 1989 to purchase items that improve lethality, survivability, command and control, mobility, and sustainability for all Soldiers. SEP pioneered acquisition reform and was a forerunner of the Program Executive Office (PEO) Soldier Rapid Fielding Initiative, which also delivers state-of-the art technology and gear to Soldiers on fast-track schedules. Today, PEO Soldier, along with the Army Training and Doctrine Command, manages SEP for the Army. What is great about SEP is that anyone can submit a proposal for a new item and SEP can provide that capability for our Soldiers in less than 3 years.

Enhance What Is Already Available

Unlike many military acquisition programs, SEP relies on commercially available technologies that are adapted to meet Soldiers' specific requirements. Ideas for the program come from Soldiers, commanders, units with specific needs, and industry leaders worldwide. The range of items includes individual weapons, ammunition, optics, combat clothing, individual equipment, water supplies, shelters, and navigational aids. The COTS starting point must lend itself to being adapted and provided to Soldiers in no more than 3 years.

Sustainment Soldiers' Requirements

Maneuver Soldiers rely on equipment they wear or carry. Sustainment and support Soldiers frequently receive clothing and equipment that was developed for the maneuver community.

Fuel handler coveralls (FHC) and gloves, however, are prime examples of SEP capability enhancements that benefit those working in the logistics realm. The FHC and gloves programs were initiated as SEP programs in 2004 to develop a protective ensemble that meets industrial standards for repelling fuel and dissipating static. FHC provide excellent liquid resistance not found in other military-issue coveralls.

The Army recently modified the Common Table of Allowance 50–900 to authorize watercraft operators to draw and maintain FHC, and the Program Manager for Clothing and Individual Equipment recently published a sources-sought notice for fire-resistant FHC. When a candidate is selected and fielded, logistics Soldiers will have a tailored option available to protect them from flame as well as fuel, lubricants, solvents, and other toxic industrial chemicals and materials. The Sustainment Center of Excellence has proposed SEP support for flotation armor to address combined protection and survival deficiencies for sustainment and support Soldiers who routinely operate around littoral waters or engage in water-crossing operations. However, no other SEP candidates specifically intended for sustainment Soldiers have been approved since the FHC.

> WITH THE ARMY IMMERSED IN CONFLICTS AROUND THE WORLD, SOLDIERS NEED EQUIPMENT THAT REFLECTS THE BEST TECHNOLOGY, AND THEY NEED IT FAST.

Identifying Sustainment Soldiers' Needs

Do sustainment Soldiers perform specific tasks or encounter specific hazards that the SEP program can address? The Army is now augmenting units in Afghanistan with "plate carriers" and accepting body armor protection risk for better mobility during specific missions.

Meanwhile, joint trauma analysis, combat injury prevention, and Department of Defense blast injury

This photo is an example of the Sniper Quick Fire Site, which is a commercial off-the-shelf capability that the Soldier Enhancement Program has approved for solicitation for procurement.

research programs indicate a need for increased maxillofacial and extremity coverage. Theater feedback indicates a need to use the improved outer tactical vest with deltoid and groin protection on convoys to maximize protection. COTS solutions could provide personnel in stationary guard positions or riding in tactical wheeled vehicles with additional protection from shrapnel and spall, but the Army considers them too encumbering to be useful. Are we ignoring typical sustainment Soldier tasks for which personal mobility is not imperative?

Rifleman's Radio and Ground Soldier Increment 1 are emerging command and control systems that provide position-location capability for the individual Soldier. These systems will certainly mature and increase in number to aid tactical maneuver, but are they the best fit for sustainment units? Sustainment formations tend to rely heavily on communications systems in organic vehicles for command and control. What about expanding in-transit visibility or Standard Army Management Information Systems to encompass individual Soldier status? Can radio frequency identification technology provide a cheaper alternative for sustainment formation leaders to track teams or individual Soldiers in the vicinity of convoys and operating bases?

The requirement for a new piece of equipment for sustainment Soldiers could be as simple as an individual handtool or a Bluetooth hand-held electronic organizer that is capable of passing logistics data. PEO Soldier Systems Integration, in coordination with the Army Training and Doctrine Command Capability Manager-Soldier, reviews submissions and decides whether to evaluate an item further, buy or produce it, conduct field testing, or standardize and issue it to Soldiers in the field. The SEP executive council meets each February and August to approve initiatives for the next fiscal year.

SEP Now

With the Army immersed in conflicts around the world, Soldiers need equipment that reflects the best technology, and they need it fast. Before transformation was a part of the Army lexicon, SEP was promoting transformation of the Soldier system with an accelerated acquisition process that gets better weapons and gear into Soldiers' hands. SEP continues to play a key role in the effort to meet Soldiers' requirements. Current programs include the aircrew laser pointer, advanced sniper accessory kit, grenadier laser range finder, XM–1116 12-gauge extended-range nonlethal cartridge, sniper quick fire sight, and sniper weapon tripod.

Anyone can submit a proposal. Nearly 100 proposals are received and reviewed every 6 months. PEO Soldier will consider proposals for items that—

- ❏ Currently are available as COTS.
- ❏ Will enhance the effectiveness of individual Soldiers in a tactical environment.
- ❏ Can be worn, carried, or consumed by Soldiers in a tactical environment.

Proposals can be submitted on line at www.peosoldier.army.mil, by fax to (706) 545–1377, by email to thomas.house@us.army.mil, or by mail to Tom House, 7010 Morrison Avenue, Building 128, Room 209, Fort Benning, Georgia 31905.

For more information about SEP, the process, or meeting dates, call (706) 545–6047 or send an email to thomas.house@us.army.mil.

Thomas B. House II is the Soldier Enhancement Program Manager for Program Executive Office Soldier at Fort Benning, Georgia. He is a graduate of the Primary, Basic, and Advanced Noncommissioned Officer Courses, the Battle Staff Course, the First Sergeant Course, and the Army Sergeants Major Course.

Raymond E. Strunk, an Engility Corporation contractor, is a Soldier systems representative for the Materiel Systems Directorate of the Sustainment Center of Excellence. He holds a B.S. degree in electronics technology from the University of Central Florida.

A Battalion in Italy Supports Humanitarian Disaster Relief Around the World

BY CAPTAIN MICHAEL KISTLER, USAR, FRED WITTMER, AND JENNIFER KING

An Army pre-positioned stocks unit has a unique additional mission: supporting the U.S. Agency for International Development with supplies for disaster relief operations.

Alberto Chidini knows all too well the surprise of being jarred awake in the middle of the night by a ringing telephone. As the manager of humanitarian assistance logistics operations for the 3d Battalion, 405th Army Field Support Brigade, his schedule can change the moment a natural disaster hits anywhere in the world.

The 3d Battalion is a small Army pre-positioned stocks (APS) unit headquartered at Leghorn Army Depot, Italy, that does more than maintain supplies for the APS mission and execute reset and left-behind-equipment operations. It has a worldwide reach through a unique interagency agreement with the U.S. Agency for International Development (USAID).

"We store and maintain humanitarian supplies for them [USAID], and when an international emergency arises, they contact us directly," explained Lieutenant Colonel Richard Pierce, the battalion's commander. "We pack the materials according to the list that they provide and make sure that the supplies get where they are needed as quickly as possible."

An Advantageous Location

Robert Demeranville, a senior logistician with USAID, noted that USAID operations actually begin long before the call to the battalion. "If something happens, a disaster is declared," he explained. "We send a team in, and once the team is on the ground, they survey the situation and then send a call for commodities based on what is needed in the disaster area. When we get that call from the team on the ground, we call the battalion and get the supplies moving."

The 3d Battalion is singularly qualified to support disaster logistics operations. "Our location in Italy gives us a unique logistics capability," Pierce said. "Because we have access to both water and air transport capabilities within 30 minutes of the depot, we can execute loading and transportation missions quickly and efficiently, ensuring that the aid reaches the disaster area as quickly as possible."

The ability to move materials using a variety of transportation options is a key component to the success of the relationship. "We frequently need quick access to air transportation," Demeranville said. "The multiple logistics capabilities of the battalion make it easy for us to move commodities around out of the base and to the designated airport of departure. If we can't get an airplane to Pisa quickly enough, USAID will contract to have the supplies picked up at our Pisa warehouse and trucked by the battalion to other commercial airport locations in Europe. That sort of flexibility is a great asset for missions such as these."

Support for Over 40 Years

The agreement between USAID and the battalion began in 1973 during a time when the agency stored all of its materials on military installations. "In the past, we largely utilized military installations for our warehousing operations," Demeranville said. "However, that is no longer the case. All of our warehousing operations have been moved to commercial locations, with the exception of the materials at the battalion in Italy. They are the only military unit that handles this sort of work for us now."

Over the decades, the battalion has supported countless missions across the globe. "In the last 10 years alone, we've shipped humanitarian assistance supplies to more than 45 countries at USAID's request," Chidini said.

Responding Fast

The battalion stores and maintains a wide variety of humanitarian assistance supplies for USAID, including water purification systems, blankets, tents, personal hygiene kits, medical kits, and plastic sheeting. This mission is not without its challenges.

Warehouse workers prepare to transport a water buffalo from the 3d Battalion, 405th Army Field Support Brigade, to Pisa International Airport for shipment to Port-au-Prince, Haiti. *(Photo by Chiara Mattirolo)*

"The humanitarian aid mission is always an emergency," explained Maurizio Frascarelli, a general supply specialist who frequently assists with the urgent relief USAID missions. "The most challenging part is to understand the request, match the request to our inventory, and find people to do the job, even if it's in the middle of the night. It is imperative that we load the trucks to send the materials in the shortest timeframe possible."

Demeranville commented that the Italian customs laws are extremely strict, but the battalion easily overcomes the challenges presented by the nation's regulations. "Despite the detailed procedures for Italian customs, they do a great job," he said. "They have a very strong relationship with local customs officials. That's what makes this agreement so successful—that, and the care and dedication to operations from the crew. You can tell that they take the job very seriously. The battalion knows everything that is required to make operations work at the pace that we need to execute. We reposition lots of cargo in and out of Leghorn Army Depot, and the team there is timely and talented."

A Rewarding Mission

Of all the missions that the battalion executes, the USAID mission is near and dear to the hearts of the employees. "We consider ourselves a partner to USAID in their humanitarian relief efforts," Pierce said. "We take great pride in being able to deliver the materials they need in a speedy and efficient manner, doing our part to alleviate the suffering of people as quickly as possible."

Frascarelli agrees that helping people in need galvanizes the effort. "Often before the call comes in from USAID, we have seen the dramatic images of some catastrophic event on the television, and this makes us extremely motivated."

One of the battalion's most recent efforts on behalf of USAID supported relief operations in Haiti, where a devastating 7.0 earthquake decimated much of the country in January 2010. Over 3 months, the battalion sent thousands of pounds of humanitarian supplies to Haiti in 5 different shipments, including four 10,000-liter water bladders, 8 water purification units, more than 58,000 10-liter water containers, more than 30,000 personal hygiene kits, and more than 6,500 rolls of plastic sheeting.

The battalion's ability to execute missions rapidly makes its relationship with USAID ideal. USAID frequently needs materials moved on very short notice, and the battalion is well-equipped to quickly answer those requests. "USAID does a great job of keeping our warehouses stocked with emergency relief supplies," Chidini explained. "They always make sure that we have everything we need to support them in their requests."

At right, the lead warehouse worker for the 3d Battalion, 405th Army Field Support Brigade, uses a forklift to transport humanitarian aid supplies from the battalion's warehouse to a truck for transit to the Pisa Military Airport. *(Photo by Alberto Chidini)*

At bottom right, two warehouse workers unload humanitarian aid supplies from a forklift and palletize the items for transport at the 3d Battalion, 405th Army Field Support Brigade, at Leghorn Army Depot, Italy. *(Photo by Alberto Chidini)*

Lieutenant Colonel Pierce also credits his staff for the success the battalion enjoys with the USAID missions. "We have a tremendously talented workforce," he said. "Our host nation employees are incredibly efficient and extremely experienced in these operations, and their ability to perform with such short notice is an invaluable asset to our organization. Their dedication to our mission is a primary reason for our success."

The agreement between the battalion and USAID is viewed by both parties as a win-win situation. "We take a great deal of pride in our work for USAID," Pierce explained. "This is a mission that helps alleviate the suffering of people throughout the world, and we are humbled that we get to have the opportunity to assist in those efforts."

USAID plans to continue the relationship with the battalion for the foreseeable future. "The battalion is a great asset for us, and they do an excellent job of keeping cargo clean and ready to deploy," Demeranville said. "We have a fantastic relationship with the battalion, and we couldn't be happier with the work they do for us."

Captain Michael Kistler, USAR, is program manager for left-behind equipment South of the Alps at Livorno, Italy. He holds two B.A. degrees from the University of Pittsburgh and an M.A. degree from Indiana University of Pennsylvania and is pursuing a doctorate in administration and leadership studies from Indiana University of Pennsylvania. He is a graduate of the Army Captains Career Course, Medical Services Corps.

Fred Wittmer is the director of supply for the 3d Battalion, 405th Army Field Support Brigade, in Kaiserslautern, Germany. He is a graduate of Louisiana State University and served 21 years in the Army as a quartermaster officer. He has completed the Organizational Leadership for Executives course.

Jennifer King is the public affairs officer for the 405th Army Field Support Brigade in Kaiserslautern, Germany. She holds a B.A. degree in journalism/public relations from the University of Louisiana at Monroe. In her current assignment, she manages Army Materiel Command public affairs activities within the European theater of operations.

Medical Logistics at the Salang Pass Avalanche

BY CAPTAIN JERRY D. VANVACTOR, CAPTAIN JASON DONOVANT, USAF, AND FIRST LIEUTENANT MICHAEL DINH-TRUONG, USAR

Medical logistics personnel responded quickly to an avalanche that occurred in Afghanistan last winter and used their lessons learned to create plans for responding to future disasters.

The ninth day of February 2010 began like any other day at Bagram Airfield, Afghanistan, but initial reports of an incident came filtering into the joint operations center (JOC) around 0900. An avalanche had occurred in the Salang Pass (just north of Kabul), and around 30 people were either injured or in need of assistance. U.S. Air Force parajumpers had already been dispatched and were in the area helping.

Around 1100, calls were received in various tactical operations centers (TOCs) indicating additional people were affected by the avalanche and a larger response would likely be required. With each subsequent report, the situation only grew worse and more agencies began to receive requests for assistance. Around 1230, the JOC notified multiple agencies that a 5-kilometer wide avalanche had carved a swath through the Salang Pass, injuring hundreds, potentially trapping thousands, and killing an estimated 165 (this was not known definitively until after the event).

The U.S. military had helicopters in the area and was evacuating people with an unknown array of injuries to Bagram. Medical personnel from multiple branches of service and civilian agencies were preparing to triage and treat victims. Immediately, medical response personnel began rallying crisis response teams into what had just become an unexpected natural disaster relief effort.

The base's hospital, under the leadership of the supporting headquarters, announced a mass casualty (MASCAL) incident, and decisions were made to employ the base's airport terminal as the central patient triage point for the disaster evacuees. Military police assistance was requested, and much to the chagrin of travelers awaiting flights, the airport was closed to personnel transiting the theater of operations. Those people flying to other locations were asked to wait outside the terminal for their flights or were asked to move into the USO [United Service Organizations] building, where they would be notified of boarding times and flight departure information. A critical incident response was underway, and the 30th Medical Command (MEDCOM) and the 484th Medical Logistics (MEDLOG) Company at Bagram Airfield were among the many agencies that responded. Immediately, the Soldiers went to work in support of the disaster.

Disaster Management: An Overview

Disaster management ordinarily occurs in four phases: preparedness, response, recovery, and mitigation. Current practice favors an all-hazards approach, and literature indicates that first-response agencies should develop response plans for multiple scenarios. Combat units in Afghanistan normally prepare only for battlefield scenarios. Preconfigured medical "push packs" involve surgical and trauma-related equipment. Natural disasters are not among the common missions for a MEDLOG company supporting a theater of operations.

Bagram Airfield, like most other larger military installations, has a MASCAL response plan in place. The plan is exercised at least once per quarter, but with the attitude that this will never happen to us. The base employs a working group of medical professionals who assist in developing the right strategy for providing for the needs of a populace under duress.

Before this real-world event, the MASCAL working group had conducted two training exercises involving the various task forces stationed on the installation that have responsibility for casualty collection points. The scenarios involved coalition medical teams caring for coalition forces within the confines of the base; no one could have predicted a MASCAL of the avalanche's magnitude that required injured Afghan people to be brought through the base's gates.

Although medical support was only a portion of the larger response effort, healthcare practitioners were the defining factor in ensuring that victims received, at a minimum, an initial screening and evaluation when they arrived at Bagram. Please note that the efforts at Bagram were only a portion of the overall response;

A medical Soldier wraps the feet of a child evacuated from the February 2010 Salang Pass avalanche in Afghanistan. The medical logistics company received many requests for pediatric medical supplies, which it normally does not stock, to care for children injured during the avalanche.

the Bagram healthcare teams were the first receivers in support of the first responders at the actual scene of the disaster.

MEDLOG Response

The 484th MEDLOG Company was first notified of the incident around 1330 by the MEDCOM G–4. Directives from MEDCOM included having trauma supplies ready for an impending MASCAL. Blankets and warming packs also were recommended. Because of the large number of victims expected, it was critical to have a MEDLOG company representative stationed at the terminal with a means of contacting the warehouse for additional supplies as they were required.

Logistics leaders at the critical incident site began communicating with clinicians to determine what supplies were needed to treat the types of injuries being seen. As a result of this ongoing communication, items such as warming blankets, various types of fluids, hand-warming packs, intravenous therapy items, hypothermia kits, and bandaging materials were requested from the warehouse. MEDLOG trucks began moving to and from the flight line bringing all available items as quickly as they could be loaded and dropped off.

Both Soldiers and leaders observed several issues of concern that affected the MEDLOG company's support of the disaster relief efforts. Potential shortfalls in continued operations were reported immediately to the incident commander, and he assisted in on-the-spot corrections.

After the avalanche response, Soldiers and leaders discussed what happened, what went well during the event, what did not go very well, and what could be done to improve operations in future situations. The resulting information was passed to multiple higher headquarters for inclusion in a macro-level after-action review for theater commanders to use in planning for future community-wide responses.

What Went Well

The response time from the initial notification to the arrival of the first load of supplies was noted as a tremendous success. What was not known, and was later discussed by noncommissioned officer (NCO) leaders throughout the company, was that the 484th MEDLOG had rehearsed a MASCAL response during training at Fort Hood, Texas, before deployment. NCO leaders recalled how unsuccessful the Soldiers were in training; yet when the "real deal" occurred, the Soldiers responded as if they had always been responding to disasters. The Soldiers formed themselves into self-directed teams (such as data entry, puller and picker, load, and communications teams) and apparently began instinctively managing various aspects of support and sustainment for providers at the triage site.

By having some preconfigured trauma and surgical push packs, the 484th MEDLOG was able to push many of the supplies to the point of need before true demands were established. The trauma packs were already filled with necessary items that clinicians were asking for, so they did not have to initiate requisitions for critical items. Trauma packs were already packed in a tri-wall container, so the 484th MEDLOG was able to place the container in the back of a truck and send supplies to the triage site without asking which items were actually needed. Workers at the site set up a supply point operation and requested that the warehouse send items needed in addition to what was already in the boxes.

Approximately 20 line items were used consistently throughout the incident, and over 2,000 individual items were distributed during the disaster response. As a result of simplified record-keeping initiatives on site, the Soldier responsible for maintaining accountability began developing a cold-weather injury push pack based on volumes of use and for the express purpose of being ready should this type of event ever present itself again. (See chart at right.)

The NCOs noted that placing a liaison at the patient triage site allowed supply chain management personnel to know demands in real time without disrupting the care being provided on site. This allowed clinicians to turn to one person and communicate needs without having to use telephone lines or other media to convey critical supply demands. This enabled the NCOs to have resupply ready to go when the trucks returned to reload.

At one point, because of misunderstandings related to what was actually needed at the incident command site, a medic and a pharmacist were even sent to the

Cold-Weather Injury Push Pack

- Blankets (variety of types)
- Patient warming pads
- Thermal angels (battery packs and tubing)
- Patient warming devices (Bair Huggers)
- Hypothermia kits
- Bandaging material
  - ❏ Gauze (variety of sizes)
  - ❏ Kerlix wrap
  - ❏ Ace wraps (4 inch and 6 inch)
  - ❏ Tape (variety of types and sizes)
- Ring cutters
- Bandage scissors (variety)
- Distilled/sterile water
- IV fluids 500 milliliter bags (sodium chloride, lactated ringers, D5W)
  - ❏ IV starter kits
  - ❏ Tubing
  - ❏ Anglo catheters
  - ❏ Sharps containers
  - ❏ Alcohol prep pads
  - ❏ Tourniquets
- Epinephrine pens
- Atropine injectors
- Portable oxygen cylinders
  - ❏ Adult and pediatric face masks
  - ❏ Nasal cannulas
  - ❏ Regulators
  - ❏ Christmas tree connectors
  - ❏ Ambu-bags (adult and pediatric)
  - ❏ Oxygen wrenches
- Defibrillators
- Pulse-oximeter devices
- Disposable hospital slippers
- Triage tags
- Warming cabinet
- Human remains pouches

Note: ALL fluids should be brought out of the warehouse and warmed to at least room temperature immediately upon notification of a cold-weather mass casualty incident.

warehouse to "translate" requirements to supply personnel. This helped the team to process demands for items that they were unfamiliar with. The pharmacist provided invaluable assistance to logistics personnel when clinicians at the site were requesting specific types of medications that the enlisted logisticians knew little about or could not understand through radio communications.

As each truckload of supplies was sent out of the warehouse, data entry clerks placed orders into the Defense Medical Logistics Standard Support Customer Assistance Module. Orders were transmitted to the U.S. Army Medical Materiel Center-Southwest Asia (USAMMC–SWA) when each load left the warehouse. During the after-action review, NCOs related how USAMMC–SWA, at one point during the turmoil, actually called and asked what was going on. Once the distribution center was advised of the incident and understood the ensuing MASCAL, USAMMC–SWA responded accordingly and began to fill the theater's demands related to the MASCAL immediately.

Because of the volume of patients flowing into the Bagram triage site and estimates about what to expect throughout the next 24 to 48 hours, it became evident that an emergency resupply would be needed. The data entry clerks and customer service team in the warehouse placed a call to the theater distribution center and advised USAMMC–SWA of the impending critical shortages of cold-weather injury supplies. USAMMC–SWA responded by filling critical shortages and pushing supplies into Afghanistan immediately. By 1000 the next morning, the MEDLOG warehouse was restocked and operating at full capacity again.

As a result of this experience, the MEDLOG company's leaders drafted a 48-hour continuity of operation plan that emphasized conserving manpower. During the incident, the incident commander advised staff members to expect the operations to continue over a 24- to 48-hour period. Since the MEDLOG company still had to support its organic, theater-wide mission—sustaining the entire theater of operations—its leaders developed a work-rest cycle for the Soldiers. Leaders were concerned about depleting the company's manpower during the initial response, so NCOs divided the company into teams and sent some home for rest while others continued to support the relief efforts.

What Didn't Go Well

Medical logistics support could have been executed better in three areas: communications, preconfigured loads related to cold-weather injuries, and basic supply chain management responsibilities.

Communications. Although a Soldier was positioned on the flight line to communicate demands between the triage site and the warehouse, no other means of communication was available. As each resupply order was loaded into trucks and dispatched to the scene, no

knowledge of its arrival was available to the incident command team. The only way the logistics team at the site knew the resupply was coming was when they saw the trucks arriving on scene. To correct this, the 484th MEDLOG was advised to purchase two-way radios for communicating the various stages of the ongoing resupply during critical incidents.

Another element of communication that could have resulted in significant shortfalls was the use of clinical vernacular when requesting supplies. Clinicians are accustomed to asking for things by their "street names" inside the clinics, where time is available to find out exactly what is needed or when a resupply can happen before an incident occurs. In a critical incident, MEDLOG professionals may not know or understand this vocabulary and may be unable to respond appropriately to clinical needs.

For example, clinicians were asking for pulse-oximeters (devices for measuring the levels of oxygen saturation in a victim's blood). One Soldier thought instead that the clinicians were requesting "pole boxes" (pulse-ox is often what the device is called) and was unclear about what was needed. A biomedical maintenance NCO realized quickly what was needed—SpO2 monitors—after a medic was brought to the warehouse to describe what was being requested.

In another instance, clinicians at the incident site were asking for "Christmas trees," which caused several minutes of confusion about what was actually being requested. The confusion this caused for inexperienced personnel is obvious. The Christmas tree is small green triangular connector used to connect tubing between an oxygen cylinder and patient mask.

Preconfigured loads for cold-weather injuries. As previously noted, the avalanche inspired MEDLOG Soldiers to develop a cold-weather injury push pack. This need had not been identified as even a remote possibility before this incident. A variety of fluids for intravenous (IV) therapy and medication management, wound care, and drinking should be included in the push of materials to a critical incident site.

Simple things, such as warm fluids, are required when responding to a cold-weather incident. Warm fluids are less traumatic for patients during IV therapy and while rewarming the body. Steps such as placing various types of medical fluids, including drinking water, in a heated area immediately upon notification of a cold-weather incident are critical when managing patients who have been exposed to hours of cold weather and freezing temperatures.

Simple and impromptu steps such as turning on a heater inside the transport vehicle and placing fluids inside the cab of the truck could also help in warming fluids while en route to the scene. Finally, if available, a warming cabinet should be taken to the triage site to maintain warm fluids on scene.

This device, which is used to connect tubing between an oxygen cylinder and patient mask, is called a "Christmas tree" by clinicians. Using this term to request the device caused confusion at the warehouse.

Basic supply chain management responsibilities. The 484th MEDLOG company NCOs said that the biggest lesson learned was to have multiple skill sets at a critical incident site. During the avalanche response effort, only one junior medical logistics technician was sent to the site to relay supply demands to the warehouse team. In some instances, this resulted in miscommunication of what was needed. The NCO leaders asked that in the future they be permitted to dispatch a self-developed crisis response team that includes a medical logistics technician, a biomedical repair technician, and a pharmacy technician.

Another key discussion point during the after-action review involved the availability of supplies outside of what would ordinarily be required. Pediatric supplies were being requested at the site but are not commonly stocked in the MEDLOG warehouse since most of its supplies are for adult Soldiers involved in combat. NCOs recommended that for future incidents, the MEDLOG warehouse be permitted to maintain minimal stocks of pediatric supplies since those items are commonly needed during MASCAL events in Afghanistan.

As the incident closed and no more patients were being received at Bagram, excess supplies were brought back to the warehouse for reintegration into routine operations. This resulted in overstocking of some items throughout the warehouse. Although this cannot be completely avoided, having a packing list or push pack for future incidents of this nature could prevent overstocking during post-incident recovery operations.

Another issue that resulted in overstocking was having multiple agencies requesting and receiving supplies throughout the incident. The MEDLOG company's leaders recommended that incident command teams stay with one source of supply so that what belongs to the warehouse returns to the warehouse after the scene is cleared. In this incident, much of the overstock was the result of multiple agencies bringing supplies to the triage site and leaving them behind after the incident response efforts concluded.

What Could Be Improved for Next Time

The MEDLOG company's leaders identified actions that could be taken to improve operations should they be faced with a future incident of this kind. Primarily, areas identified for improvement were directed toward communication and supply chain control.

Communication. Communication is a variable that routinely causes the most consternation in a critical incident. Although it can never be completely perfected, elements of more effective, efficient communication can be adopted to mitigate shortfalls during future events. The MEDLOG company's Soldiers identified a need for additional communications assets. The two radios they had at the time of this incident were not configured for short-range communications or prepared for the response. (The batteries were not fully charged.) As a result, the company leaders evaluated the cost of buying different styles of two-way radios with charging stations to have more resources available at a time of need.

Another element of communication involved personal communication and the exchange of requirements between the triage site and the warehouse. To address the issue of the warehouse personnel not recognizing the terms used by medical clinicians when requesting supplies and equipment, the MEDLOG Soldiers recommend having a medic positioned at the warehouse to provide immediate translations. The medic would serve as the medical liaison, much like the MEDLOG Soldier at the critical incident site. By establishing this type of relationship at the initial onset of the response, supplies can flow into a critical incident site more efficiently and with less disruption.

Supply chain control. Agencies involved in a disaster situation have little regard for what is being used or how often it is needed. Therefore, one person should be identified from the outset to be a store keeper at the site. Foot traffic into and through the supply distribution point should be controlled, and each request should be documented so that reorders can be filled according to need. The Soldier should know which items are being used most and which supplies are not needed at all; resupply should be based on the volume of use.

For example, Proventil (an inhaler device for someone experiencing bronchial distress) was available—several 100-count boxes of inhaler devices—and was never used throughout the incident, but blankets could not be kept on hand because they were being used so frequently. This type of mistake results in space being used to store items that are not needed throughout the incident while other more-needed items are not stocked.

The medical logistics supply point should be the single source of medical supply throughout a critical incident response. While agencies should never be prevented from bringing additional medical supplies to the site, all materiel should be consolidated at one issue point to prevent clinicians from having to search for supplies. Items can be stored in containers labeled to identify the agency that brought them to ensure that agencies get their supplies back once the event concludes. The Soldier assigned the duties of accounting for materiel can be used to assist in this effort.

An element that is often overlooked in a critical incident is warehouse security and control. In many MASCAL incidents, every customer may not be aware of the circumstances. Having a person at the warehouse entrance to explain the situation gives customers the opportunity to return later to obtain supplies that are not needed immediately. The Soldier at the entrance can take requests of customers involved with the incident so that they do not have to search for someone to manage their orders. The warehouse personnel also can serve multiple agencies trying to respond to the same situation without inundating the warehouse team with duplicate requests.

Security and control are essential during a MASCAL incident. People will continue to need routine supplies. While customers should not be dissuaded from getting what is required, without control in place during a critical incident, shelves can be quickly exhausted without the knowledge of the warehouse personnel if the flow is not monitored and regulated. Obviously, this can result in significant shortfalls for multiple agencies involved in a variety of operations—some unrelated to the incident itself.

At the conclusion of the MASCAL incident, the medical teams that responded to the avalanche had treated, processed, and assisted 276 patients in approximately 6 hours. Of the 276 patients who were treated at the triage site, 2 died and 11 were sent to the base hospital, leaving more than 250 people who were able to be treated on scene at the triage site and released.

A direct contributing factor in this success was the ability of medical logistics professionals to respond to the immediate needs of clinicians at the triage site. In this instance, medical logistics competence, adeptness, and professionalism assisted in the tremendously successful outcome of what could have been a greater tragedy.

Captain Jerry D. VanVactor was the deputy G–4 for the 30th Medical Command during the Salang Pass avalanche. He holds a B.S. degree from Athens State University, an M.S. degree from Touro University International, and a doctor of health administration degree from the University of Phoenix.

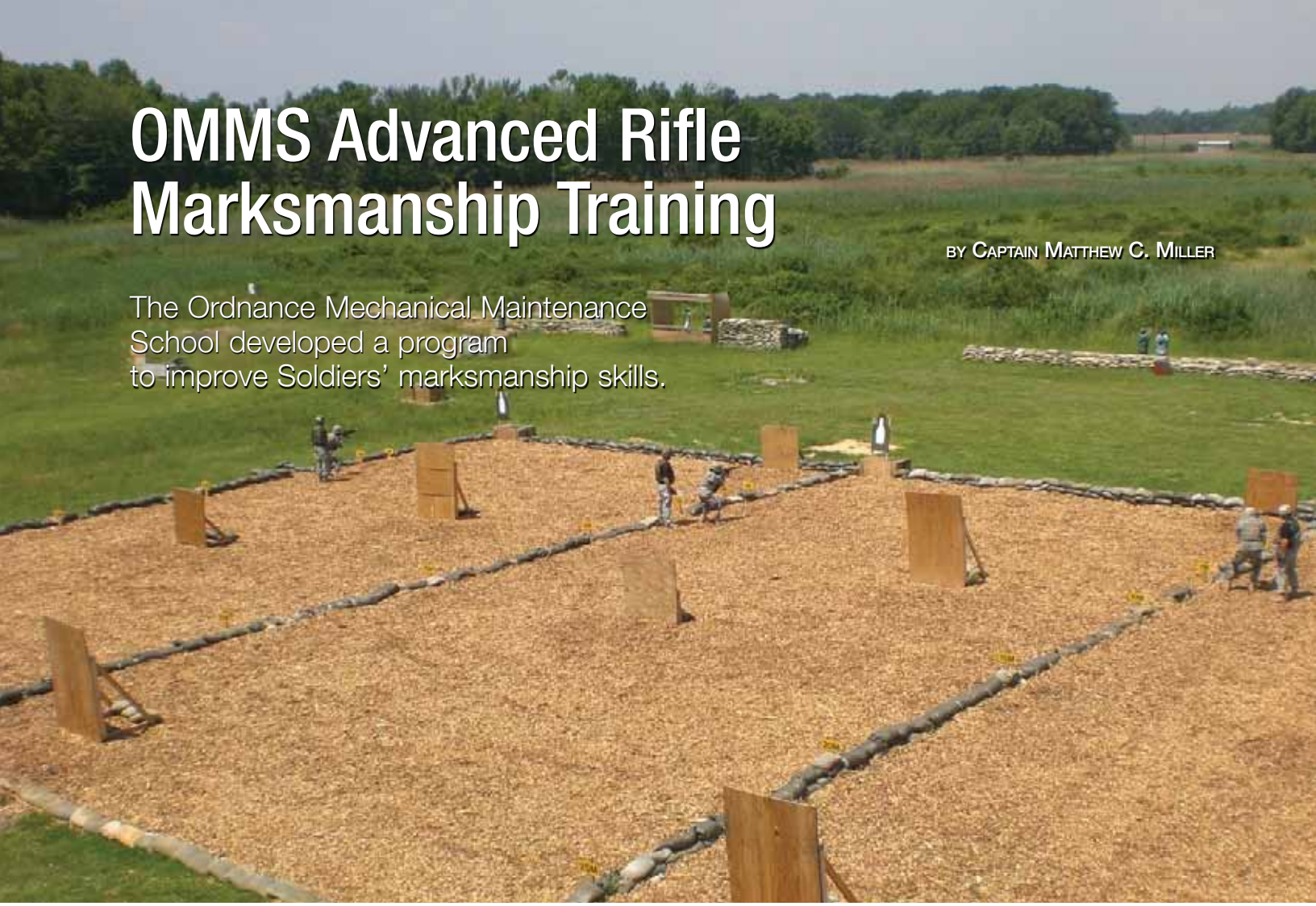
Captain Jason Donovant, USAF, is the chief of medical logistics for the Combined Joint Task Force-82 Surgeon's Cell. He holds a B.S. degree from Colorado Christian University and an M.B.A. degree from North Central University. He was recently selected as the Air Force's Outstanding Medical Logistics Company Grade Officer of the Year.

First Lieutenant Michael Dinh-Truong, USAR, is an Active Guard/Reserve officer. He was the medical logistics officer for the 484th Medical Logistics Company when he wrote this article. He holds a bachelor's degree from Edinboro University of Pennsylvania and a doctoral degree from Texas Chiropractic College.

OMMS Advanced Rifle Marksmanship Training

BY CAPTAIN MATTHEW C. MILLER

The Ordnance Mechanical Maintenance School developed a program to improve Soldiers' marksmanship skills.



In early 2010, Lieutenant General Mark Hertling, the deputy commanding general for initial military training (IMT) of the Army Training and Doctrine Command, addressed IMT commanders in an effort to identify the strengths and weaknesses of the advanced individual training (AIT) currently provided at each site. One of the key areas that General Hertling addressed was the need to develop and implement a more attainable set of warrior tasks and battle drills while continuing to ensure that the standards remained consistent for all Soldiers receiving training at the various AIT sites.

Training commands have had a difficult time keeping pace with the high operating tempo and constant changes in enemy tactics, techniques and procedures in Iraq and Afghanistan. The introduction of new equipment like the mine resistant ambush protected vehicles (MRAPs) has also created a training gap because MRAPs were being produced and shipped directly to the Soldiers in the theater and the equipment was not available for training stateside.

All AIT programs should be capable of maintaining the proficiency of Soldiers' basic and advanced rifle marksmanship, and that is where the Ordnance Mechanical Maintenance School (OMMS) at Aberdeen Proving Ground, Maryland, decided to concentrate its efforts.

Developing Marksmanship Instructors

One primary collective task that was not consistent across all AIT programs was the convoy live-fire exercise. In lieu of the convoy live-fire exercise, OMMS decided to set up an advanced rifle marksmanship (ARM) range. Before building the range, the 61st Ordnance Training Brigade at Aberdeen Proving Ground [now reflagged as the 59th Ordnance Training Brigade at Fort Lee, Virginia] selected a number of cadre to attend training conducted by the Army Marksmanship Unit (AMU) at Fort Benning, Georgia.

The AMU trained the cadre on the skills needed to build, set up, and instruct AIT Soldiers on the ARM range. The instructor training was conducted over a 5-day period and focused on six areas: basic rifle marksmanship safety, principles, positions, ballistics and zeroing, wind and weather, and shooter-target analysis. Following the AMU training, the cadre were certified as instructors.

The advanced rifle marksmanship range at the Ordnance Mechanical Maintenance School refreshes advanced individual training Soldiers on marksmanship skills learned in basic combat training.

The cadre then returned to Aberdeen Proving Ground, where they built a fully functional live-fire range and developed the program of instruction for ARM.

Implementing the ARM Range

The goal for the ARM range is to provide ordnance Soldiers with a strong refresher of the ARM program that they receive during basic combat training. During the initial training stage of the ARM training, the students receive 2 hours of primary marksmanship instruction before attending the range. Here the instructors reinforce the fundamentals of proper stance, weapon magazine change, and movement techniques from varying cover and concealment positions.

The next stage of ARM training is an intense 8-hour step-by-step phased block of instruction on the execution of live-fire training. During this phased instruction, the cadre provide the Soldiers with a live demonstration to show them what "right looks like." Each Soldier then receives hands-on coaching from the cadre while engaging in a blank-fire iteration of the short-range marksmanship lane and the barricade transition lane. This portion of the training requires the most time because it allows the Soldiers to receive immediate feedback and make corrections identified by the cadre.

Once Soldiers are proficient on this portion of the training, instructors begin the practice portion of the dry-fire range. When the cadre is confident that the Soldiers understand and demonstrate the skills on the dry-fire range, the students are moved to the next phase of training—the live-fire exercise.

The Live-Fire Exercise

The live-fire exercise is the culminating event that incorporates all of the techniques learned during ARM instruction into a single training event. Each Soldier is provided a traditional silhouette with a smaller targeting area inside of it that is shaped like a bowling pin. (See photo below.) This target forces Soldiers to control their fires within the critical zone. Soldiers must effectively acquire the target and control their weapons while moving down the lane. During the short-range fire lane, Soldiers receive orders from the tower to engage the target from different distances while both on the move and at fixed positions.

After successfully completing the short-range fire lane, the Soldiers move to the barricade transition lane. In this lane, the Soldiers incorporate their marksmanship and stamina. The coaches act as safeties to closely support Soldiers while they maneuver from one barricaded position to another and engage targets downrange. When Soldiers complete the lane, all of the targets are recovered so that the cadre can provide the Soldiers with feedback on their engagements.

The OMMS advanced rifle marksmanship range increased Soldiers' confidence and abilities to engage targets with their assigned weapon and prepared them to enter the force. Hopefully, this concept will be carried forward as the school moves to Fort Lee this summer.

Captain Matthew C. Miller is attending Intermediate Level Education at the Army Command and General Staff College. He was the commander of W Company, 143d Ordnance Training Battalion, at Aberdeen Proving Ground, Maryland, when he wrote this article. He holds a bachelor's degree in international affairs and government politics and a master's degree in conflict resolution and analysis from George Mason University. A prior-enlisted logistics officer of the Quartermaster Corps, he is a graduate of the Infantry Officer Basic Course and the Combined Logistics Captains Career Course.

The target used for the live-fire exercise contains a bowling-pin shape at its core to get Soldiers focused on the critical zone of the target. In this photo, this target is to the far left of the shooter.

Sustainment Technologies for BCT Modernization

BY THOMAS HOSMER

As the Army undertakes a brigade combat team modernization program, new technologies can improve sustainment of both the current and future forces.

Sustainment technologies managed by the Program Executive Office (PEO) Integration under the Army's Brigade Combat Team Modernization (BCTM) Plan offer great potential benefits to the sustainment community and the Soldier. These new technologies can provide situational awareness of logistics from the enterprise level (such as the Army Materiel Command, the Department of Defense [DOD] Global Information Grid, and industry) to the warfighter level.

The Army established PEO Integration in October 2009 following the Secretary of Defense's decision to cancel the Future Combat Systems (FCS) program. The Secretary instructed the Army to transition to a modernization program consisting of a number of integrated acquisition programs. PEO Integration manages acquisition programs that support BCTM.

BCTM offers two main challenges to sustainers. One is to insert into current force platforms new sustainment technologies that can assess the readiness of those platforms and the infantry brigade combat team (IBCT) by transmitting embedded sensor data throughout the IBCT and back to the enterprise. The other is to align new sustainment technologies with the ongoing development of the Army's Common Logistics Operating Environment (CLOE) architecture so that the current force and BCTM can work smoothly with the Army's logistics enterprise.

Condition Based Maintenance Plus

DOD Instruction 4151.22, Condition Based Maintenance Plus (CBM+) for Materiel Maintenance, defines CBM+ as "the primary reliability driver in the total lifecycle systems management (TLCSM) supportability strategy of the Department of Defense."

The capabilities required to implement this instruction include enhanced diagnostics and prognostics, failure trend tracking, electronic maintenance aids, serialized item management, automatic identification technology, and interactive maintenance training. Program managers are required to optimize operational readiness through affordable, integrated, embedded diagnostics and prognostics.

BCTM Sustainment Technologies

The main BCTM sustainment technologies are the Platform Soldier-Mission Readiness System (PS–MRS), Logistics Decision Support System (LDSS), and Logistics Data Management Service (LDMS). The PS–MRS provides diagnostic and prognostic capabilities through the Vehicle Embedded PS–MRS (VE–PS–MRS) and the PS–MRS Decision Accuracy Validation System (PDAVS), respectively.

LDSS provides maintenance management functionality within the IBCT. It supports the overall sustainment concept for BCTM by providing logistics operation planning and execution capabilities.

LDMS provides the status and location of national-level assets of BCTM spares and repair parts to product support integrators and enables a guaranteed level of performance and system capability. Its capabilities equate to performance-based logistics (PBL).

Sustainment technologies will provide critical logistics data in two areas defined by the warfighter as crucial for BCTM. One is running estimates of mileage, hours of operation, fuel consumption, health status of platforms, and critical consumables (fuel, battery, coolant, and potentially oil). These data must be delivered in near-real time.

The other area is data on sustainment tasks. The technologies provide all of the data a crew chief operator needs to perform maintenance. These data must be delivered in less than 15 minutes to ensure that operating tempo is maintained. The data will allow the operator to open up a job request through LDSS, close out a job, order parts, receive parts, update the digital logbook, and host the Interactive Electronic Technical Manual (IETM) on the handheld controller. The IETM allows the warfighter to read the platform's technical manual for repair and diagnostics.

Current Force Sustainment Capabilities

The current force has these capabilities:

- Manual troubleshooting and built-in tests.
- Manual data entry of parts orders, which is subject to human error.
- Use of the Commodity Command Standard System and Standard Army Maintenance System. These are enhanced software that use automated, 1960s-era 80-column card data formats. They are slowly being replaced by the Logistics Modernization Program and the Global Command Support System-Army, which are enterprise resource planning systems.
- A manual process for entering repair parts requested into logistics Standard Army Management Information Systems.

- Manual entry of logistics status report joint variable-message-format messages into the Force XXI Battle Command Brigade and Below (FBCB2) system.

Compared to the capabilities of the proposed BCTM sustainment technologies, current force systems face the following deficiencies:

- Frequent downtime, resulting in lower operational readiness rates.
- Increased costs for spares.
- Antiquated automation, resulting in high error rates and higher costs to populate the logistics pipeline.
- Extended delay time for executing administrative logistics tasks.
- Manual entry of data, resulting in added downtime and reduced operational readiness.

Technologies for the CLOE Architecture

System design without logistics in mind is not sustainable over the system's life cycle. Readiness assessment and the transfer of sustainment data within the theater of operations to the DOD enterprise can be realized with the products being developed by BCTM and the architecture developed by CLOE.

CLOE's architecture, a design for CBM+, is named the Army Integrated Logistics Architecture (AILA). AILA is the tool used to establish the operational views, technical standards, and intersystem relationships that will govern the design and implementation of Army logistics information processes during the transition from the current to the future force.

BCTM sustainment technologies will provide the capabilities to realize the AILA architecture for PEO Integration. BCTM sustainment technology products PS–MRS (for diagnostics and prognostics), IETM (for interactive digital technical manuals), LDSS (for planning sustainment resupply), and LDMS (for achieving PBL) are naturally linked to AILA.

Current Force Upgrade

The PS–MRS can be used to determine the health status of current force platforms. That can be done by connecting the Network Integration Kit (NIK) to the diagnostic data ports already present on current force platforms. The cost of integrating PS–MRS technology should be minimal since the diagnostic data ports already exist on the current force platforms.

To use the full capabilities of PS–MRS and LDSS to generate a common operating picture (COP) for logistics in increment 2 of BCTM, NIK can be integrated with the current force platforms. This will permit the health condition of the network node (the Integrated Computer System) and the health status of the platform to be reported to the IBCT.

Current force platforms use FBCB2 in radio communications to other platforms. A way to extend logistics data beyond FBCB2 for the warfighter would be to communicate logistics data through the Institute of Electrical and Electronics Engineers communication protocol (IEEE 802.xxy) inserted onto the NIK. This design consideration is already fielded with the use of the IEEE 802.xxy protocol used by the Combat Service Support Automated Information Systems Interface that interfaces with the very small aperture terminal.

Information Assurance

BCTM sustainment technologies must meet the challenge of information assurance (IA) compliance. The PS–MRS interacts with data at the platform level, but the LDSS rolls these platform data up to provide readiness status and capability. Hence, the LDSS is classified while PS–MRS data are not classified.

In the network world, the LDSS transfers its information using the Secure Internet Protocol Router Network and the PS–MRS transfers its information via the Non-Secure Internet Protocol Router Network (NIPRNET). In order for the PS–MRS, with tactical unclassified information (TUI), to communicate with the LDSS, with secret information, a cross-domain solution has to be developed to allow the classified and TUI products to communicate with each other within each platform's NIK.

The PS–MRS data residing on the TUI enclave on the NIK currently do not have a networked path up to the logistics assets within the IBCT. This is due to a mismatch of security enclaves. A controlled interface (CI) between TUI and NIPRNET needs to be defined to accommodate the necessary protections. The CI may be located in the enterprise. The benefit of an enterprise location is that it allows for the management of a single CI rather than the management of multiple embedded CIs on the battlefield.

Another benefit of using a singular CI is that the verification of a singular CI in sanctuary may be less expensive than having to verify the IA for multiple embedded CIs across the platforms.

The Department of the Army G–4 and CBM+ requirements can be realized with PEO Integration's BCTM sustainment technologies. These BCTM sustainment technologies (PS–MRS, LDSS, and LDMS), coupled to the AILA architecture, will achieve the requirements of CBM+, the desires of the Army G–4, and the advantages of a common logistics data set. Current force platforms can be upgraded to PEO Integration sustainment technologies by using the existing diagnostic ports on the platform. Once integrated, logistics data can be disseminated across the IBCT and into the logistics enterprise, providing the commanders a common operational picture for logistics.

With BCTM sustainment technologies, Army commanders and logisticians will have logistics situational awareness and logistics theater planning through automation. The commander and logistician will receive resupply plans while they address the adversary, allowing the operating tempo of the battle to be continuous. With BCTM sustainment technologies, the logistics footprint will be reduced because commanders and logisticians will know the location of all assets in the theater and can use automation to efficiently resupply and repair weapons for the warfighter.

Thomas Hosmer is the lead sustainment architect for logistics products at the Program Executive Office Integration.

Into Africa: Natural Fire 10

BY TODD L. JOHNSTON

U.S. Army Africa recently conducted Natural Fire 10, a multinational exercise in Uganda, and successfully overcame logistics problems that were complicated by cultural differences.

In fiscal year 2009, the Southern European Task Force (Airborne), based in Vicenza, Italy, was redesignated from an airborne joint task force headquarters to U.S. Army Africa (USARAF), the Army service component command of the nascent U.S. Africa Command (AFRICOM). Recently, USARAF has worked to restructure internally as it becomes a full Army service component command. Joint Chiefs of Staff Exercise Natural Fire 10 was the command's first major exercise and the largest deployment of U.S. forces in Africa since World War II.

Just mentioning Africa conjures romantic images of wild animals, mysterious peoples, and pathless jungles. Although logistics services in Africa are not as widely available as they are in the United States or Western Europe, all manner of logistics support is

At left, a CH–47 Chinook helicopter delivers troops to Kitgum, Uganda. Using the CH–47 allowed the direct delivery of personnel and vital equipment so that Soldiers could avoid using the unpaved road from Gulu, Uganda.

now available from host nations, the United Nations, nongovernmental organizations, and commercial contractors. Every day, businesses turn profits, goods and people move, and cell phone coverage is available and affordable.

However, operating in Africa is not necessarily simple or straightforward; success there requires a highly adaptive application of logistics principles and practices, as USARAF found while conducting Natural Fire 10. This is the story of how flexibility, experimentation, and innovation generated success from the strategic to the tactical levels.

The Logistics Challenges of Africa

Africa is disjointed and internally disconnected in a way that few other places are. This is a result of the effort a century ago to define its borders without taking into account the natural relationships of its peoples. Africa presents physical, administrative, and cultural challenges.

The physical size of the African continent is hard for many people to fathom. With a land mass more than three times that of the continental United States, Africa presents daunting distances. For example, the distance from Tunis, Tunisia, to Pretoria, South Africa, is roughly the same as that from Frankfurt, Germany, to Chicago, Illinois.

More than 90 percent of the population and services are within 100 miles of the coastlines, and the limited Non-Secure Internet Protocol Router Network disappears rapidly toward the continent's interior. Roads, ports, and airfields are frequently inadequate for heavy military use. Fifteen countries are landlocked, which complicates their infrastructures and causes administrative hurdles. Automated in-transit visibility (ITV) is nonexistent.

Africa is not a country, but a continent composed of 54 nations and 400 ethnic groups using 2,000 languages. The fact that there are few large-scale centralized agreements between nations greatly complicates diplomatic clearances for aircraft as well as customs procedures and border clearances for surface cargo. Border stations for surface cargo can be remote and unsupervised with subjective standards of enforcement.

When it comes to contracts, local providers may have trouble accessing the Department of Defense's (DOD's) web-based bidding system because many African businesses do not yet use the Internet. In a cash economy, payments from DOD systems are cumbersome. These procedural problems are manifestations of broader cultural issues that must be considered when operating in Africa. The continent cannot be transited without dealing with multiple customs departments, difficult highway conditions, inadequate railroads, and security problems. And keeping an operation within the borders of one country is impossible.

African supply and service operations are often an exercise in "expectation management." The single largest cultural challenge for U.S. military logisticians and commanders is the importance of time. Things move slower—period. All operations are directly affected by the availability and condition of the infrastructure. When the infrastructure is less developed, logisticians must use lighter loads and smaller platforms, which greatly extend delivery times.

When conducting cooperative operations with African forces, U.S. personnel must place less emphasis on clocks and calendars. Of greater importance, and perhaps even more difficult, is the need to develop an appreciation, or at least an understanding, of informal authority structures. Families, clans, tribes, and local leaders can often wield greater influence in specific areas than a national government.

Natural Fire 10

During Natural Fire 10, USARAF encountered all of these challenges and, for the most part, overcame them by using the adaptive logistics network concept, which maximized the use of existing systems on the continent. USARAF adhered to an efficiency-driven business model that emphasized a small military footprint, clearly understood objectives, and minimal control over the distribution process.

Natural Fire 10 was planned as a cooperative exercise among five East African nations (Uganda, Tanzania, Rwanda, Burundi, and Kenya) and the United States. It consisted of a brief "table top" session in Kampala, Uganda, and a 2-week joint field training exercise and humanitarian and civil assistance operation with 1,500 soldiers representing 6 nations.

Soldiers watch a crane in operation at Kitgum, Uganda. All materials-handling equipment was provided under the Military Surface Deployment and Distribution Command's Universal Service Contract.

The exercise was conducted at the site of a remote Ugandan army post in Kitgum, Uganda, which is approximately 600 kilometers by road north of Entebbe and close to the Darfur (Sudan) border. The African soldiers simply drove to Kitgum, but the U.S. deployment was somewhat more complicated.

The U.S. deployment involved moving 600 passengers and 300 pieces of major equipment by surface and air. Kitgum's remote location was the main mobility challenge since it is more than 1,600 kilometers inland from the seaport in Mombasa, Kenya, and approximately 100 kilometers from the nearest usable airfield, Gulu Airport in Uganda. To make matters worse, the final 100 kilometers of the road to Kitgum are unpaved, which was a problem because the exercise was held at the beginning of the equatorial rainy season.

The Original Plan

The original deployment plan was to move sensitive items and passengers by strategic airlift to Entebbe International Airport in Uganda, then use C–130 Hercules aircraft from the 17th Air Force to move to Gulu Airport, and then proceed by truck or bus to Kitgum. Bus movement from Entebbe to Kitgum was planned as backup but was not favored by the Ugandan gendarmerie.

Surface cargo would move door to door using the Military Surface Deployment and Distribution Command's (SDDC's) Universal Services Contract from multiple home stations in the United States and Europe through Mombasa to Kitgum. The contractor would assume responsibility for all customs clearances, border crossings, ITV, and subcontracting of required materials-handling equipment. SDDC would position an experienced operations officer in Mombasa to provide ITV and liaise with the contractor. By setting up the contract in this manner, USARAF could avoid deploying military personnel to the Mombasa port or to other key locations where movement control elements are generally found.

The planned logistics support for the Entebbe element was straightforward. Approximately 100 passengers from the USARAF command and control element would stay in two local hotels that included meals and laundry as part of the contracts. A small fleet of rental vehicles and minibuses would transport personnel from billeting to the military airfield at Entebbe, where the command post would be located.

In Kitgum, we contracted for the construction of a temporary life support area with showers, latrines, a dining facility, and sleeping facilities for 500 Soldiers. The Defense Logistics Agency would provide meals and bottled water, and the 21st Theater Sustainment Command would provide two reverse osmosis water purification units (ROWPUs) for bulk potable water. Three days of reserve rations and water would be stored at Gulu, which would also be used as an intermediary airfield to transfer passengers and sensitive items to Kitgum.

Changing Plans and Making It Work

No plan survives first contact, and Natural Fire 10 was no exception. The first hurdle was the airfield at Gulu. Although Gulu was listed as capable of accommodating C–130s and C–17 Globemasters, an airfield survey determined that Gulu's runway strength actually was unsuitable for C–130s. The 17th Air Force had no further part in the exercise and could not provide aircraft support, and the Ugandans preferred that we not bus several hundred Soldiers and Marines through Kampala and up to Kitgum.

We contacted the Reserve component 11th Tactical Aviation Command about the problem, and after some

planning and coordination, they agreed to bring three CH–47 Chinook helicopters from the United States into Entebbe by strategic lift. The 21st Theater Sustainment Command provided an aircraft assembly team at Entebbe and set up a class III (petroleum, oils, and lubricants) retail point at Kitgum using certified fuel from a Defense Energy Support Center contract. This extremely effective solution allowed us to bypass Gulu and deliver personnel directly into Kitgum. The only problem was the cost of the strategic lift from the United States.

When we started the contract-bidding process for construction of the life support area, we were already working on a short timeline. Exacerbating the time crunch were the requirement by African contractors for upfront payments and our internal procedures to procure funds through U.S. Army Europe.

The contract solicitation produced two bidders, and only one was African. Despite the contractor's efforts, the completion of the life support area was delayed by several days. Because of the delay, no place and no personnel were available to download surface cargo—much of which was already on the road from Mombasa—on its projected arrival date.

After a call to the SDDC representative in Mombasa, the contractor diverted the trucks into his own holding yard at Kampala with the stipulation that they could be delivered to Kitgum in 72 hours once we called them forward. This was accomplished with no direct intervention by USARAF or other exercise participants.

During the exercise, the continued maintenance of the ROWPU systems used for daily water purification at Kitgum was particularly challenging. During the peak water usage period of the exercise, when roughly 1,100 personnel were located at Kitgum, the ROWPUs were purifying up to 11,000 gallons of potable water daily, including water for consumption in the dining facility and for showers. ROWPU water was also being used to support the septic system because a well that was dug on site to support the portable toilet system was not producing the quantity required.

After several days of heavy use, the ROWPUs began to have significant maintenance issues. To keep the ROWPUs functioning, repair parts had to be shipped from Germany. After a water pump that transferred purified water from a ROWPU to the water tower (which supplied water to the shower systems) failed on several occasions, 21st Theater Sustainment Command Soldiers decided to replace the pump with a civilian swimming pool pump from a local Safari hotel until a replacement pump arrived from Germany.

An additional challenge was the difference in voltage between the military systems that were transported from Germany and the systems that were supplied by contractors. All military equipment was 110 volt, and all local equipment and power was 220 volt. The base camp was able to work around this using transformers and military power generation systems to power the field-feeding systems.

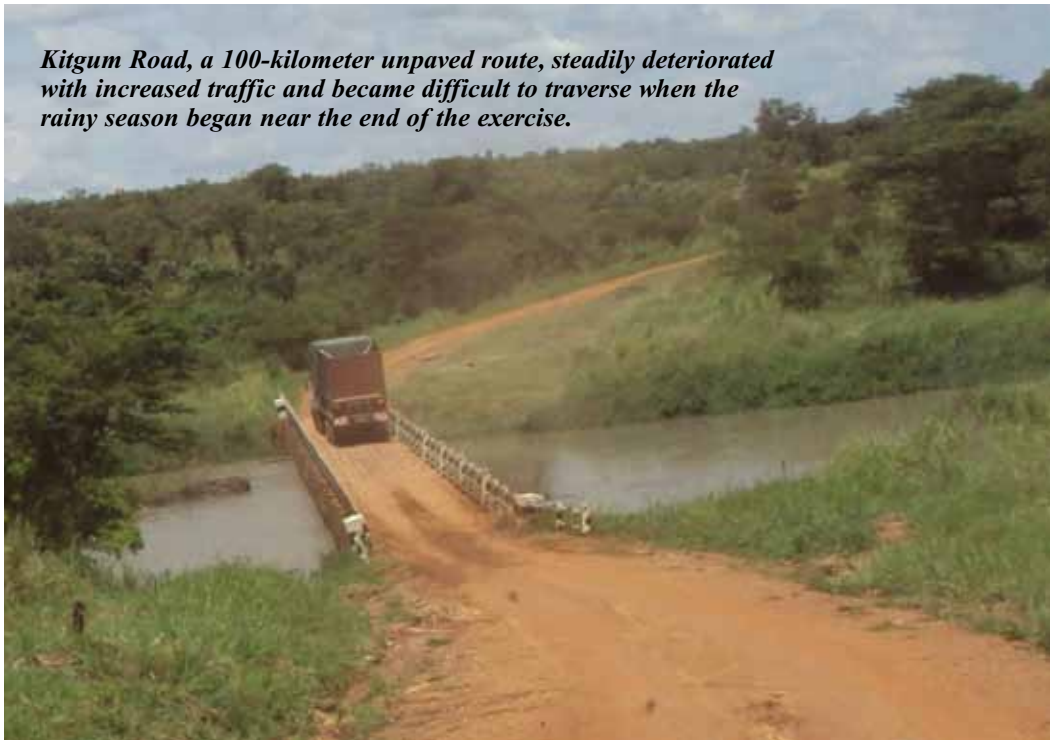
In keeping with our adaptive logistics concept of using existing assets and procedures and making use of relationships with other logistics providers, we had initially coordinated with the AFRICOM Deployment Distribution Operations Center (ADDOC) to use the C–17s of the Hungarian Airlift Wing (HAW) to redeploy the AFRICOM Deployable Joint Command and Control (DJC2) system back to Europe from Entebbe.

The day before the flight, ADDOC informed us that HAW would be unable to fly the mission because Libya denied the fly-over clearance. By shifting some of the DJC2 enablers (generators and environmental control units) to surface transport, we reduced the lift requirement to two C–130 loads. Unfortunately, the lack of available airframes resulted in a delay of over 30 days to retrieve the cargo. Despite these challenges, Natural Fire 10 was successful by all measurable standards and provided tremendous lessons for continued operations on the African continent.

Lessons Learned About Operating in Africa

In African operations, we must be comfortable with more uncertainty and greater flexibility when it comes to timelines. Not being able to see a status on a computer screen does not mean that nothing is happening. A plan or concept that requires rigorous adherence to precise timelines is likely unsuited to African scenarios.

Mobility is the key to success, so infrastructure and distance challenges require thoughtful, adaptive, innovative solutions. The need for reliable, flexible intertheater



Kitgum Road, a 100-kilometer unpaved route, steadily deteriorated with increased traffic and became difficult to traverse when the rainy season began near the end of the exercise.

A CH–47 Chinook helicopter approaches Kitgum, Uganda. Kitgum is the headquarters of the 401st Brigade, Ugandan Peoples Defense Force.

under current contracting regulations. Many vendors also do not understand the solicitation and bidding process for contracting opportunities.

To prevent this problem in upcoming major Joint Chiefs of Staff exercises, USARAF will conduct vendor conferences to teach prospective vendors about U.S. contracting policies and procedures. By working with small businesses, embassies, and potentially local Rotary clubs, USARAF will reach the businesses that may not be aware of how to do business with the U.S. Government.

SDDC's Universal Service Contract for surface movements works phenomenally well. The professionals should be allowed to do what they do best. SDDC has the contacts and the experience to move cargo, clear customs, and cross borders better than USARAF ever will in Africa. Through the contract, Maersk diverted shipments, maintained accountability, delivered supplies on time, and provided ITV of cargo moving on five vessels and numerous trucks from multiple locations.

airlift cannot be overstated. U.S. standards for aircraft operations are unlikely to be modified to accommodate the African infrastructure, and the African infrastructure will not quickly improve. These facts preclude major reliance on Air Force assets. Future intertheater air mobility on the continent is likely to be a combination of assets from the United States, international organizations, nongovernmental organizations, and commercial contractors.

The cultural differences in the way business is conducted in Africa and in the U.S. Army caused some notable problems. In many African cultures, business is a face-to-face affair and Internet access is not an important part of commerce. Furthermore, printed specifications of a requested product are good, but actual samples of what you need are far better.

Contracting in Africa is slightly different as well. One particular challenge was the issue of prepayment upon awarding a contract. Many African vendors expect a 50-percent or higher prepayment, which is not feasible

Africa, with its challenging infrastructure, vast distances, and variety of politics and cultures, provides a tremendous proving ground for logisticians supporting military operations. The lessons learned and solutions developed to overcome the challenges in Natural Fire 10 are already paying dividends for USARAF as it plans future operations on the continent in collaboration with African militaries, nongovernmental organizations, and commercial partners. Certainly, Africa has many more lessons in store as USARAF seeks to expand its capabilities and increase its presence there. But based on this exercise, it has an auspicious beginning.

Todd L. Johnston is the mobility division chief, G–4, for U.S. Army Africa in Vicenza, Italy. He is an Army Reserve lieutenant colonel and currently commands the 772d Civil Support Team. He is a graduate of the Sustaining Base Leadership Management Course and the Army Intermediate Level Education Course.

Defense Freight Car Operations Yesterday, Today, and Tomorrow

BY GEORGE GOUNLEY

In this photo, vehicles and equipment are unloaded from flatcars for movement to Fort Irwin, California, circa 1960.

In the language of railroading, a private car is one that is owned by an individual or organization other than a railroad. Private freight-car owners can be divided into nonshippers (such as leasing companies) and shippers. Becoming an owner-shipper is not an easy decision. The cost of purchasing a car is significant, and immersion in the arcane world of railroading is a necessity. Leasing cars instead of owning them yields nearly all the benefits of ownership and reduces the depth of commitment to shipping by rail that ownership entails.

Based on historical experience, three factors must be in place before private-car ownership becomes a plausible option for a rail shipper. First, the potential owner must expect the movements to continue long enough to recover the cost of the investment in cars—usually 15 years or more. Second, the cargo to be moved should require a specially designed car; more specifically, it must be capable of movement in bulk or have excessive weight or dimensions. Third, the specially designed cars must not be available from the railroads, at least not with attractive terms that encompass both the cost and the reliability with which the railroad can provide the cars when demand for them is at its peak.

The Armed Forces avoided owner-shipper status until World War I. However, they had extensive involvement in railroading before that. U.S. military railroads operated rail lines in the war zone during the Civil War, and the railroad's dominance of transportation in the years between the Civil War and the U.S. entry into World War I affected the Armed Forces as it did nearly every shipper.

World Wars I and II

When the military did become owner-shippers during World War I, they purchased tank cars, which were primarily used to transport the chemicals used in making munitions. From the reporting marks on the cars, it is likely that most of the cars were bought used.

The number of cars owned dropped by the time Germany invaded Poland in 1939, and tank cars made up essentially the entire fleet. However, although the tank cars owned at the end of World War I were almost all chemical tanks, the tank cars owned at the start of World War II were mostly for petroleum, oils, and lubricants (POL).

Between the start of the war and the attack on Pearl Harbor, the purchase of tank cars for POL service outpaced the addition of chemical tanks. However, by the end of the war, the services owned equal quantities of chemical and POL tank cars. During World War II, the Army's railcar fleet remained composed almost exclusively of tank cars; the only exception was 16 flatcars used for hauling canisters of chemicals. Yet, the Navy barely expanded its chemical tank car fleet and owned no POL tank cars; it purchased mostly boxcars and owned more hopper cars than tank cars.

Korean War

The inventory at the start of the Korean War shows that the services remained active in purchasing railcars even after the end of World War II. Although the overall number of cars owned dropped by about 200 and chemical tank cars dropped by almost 900, ownership of POL tank cars, boxcars, and flatcars increased. By the end of the Korean War, with the number of cars carried over from the previous war and the purchases between the wars, the number of cars owned by the services increased by more than 3,000.

Until the start of the Korean War, the services' fleets had been largely composed of tank cars. That changed by the end of the war, as the services increased their purchases of other car types. Noteworthy were the Army's purchase of flatcars (mostly to move the new and heavier Patton tank) and the Navy's purchase of DF boxcars to move ammunition. (DF stands for Damage Free, the trade name of a load securement system that consisted of slotted steel bars fastened to the inner sides of the car and lateral crosspieces that locked into those slots.)

The Army had the largest owner-shipper fleet on the continent with 6,754 cars—about 1,800 cars more than

the next largest fleet, which belonged to an oil company. The Navy's 2,538 cars made it the fourth largest owner-shipper.

Vietnam War

By the time the first ground combat units landed in Vietnam, all of the services' interchange freight cars were consolidated under the ownership and control of a predecessor of the Military Surface Deployment and Distribution Command (SDDC). The number of cars in the fleet had dropped significantly to less than the number owned at the start of the Korean War. Despite this, and despite the amazing growth of the number of cars owned during the preceding war, by the time U.S. involvement in Vietnam ended, the fleet had shrunk slightly for the first time during wartime. This was mainly caused by a reduction in tank car ownership. The Vietnam War therefore manifested two trends that continue to this day: the uncoupling of the size of the fleet from war and the reduction of the tank car portion of the fleet in both numbers and significance. Reflecting both of those trends, the delivery of 200 chemical tank cars in 1966 was the last significant wartime purchase of cars for the fleet and the next to last significant purchase of tank cars of any kind.

Post Vietnam

The first major delivery of flatcars after the Korean War took place in 1981, and more cars of the same design were purchased between 1983 and 1987. These cars were ordered for the same reason as their predecessors: a new tank, this time the M1 Abrams, was both too long and too heavy for the cars built for the M48. Unlike their wood-decked predecessors, the new cars had steel decks and chain tiedown devices for securing the tanks to the cars. They also had collapsible pedestals that, when raised, would permit the cars to carry 20- or 40-foot ISO [International Organization for Standards] containers.

Finally, because the flatcar was designed to carry the tank but the tank was not equipped to ride on the train, the new cars also had shackles that were to be used to attach the chain tiedowns to the tank, instead of using the weaker shackles standard to the tanks. Personnel unloading a tank were supposed to remove the car shackles and secure them with one of the chain tiedowns to the deck of the car so that they would be available for the next shipper. Occasionally, that actually happened.

Gulf War

While the Gulf War was not marked by any railcar shortages, it had three very important effects on the interchange fleet. First, the lack of demand for the older flatcars during the deployment killed discussion about keeping them as a sort of reserve fleet, so they were disposed of because of their age. Second, dispatching the new flatcars to meet returning shiploads of tanks that turned out not to be tanks after all led to the cars being loaded with a wide variety of equipment, which in turn paved the way for dropping the requirement to leave the shackles on the cars. Finally, the length of time that it took to deploy the Army, though not caused by car shortages, led to the Army Strategic Mobility Program (ASMP), a part of which was the purchase of cars for placement at Army installations where they were not to be used until there was a deployment.

The result was the purchase of more than 1,000 68- and 89-foot flatcars, which were delivered between 1994 and 2001. This was the last significant purchase of railcars of any type by the military. Like the tank-carrying cars bought in the 1980s, two of the three new car series had steel decks, chain tiedown devices, and collapsible pedestals, though they had only four axles instead of the six axles of the M1 flatcars. The third series of cars was composed of 89-foot flatcars that were bought used and equipped with pedestals for carrying containers of ammunition.

1990s

The 1990s saw deletions and additions that resulted in historic changes in the size and composition of the interchange fleet. By the end of 1993, all of the cars delivered during the Korean War had been removed from interchange service because of the then-current age restriction of 40 years imposed by the railroads. The number of interchange cars was cut almost in half from the 2,267 cars at the start of the Gulf War to a post-World War II low of 1,181 in mid-1994. The inventory then started to climb because of the ASMP purchases, until it hit 2,239 at the start of 2001. Tank cars, which made up most of the fleet as late as February 1985, dropped to 37 percent of the fleet at the start of the Gulf War and to 18 percent at the beginning of 2001.

The current size of the fleet is slightly under 2,100 railcars, of which 87 percent are flatcars. The ASMP cars constitute more than half of the current Defense Freight Railway Interchange Fleet. They are followed in size by the cars bought for carrying the M1 and then the POL tank cars. The remaining cars are all special purpose—all bought by the Navy except for 12 chemical tank cars bought by the Air Force.

Ownership Changes

The changes over the years in the way cars were owned and managed are almost as interesting as the size and composition of the fleet. In the beginning, the Army and the Navy both bought and managed their own interchange cars. With the Army, ownership and management was further decentralized between the Ordnance and the Quartermaster Corps. Presumably, this ended with the formation of the Transportation Corps during World War II. After the war, the separation of the Air

U.S. Forces Railcar Ownership

The chart lists the military's inventory at significant dates between the U.S. involvement in World War I and the departure of the last ground troops from Vietnam as well as the current inventory. This information is taken from the quarterly issues of the Official Railway Equipment Register, which lists all freight cars in interchange service in North America.

	World War I		World War II			Korean War		Vietnam War		Today
	April 1917	December 1918	July 1939	January 1942	October 1945	July 1950	July 1953	April 1965	July 1972	
Tank, Chemical	0	1290	69	355	2129	1256	1410	571	500	17
Tank, POL	0	50	477	1399	2132	2456	2618	2784	2433	197
Box			1	1	1511	1790	3640	999	1008	30
Flat			0	0	4	209	1319	904	899	1675
Flat, Special			0	0	94	21	21	32	44	127
Gondola						20	82			0
Hopper			0	0	107	28	35	3	0	0
Caboose										6
Refrigerator										9
Schnabel										2
Totals	0	1340	547	1755	5977	5780	9125	5293	4884	2063

Force from the Army led to the Air Force subsequently purchasing and owning a very small number of railcars, although management of its cars remained with the Army.

In 1956, a Department of Defense (DOD) directive vested control and operation of all interchange freight cars in the Army's Military Traffic Management Agency. The agency subsequently assumed management of the Army and Air Force fleets in 1957 and the Navy fleet in 1959. Ownership, however, remained with the purchasing services.

DTMS

By 1964, the military fleet was under the management of the Defense Supply Agency's Defense Traffic Management Service (DTMS). An audit that year found that proper implementation of the 1956 common management directive was impeded by a DOD requirement that DTMS also recognize "the specific requirements of all of the military services for railway rolling stock." Using this loophole, the Army required that DTMS pre-position over 50 percent of its heavy-capacity Army flatcars at certain installations.

DTMS obtained permission to use these pre-positioned cars at other locations during the 1962 Cuban Missile Crisis, but only after agreeing to obtain Army permission before using any Army-owned flatcars on behalf of the other services. The Navy, for its part, required that over 90 percent of the boxcars that it bought be pre-positioned at Navy ammunition depots. There, the DF cars, which were bought to simplify and accelerate interchange shipments, were used more for intraplant moves and storage than for interchange.

During the Cuban Missile Crisis, at least one facility shipped using railroad-owned boxcars so that it could use its pre-positioned interchange cars on the installation. In other findings, the auditors reported that installation transportation officers often did not bother to request cars from DTMS because DTMS rarely filled their requests, that the services prevented DTMS from disposing of unneeded cars, and that in 1 year shippers incurred $3.1 million in additional blocking and bracing costs because most ammunition shipments were made in plain boxcars rather than in DF cars.

As a result, in April 1964, DOD transferred ownership of all interchange cars to DTMS. In February 1965, ownership and management was transferred along with other DTMS functions to the Military Traffic Management and Terminal Service, a predecessor of the SDDC. In the next couple of years, the service reporting marks (USAX, USNX, and DAFX) were all changed to DODX. Although railroaders refer to the cars by their reporting marks, the unified fleet is formally known as the Defense Freight Railway Interchange Fleet (DFRIF).

Army Funding of General-Purpose Railcars

The 1964 DOD directive also charged the Army with funding the purchase of enough general-purpose railcars (cars capable of being used by more than one service) to meet the demand of all of the services. Since then, the individual services must fund the purchase of railcars whose design limits their usefulness to a single service. In the current fleet, the Army has funded the purchase of POL tank cars and chain tiedown or ISO container flatcars. All other car types are funded by the using service.

Regardless of the funding, once a car is accepted from the seller, it belongs to SDDC.

The purchase of general-purpose flatcars under the ASMP for the special purpose of supporting the Army's rapid deployment posed a potential problem reminiscent of the situation during the Cuban Missile Crisis. Because the Army was responsible for buying general-purpose cars for all of the services, what justification would SDDC have for refusing a request from another service to use the ASMP cars?

A resolution was reached that the cars would be considered special purpose and therefore could be assigned to Army installations for prompt response to a mobilization as long as there was no mobilization. Once there was a mobilization, then the purpose of pre-positioning the cars was accomplished and the cars could be used by all of the services until deployments ended. This policy is still in effect, and the ASMP cars have been used to support all of the services since the first deployment in support of Operation Iraqi Freedom.

Operating Cost

The cost of operating and maintaining the DRIF is supposed to be covered by the mileage allowances the railroads pay private car owners when their cars move loaded. Many years ago, these payments were usually enough to cover the capital as well as the maintenance costs of a car. Now, depending on the car type, the payments often are not sufficient to cover the cost of repairs. For example, the default tariff allowance for flatcars and boxcars (the rate charged in the absence of any special agreement) is 1.2 cents per loaded mile. At that rate, a car would have to move loaded 1,503 miles—halfway across the continent—to earn enough to pay for replacing a brake shoe, the most common repair.

Because the allowance earned per mile depends on the car type, the more private cars of a particular type owned by a private owner, the more clout the owner has in demanding compensatory mileage allowances. Since nearly all tank cars are private cars, the military's fleet ownership costs were fairly well compensated until the boxcar and flatcar purchases during the Korean War.

Beginning in the mid-1960s, the decline of tank car loadings eventually produced deficits in mileage allowances. This continued until the late 1980s, when a special mileage-allowance rate was written in a way that only the new M1 flatcars qualified for it. The Army also eliminated Korean War tank cars, which were expensive to maintain and rarely used, creating mileage allowance surpluses again.

The arrival of the ASMP flatcars in the 1990s threatened a return to deficits. Too ordinary to justify a special allowance similar to the M1 flatcars, ASMP flatcars qualified only for the default tariff allowance. This was eventually resolved by modifying SDDC's rail contract language to specify the mileage allowance to be paid on all DODX car types other than tank cars.

The ability to specify mileage allowances for DFRIF railcars, on general-purpose (chain tiedown and container) flatcars at least, is limited by another provision in the SDDC rail contract. This provision states that the freight rate must be the same for using a given car type, regardless of whether the car is supplied by SDDC or the railroads.

This longstanding provision of treating like cars alike, regardless of ownership, reduces empty car mileage, which in turn reduces overall costs and cycle time. If the freight rate is to be the same, then the cost of cars—whether DFRIF or commercial—should also be approximately the same. Otherwise, the railroads would shy away from using an owner's cars and the practical capacity of the railroads to carry military traffic would be artificially reduced. The increased mileage allowances for flatcars not only raised revenue for SDDC, but they also increased system capacity because they reduced variations in railroad net revenues on particular movements based on what type of cars were used.

Maintaining Railroad Transport Capacity

The usefulness of the railroad system during mobilization is another current problem. Having enough cars in the DFRIF to provide all of the capacity needed for a mobilization is a requirement only with respect to the tank-carrying flatcars. All of the other materials shipped on DFRIF cars either do not have increased demand during mobilization or have commercial rail or road alternatives to being carried on DODX cars. However, around 2000, a railroader pointed out that a commercial chain tiedown flatcar shortage was just over the horizon because most of the cars would reach their maximum interchange life within the next 10 years and there was insufficient demand to replace them all. That crisis was postponed when TTX Company, the owner of nearly all of the commercial chain tiedown flatcars, undertook an upgrade to extend their cars' interchange life, first from 40 to 50 years and then, as that age approached, to 65 years—the maximum interchange age permitted by waiver.

Meanwhile, a joint SDDC-railroad-TTX study concluded that the only feasible way to address the age issue was to have cars that were not built for chain tiedown service modified so that they could be readily used in that service. In response to a request from SDDC, TTX agreed to modify its general-purpose flatcar design to incorporate holes for a new type of chain tiedown anchor and also for interbox connectors. So far, TTX has had 400 cars built to the new design. Except for test shipments to confirm that the concept works, none of the cars have ever been equipped with chains.

A 2002 Army study concluded that enough DFRIF and commercial railcar capacity was available to sup-

port even the most extreme mobilization scenario, provided that railcars were loaded or unloaded within a day of arrival. The beginning of Operation Iraqi Freedom (OIF) in 2003 brought an opportunity to test how closely we approached that level of efficiency. Because a couple of installations had prematurely ordered and loaded commercial chain tiedown flats during the Gulf War, SDDC, at the start of OIF, required that installations order both commercial and DFRIF cars from the DFRIF fleet administrator.

An analysis of the DFRIF and commercial car movement data from the first 3 months of OIF produced an efficiency level of only 43 percent. What was worse, twice during that period, over 85 percent of all the 89-foot chain tiedown flatcars in North America were in military service. In other words, we were approaching the limits of our ability to mobilize by rail in a situation that was not, from the perspective of the planners, a large mobilization.

Part of our inefficient use of railcars was the result of the way forces were mobilized, but we had plenty of opportunity to note that efficiency in the distribution of railroad-supplied chain tiedown flatcars was not a high priority. Since then, SDDC has been working in various ways to improve the empty-car distribution process and to accelerate the loading and unloading of chain tiedown flatcars.

Railcar Future

What is in the future for the military as the operator of an owner-shipper private car line? Nothing in the history of the DFRIF or its current situation indicates that the need for the fleet will disappear in the foreseeable future. But history has shown that the need for the DFRIF can change radically in a relatively short time.

At times, the impetus for change will come from outside the military and the railroad industry. For example, the near elimination of chemical tank cars from the fleet is due in part to changes in the regulation of hazardous materials. Those changes reduced the number of tank-car cleaning facilities licensed to handle certain commodities to the point that the manufacturers had to build their own cleaning facilities to be able to continue to ship the chemicals.

Having undertaken that risk, the manufacturers, for competitive and risk-avoidance reasons, limited access to their facilities to only the cars that they owned or leased. As a result, the only chemical tank cars in the DFRIF are for specialty chemicals whose market is so limited and sporadic that manufacturers could not afford to invest in buying or leasing their own cars.

The military has benefited greatly from the chain tiedown flatcar purchases made by TTX Company in the 1960s and 1970s to carry farm implements and truck tractors—two markets that are now much smaller than when the cars were purchased. Although the need to replace them has been pushed back by life extension programs, when replacement does take place, very few cars will be bought. Putting anchor holes in general-purpose flatcars bought to serve markets that do not use chain tiedown flatcars could be an economical way to bridge the transition, but much could change in the next 20 years.

The Army has never routinely replaced or expanded the DFRIF's general-purpose flatcar fleet. Its first purchase was tied to the fielding of the M48, the second to the development of the M1, and the third to the desire to get to war faster. The M1 flatcars will need to be withdrawn from use or undergo a very expensive rebuild beginning in 2029. Whether or not another "important" program will come along to fund that replacement or rebuild is questionable.

Events since 2000 have led SDDC to become more involved with the military's use of commercial chain tiedown flatcars. Since 2003, SDDC has acted as an intermediary between shipping installations and the railroads in requesting commercial cars. Initially, SDDC simply acted as a gatekeeper to restrict the premature commitment of the cars. Over time, however, SDDC and the railroads have gotten used to working together to provide the cars that make the most sense to use.

In 2004, SDDC testified for the first time in support of the antitrust exemption that permits TTX Company to operate a pooled chain tiedown flatcar fleet on behalf of the railroads that own it. Since 2005, SDDC and TTX have been working on ways to improve the efficiency of empty TTX flatcar distribution through central management of the cars by TTX, rather than through dispersed management by the individual railroads. With the objective of speeding up loading and unloading of commercial chain cars, in 2009 SDDC requested that the Federal Railroad Administration recognize the right of commercial owners of cars capable of carrying chain tiedown loads to eliminate handholds that project above the cars' decks so that they can be loaded and unloaded as fast as DODX chain tiedown flatcars.

Railroads have been essential to transporting military materiel since the Civil War and will continue to be important in the foreseeable future. Maintaining an inventory of available railcars for moving military weapon systems and equipment is an ongoing concern for SDDC. Determining what types of cars are needed, who owns them, and how to fund their purchase and maintenance requires a communication network among SDDC, the services, the railroads, and TTX Company in order to ensure that they can provide the railroad support the services need when they need it.

George Gounley has managed the Defense Freight Railway Interchange Fleet since 1985.

The Army Band Officer Lifecycle

BY LIEUTENANT COLONEL JIM R. KEENE

A small contingent of commissioned Army band officers lead elite units that use music to support the Army's mission.

Army band officers, specialty code (SC) 42C, are indeed rare in the Army's officer corps. In fact, there are fewer Army band officers than Army astronauts. With only 22 authorized and 23 assigned Army wide, they represent a tiny but important portion of officers in the Adjutant General's Corps and an even smaller percentage of all Army officers. Officers who hold SC 42C must have a high degree of subject-matter expertise in leading and conducting musicians. They are commissioned in a single-track specialty specifically to lead the Army's finest musicians in support of echelons above the corps level.

Most Soldiers are more familiar with Army band commanders who are warrant officers in military occupational specialty (MOS) 420C. This is because warrant officers lead 27 of the Active Army's 33 bands, all 17 Army Reserve bands, and 53 Army National Guard bands. Warrant officer band commanders typically serve in the bands assigned to the headquarters of corps, divisions, and the Army Training and Doctrine Command, and other installations.

Although typically assigned to the most senior headquarters of our Army and Nation as single-track band officers, they are Adjutant General's Corps officers and compete for promotion in the Army's

An Army band officer conducts the U.S. Army Hearld Trumpets at a free concert in Atlanta, Georgia. *(Photo by SPC Brian Bohannon)*

competitive category. Although competing for promotion with the rest of the Army, all band positions must be filled by an officer holding the SC 42C, and each "special band" commander position is an appointed post.

Special bands include the U.S. Army Band ("Pershing's Own"), the U.S. Army Field Band (the Field Band), and the U.S. Military Academy Band (the West Point Band). [The U.S. Fife and Drum Corps is also a Special Band but is commanded by a warrant officer.] Like other Army assignments, commanders typically hold these positions for 2 to 3 years. Ideally, each assignment provides the officer opportunities for increasing levels of responsibility, which result in general and specific preparation as they ascend through the ranks.

A Recent History of Band Officer Assignments

Since the early 1970s, the total number of Army band officers has not exceeded 26, but the types of assignments available to them have changed. Through the early 1990s, Army band officers also served as "staff bands officers" at the headquarters of U.S. Army Europe, the Army Forces Command (FORSCOM), TRADOC, and in each of the six continental U.S. Army headquarters' staffs. As of 2009, only one staff bands officer position remains, at FORSCOM headquarters.

The newest SC 42C assignment, the entertainment programs officer to Multi-National Corps-Iraq (MNC–I) was established to—

- Monitor the number of Army bands arriving in theater.
- Coordinate band activities with broader theater-level Army initiatives, including morale, welfare, and recreation and United Service Organizations events.
- Assist the bands in solving logistics, communication, and administrative problems in theater.

Many Army bands that have served since the beginnings of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) have provided ceremonial, morale, and funerary support to units and headquarters of other Army formations, U.S. and international agencies, and their own division or corps activities. As a result, officers in this assignment are also providing a steady stream of lessons learned on how best to manage Army bands' missions in a multinational environment.

The Band Officer Lifecycle

Typically, only one or two new officers are needed per year to maintain the band officer corps. Commissioned officers are expected to have substantive experience leading musicians before their audition and selection as Army band officers. A master's degree in music is standard, but not necessarily required as long as the candidate displays a high level of competence and practical experience in leading professional musicians.

The audition. Army band officer auditions are rigorous and competitive and include an audition on the applicant's main instrument, a music theory exam, a personal interview, and a live audition to evaluate the applicant's ability to conduct an ensemble. During the live audition, the applicant directs both a concert band and a chorus from Pershing's Own or the Field Band.

Officer Candidate School. After the Army band officer board (staffed by senior Army band officers) selects a candidate, the applicant also appears before an Officer Candidate School (OCS) selection board. Band officers' accessions come primarily by OCS. This 14-week course at Fort Benning, Georgia, is designed to train individuals with college degrees to be Army officers. Those who are selected as civilians must successfully complete basic combat training before attending OCS.

Lieutenants. Most Army band officers are older (on average, 27 years old) than typical new Army officers (23 years old) because of the expected level of civilian education and experience needed to be accepted as Army band officers. Generally, the career path begins as a second lieutenant. At the U.S. Army School of Music (USASOM), officers are trained in Army common skills tasks, key branch skills, leadership, public speaking, ceremonies, and unique Army music skills. Lieutenants are provided maximum practical experience through assignments to Army bands. Although this period is developmental in nature, a young band officer routinely may be tasked to interact with senior leaders and lead ensembles consisting of world-class musicians for large audiences and high-level dignitaries at national and international events.

Captains. Ideally, prior to command, captains attend a captains career course at USASOM, where they study the Army's core training, music programming, public speaking, briefing to influence, audience demographics, and advanced music and performance concepts. Captain is the first rank at which officers have the opportunity to command a band, teach at USASOM, or serve as an associate conductor or bandmaster in charge of a chorus, pop ensemble, or ceremonial unit from Pershing's Own or the Field Band.

A captain may serve as commander of the TRADOC or FORSCOM band or School Company at USASOM. Key staff experiences are available at the FORSCOM Staff Band Office, at USASOM as an instructor, and through the recently developed deployed position in Baghdad as the Entertainment Programs Officer for MNC–I.

Officers gain advanced leadership experience during this phase of their careers. Their rating schemes can be as unique as their professional experiences. Often, a captain commanding a band will have a rater who is a colonel and a senior rater who is a lieutenant general. As a captain, a band officer will have multiple opportunities to lead world-class musicians for audiences in auditoriums from small-town America to the White House.

Majors. A major may serve as commander of the U.S. Army Europe Band and Chorus in Germany, as the deputy commander of the West Point Band, or as

the deputy commandant and director of training at USASOM. He also may serve as the executive officer of Pershing's Own.

As a major, band officers must complete Intermediate Level Education either in residence at the Army Command and General Staff College at Fort Leavenworth, Kansas, or through a 13-week satellite course and nonresident advanced distributed learning program at Fort Belvoir, Virginia; Fort Lee, Virginia; or Fort Gordon, Georgia. Majors may also complete the Advanced Operations Warfighting Course.

Lieutenant colonels. As a lieutenant colonel, a band officer may serve as the commandant of USASOM, commander of the West Point Band, or deputy commander of Pershing's Own or the Field Band. Army band officers with the rank of lieutenant colonel compete for senior service college education and training on the same basis as all other competitive category officers.

Colonels. The positions available to band officers include two colonel slots: commander of Pershing's Own and commander of The Field Band. In addition to serving as commanders of these elite organizations, colonels provide leadership and subject-matter expertise to the Chief, Army Bands (the Adjutant General School commandant), regarding officer assignments and policies and procedures relating to Army bands.

Future Considerations for Band Officer Careers

The inactivation of the six continental U.S. Army headquarters, the elimination of staff band officer positions at the Army Human Resources Command, U.S. Army Europe headquarters, and Army Training and Doctrine Command headquarters limited programmatic opportunities for company-grade and field-grade Army band officers to experience effective management of policy and logistics issues affecting Army bands. The only pure staff positions for band officers exist at FORSCOM headquarters, where the staff band's officer monitors and assists in the operations of bands assigned to divisions and corps, including mobilization and Reserve component issues.

Assignment to USASOM also requires company- and field-grade officers who are familiar with Army training and resource management as well as training and doctrine development. Senior officers, specifically the commandant of USASOM, are expected to provide vision and leadership in constructing training and doctrine for all Army bands.

Given the nature of the expeditionary Army, Army band officers may need to pursue graduate education and training-with-industry opportunities in related fields like international relations, music marketing, entertainment production, and multimedia communications. The new SC 42C assignment to MNC–I is one important step toward filling an immediate Army requirement that offers commissioned band officers their only opportunity to serve in a forward-deployed environment.

Army band officers today are limited to assignments in one of only nine units.

Grades	Special Bands
O2–O6	The U.S. Army Band (TUSAB) Fort Myer, Virginia
O2–O6	The U.S. Army Field Band (TUSAFB) Fort Meade, Maryland
O3–O5	The U.S. Military Academy Band West Point, New York

	Army Band (Large)
O3–O5	U.S. Army, Europe (USAREUR) Band and Chorus, Germany
O3–O4	Army Training and Doctrine Command (TRADOC) Band, Fort Monroe, Virginia
O3–O4	Army Forces Command (FORSCOM) Band Fort McPherson, Georgia

	Staff
O1–O5	U.S. Army School of Music (USASOM) Virginia Beach, Virginia
O3–O4	Entertainment Programs Officer Multi-National Corps-Iraq
O3–O4	Staff Bands Officer, Headquarters, FORSCOM Fort McPherson, Georgia

Leaders and developers in Army bands are considering other developmental experiences and training designed to rebuild the skills and understanding needed to function effectively in strategic-level assignments.

As a part of the working force design update for Army bands, there may be a need to rebalance warrant officer and commissioned officer positions to provide an improved officer career progression model and to lend balance and standardization to the operational force.

As the Army continues in an era of persistent conflict, units like Army bands need skilled leaders who grow in and relate to the Army's culture and system. These leaders will continue to provide world-class musical organizations that are uniquely able to communicate through music on both national and international stages to strengthen both the will and reputation of America's Army. These specialized officers, from second lieutenant through colonel, will continue to seek the widest possible range of skills and experiences to lead Army bands as they continue to transform in the future.

Lieutenant Colonel Jim R. Keene was the commandant of the U.S. Army School of Music when he wrote this article. He is now the commander of the U.S. Military Academy Band at West Point, New York. He holds degrees in piano performance and orchestral conducting.

Making Training Development Processes More Efficient Through Lean Six Sigma

BY DONALD D. COPLEY, JR.

In July 2009, the Army Soldier Support Institute (SSI) hosted an Army Training and Doctrine Command (TRADOC) accreditation team. The Recruiting and Retention School (RRS) had just completed a Lean Six Sigma project on training development and identified a new process for developing training materials and lesson plans. The TRADOC accreditation team identified RRS's innovative, streamlined process as a best practice during its visit to SSI. This article describes how RRS used technology to develop training for a geographically dispersed command while minimizing the impact on training delivery in a rapidly changing environment.

As SSI strategically plans for Army Force Generation (ARFORGEN), RRS has developed innovative, creative, and adaptive methods to generate course materials, process change requests, and maintain audit trails for accreditation purposes. RRS has been very successful in streamlining the training development processes and enhancing the ARFORGEN relationship among institutional, organizational, and self-development training domains. RRS offers a dynamic, streamlined training development process, innovative training solutions, and the integration of multiplatform systems for single-source documentation management.

In recent years, RRS has struggled with decreasing resources and a smaller workforce. So, in February 2008, the school's commandant sent the director of training to the Army Lean Six Sigma course at Fort Jackson, South Carolina. The instructions from the commandant were simple: get trained and launch a study on how to streamline the training development processes. With a training development team (TD shop) of 10 people, including 8 civilians and 2 Soldiers, RRS developed the training materials for 16 functional courses that had to be relevant to the ever-changing recruiting environment.

The project was launched in March 2008 and was completed just before the TRADOC accreditation visit in July 2009. During the final accreditation briefing, the accreditation team recognized the RRS TD shop as the most innovative, motivated, and dedicated training development team they had seen in over 30 years. The lessons learned from the RRS Lean Six Sigma project can be shared by all Army schools.

Applying Lean Six Sigma to Training Development

The RRS TD shop established a charter and immediately designed a SIPOC [supplier, input, process, output, and customer] model of the current training development process. Once the process was defined and properly scoped, the director of training brought in five of the TD shop's customers, the RRS cadre instructors.

The instructors were given a quick briefing on the process and were asked what was important to them. All five agreed that a training developer's most important tasks are lesson plans, multimedia products, examinations, and any homework or practical exercises used in class. When asked why these tasks are so important, the instructors shared that they cannot stand to be embarrassed on the platform with bad test questions, outdated training materials, and grammatically incorrect documents. They did not know what audit trails, critical task site selection boards, Training Requirements Analysis System (TRAS) documents, and quality assurance procedures were. They simply wanted quality, relevant products.

Once the cadre clearly defined the voice of the customer (the critical customer requirements), the TD shop documented the voice of the business (business requirements, regulatory guidance, organizational leaders' desires, and TRADOC mandates). The team briefed the RRS commandant and deputy commandant, Colonel James Comish and Lieutenant Colonel Alfonso Mandujano, Jr. The briefing revealed that the commandant expected the TD shop to update all 16 courses and make sure the material was as relevant as possible—and do so with only the 10 personnel already assigned to the TD shop.

The team was given complete autonomy to create a process that would satisfy both the customer and the business requirements. As the team moved forward, they had to capture the current processes and determine how well they were performing.

To gauge current process efficiency, the TD shop designed an evaluation sheet for the products developed by the process. The five products the team reviewed were critical tasks, lesson plans, multimedia, practical exercises and homework, and examinations. For each of the 5 products, the team took a sample of 30 pieces of course material and graded each of them

against the evaluation sheet. The team found that the current processes were producing products full of errors, key training management items were missing, and critical tasks were not linked to testing.

The TD shop personnel investigated each step in the process and discussed them all thoroughly. They soon realized they had too many redundant systems managing the training material development processes. They were attempting to manage all the training materials in several different software packages, including the Automated Systems Approach to Training (ASAT) and its replacement, Training Development Capability (TDC), Digital Training Management System, Microsoft Office, SharePoint, and Blackboard. The team decided it was time to streamline, standardize, and let the software packages do what they do best.

The New Training Development Process

The TD shop brainstormed and had weekly Six Sigma meetings for more than 2 months and, after several pilots and newly developed software capabilities, soon developed a new training development process.

The new process requires six steps. Step 1 is to identify change requirements. Step 2 is to update lesson materials. Step 3 is to update examination materials, as needed. Step 4 is to update or validate TRAS document changes, as needed. Step 5 is to complete a quality control and approval process. Finally, Step 6 is to notify personnel of the change or conduct instructor and key personnel training (IKPT).

Identify change requirements. No formal or informal methods had been established to identify the needed changes to course materials. Previously, instructors would make their own changes and not share those changes with other instructors or the training developers. The change requirements for RRS training materials came from a long list of contributors, and a training developer could spend his entire workday researching and looking for necessary changes and often not find the reference to document a desired change.

To address the many change requirements, the TD shop asked the cadre, staff, and doctrine writers to submit change requests. Initially, the TD shop had a difficult workload because of all the necessary changes, but after 2 years, the workload is now very manageable.

The TD shop personnel developed a SharePoint-based workflow system to accommodate change requests. This system allows field users, cadre, and Army Recruiting Command staff members to review training materials and submit change requests to help keep training material current and relevant. Because of this system, training material changes no longer lag behind doctrine changes.

Update lesson materials. The biggest gap among the lesson plans, multimedia, and practical exercises and homework was caused by the systems that were being used. Lesson plans were written on a Microsoft Word document generated from ASAT/TDC, and a separate Microsoft PowerPoint presentation was used for the multimedia, and yet another type of document was used for practical exercises. Opportunities for error were scattered throughout the process. If a developer made one change to the lesson, he had to remember to make the change in all of the separate documents.

The entire training package for a lesson plan is now developed and contained in one PowerPoint document. The team discovered that all business requirements could be added to the document to eliminate the need for copying and pasting files from Microsoft Word into ASAT/TDC. If a change occurs, the training developer simply edits one document and all changes are captured in the lesson plan, multimedia, and practical exercises and homework, thus eliminating opportunities for error.

Again, the TD shop used SharePoint, this time to control versioning, make the files readily accessible to all cadre and field users, and maintain the audit trail of the changes. SharePoint allows for maximum control, excellent audit trails, and complete sharing of course material.

The TD shop also chose Blackboard for resident instructors to use when teaching students internal (resident) or external to the institution. All lessons remain on SharePoint while instructors use the Blackboard platform for examinations, check-on-learning exercises, surveys, and homework.

Update examination materials. After creating course test plans (through SharePoint) for each of the courses, an audit trail was formed to track changes to critical tasks, knowledge, and skills. An audit trail allows a developer to have a visual representation of the test plan to ensure that all critical testing hurdles are designed and implemented.

SharePoint serves as the primary location for all test plans, audit trails, and skill-to-knowledge task matrices. This audit trail previously was not captured by any system and was often maintained on a local server or training developer's hard drive, which hindered collaborative development procedures.

A new initiative began by having the course managers migrate all testing and check-on-learning questions to Blackboard. So that an instructor can ascertain whether or not all students understand the information, instructors measure each student's learning with three to five questions at the end of every lesson. This offers a better picture of student understanding and allows cadre to better coach and mentor each student.

Update or validate TRAS documents. The next step was to ensure all TRAS documents reflected all changes made to the curriculum. It is important to "balance the check book" for training programs. The TD shop

realized that instructors were often teaching 8 weeks of training materials in 7-week courses. This was because of the tendency over time to add a small training support package or lesson plan to a course. The increase of lesson plans was not being captured, and needed resources were not being documented.

Instructors must now verify that the changes being made have not affected or altered the current individual training plan. They must also ensure that the terminal learning objectives information is current, resources are validated, and all other tabs in ASAT/TDC remain relevant. ASAT/TDC is the primary system for course administrative data and program-of-instruction development and is an excellent tool to document these requirements. ASAT/TDC does a great job of generating Soldier training publications and officer and civilian foundation standard documents. Training development personnel are required to validate that all critical skills, knowledge, or tasks remain current and relevant. These final approved documents are in the TRAS folder in SharePoint.

Maintaining a balance between the program of instruction, the training schedule, and available lesson materials is essential. These documents are maintained on SharePoint, and when changes are required because of new mission requirements, the request for change generates an approval workflow.

Complete quality control and approval. Lean Six Sigma describes quality control as waste. If you have to stop the process to ensure it is running correctly, then you have added waste to the cycle. It is better to control for errors and eliminate opportunities to create errors rather than add quality control to a process.

Given this information, the TD shop added control sheets at each of the new process steps to ensure that a training developer has a tool to gauge his work. Once the instructor meets the minimum requirements of the control sheets, he can move the documents through SharePoint workflow to be approved for publication and incorporation into the courses.

SharePoint allows for a documented approval process, which reduces the need to transfer large files through email. RRS successfully fielded this system and reduced email server requirements.Training developers now generate workflows through the system directly to the director of training. Previously, the process had three levels of quality control that required the document to be returned several times before an approval could be obtained. This process of perfection has been eliminated, and training materials are released to production with a 90-percent or higher error-free rate.

Notify personnel of change or conduct IKPT. Once the approval process has been completed and the training materials have been approved, one of two types of notification must occur. If the change is minor and requires no major adjustments to training schedules, delivery methods, or content, then the process is simple. The training developer notifies all cadre and division chiefs, through SharePoint, that a new file is posted and provides a simple write-up describing the change.

If the change is major, the training developer is required to schedule IKPT. This process allows the developer to deliver the training as designed and offer instructors a chance to ask questions or garner additional clarity if needed.

SharePoint files can be edited and an email can be sent to all members of the group to notify personnel of the change. If there are any questions or the material was changed incorrectly, instructors can still submit a workflow to address any changes that may still be needed.

The instruction for IKPT may be delivered face-to-face or virtually. If done virtually, the use of Centra Virtual Classroom is the primary tool used. When the training is delivered face-to-face, all instruction is provided through SharePoint to reinforce the use of current systems.

RRS has delivered training to over 15,000 field users through a blend of approaches, including institutional (resident instruction using SharePoint and Blackboard), organizational (synchronous virtual instruction using Centra), and self-development (asynchronous instruction through Blackboard, the Army Learning Management System, webpages, and SharePoint). This new business process allows all course material to be linked from SharePoint to all other software systems that are used for educational delivery. Virtual training sessions are easily accessible, and the new approach allows for posting homework, taking quizzes, completing check-on-learning activities, taking examinations, and participating in distance learning.

The Army is beginning to use SharePoint at an enterprise level. SharePoint allows schools to share and communicate training products, so all organizations should consider it and take a new look at some old problems.

The key capability development from TDC is the ability to have one standardized process across TRADOC for TRAS development, management, and sharing. RRS has developed a process using current Army enterprise systems, and it shares all files with field users, other institutions and schools, higher headquarter elements, and staff principles. TRADOC TRAS managers, training developers, and distance learning managers could easily adopt these processes.

Donald D. Copley, Jr., is the director of training and personnel development at the Army Recruiting and Retention School at Fort Jackson, South Carolina. He holds a bachelor's degree in marketing and master's degrees from Webster University in human resources management and human resources development.

From the Swamp to the High Ground and Back

BY DR. CHRISTOPHER R. PAPARONE AND GEORGE L. TOPIC

The education and development of military logistics professionals should focus less on standard solutions to logistics scenarios and more on reflective practice.

The difficulty and complexity of the post-industrial military profession at all levels is so profound and widely recognized that it is almost cliché to mention. This is true for all specialties, but few are more challenging than the field of logistics—especially as leaders reach higher levels of responsibility. Across the vast array of administrative and operational missions and functions that extend from the Pentagon to the farthest corners of the world, the professional military logistician must be skilled in dealing with highly volatile, uncertain, complex, and ambiguous (VUCA) circumstances.

The Department of Defense's education community is working hard to meet the challenge of preparing future leaders for a high-VUCA world, including establishing several specialty schools, colleges, and universities to help shape the necessary skills. Yet curricula designers and faculty members remain challenged to move beyond institutionalized educational philosophies that are intended to drive student learning experiences.

Traditional educational design focuses on the "what"—that is, developing competency maps, determining curricula content, setting measurable learning objectives, and publishing intricate plans of instruction that are believed to control the education process. The "what" is assessed by comparing desired standards of performance to actual student performance.

Other qualitative aspects of professional military education seem to be of lesser significance, if considered at all. In many cases, the education experience appears to be focused primarily on providing students with "knowns" and applying them in the classroom or laboratory. While lessons of the past are thought to be a necessary ingredient to learning, embracing lessons learned may be dogmatic in high-VUCA situations.

In this article, we would like to open a conversation about educating logistics practitioners, focusing more on three other qualities of education: the "where," "why," and "how." Through our normative stance (by taking a "should" perspective), we hope the community of educators and senior logisticians are spurred to better appreciate what we argue are the more desirable professional qualities. To that intent, we admit we argue provocatively rather than seek to ratify the status quo. Our intent is not to suggest current practices in military logistics education have no place in the future, but that they must be subordinated to greater scopes and methods.

What may become apparent to the reader is that we use language and concepts that may very well reflect a paradigm shift. Paradoxically, while we would like to communicate to the institution using familiar language, we appreciate that an emergent paradigm cannot translate well to the one at present. At times, we will have to reframe meanings and invent new ones to attempt to communicate these ideas.

For example, throughout this essay, we will employ the metaphors of "the swamp" and "the high ground" to capture the messy reality of logistics practice and the role of education in assisting that practice. We organize the essay to talk first about the nature of working in the swamp and then about how to create learning conditions that can serve logisticians as the high ground for professional reflective practice. Our principal argument is that reflective practice is

essential to becoming a professional, yet we acknowledge that one can never quite arrive at the ideal state.

VUCA in the Swamp

VUCA is a particularly useful acronym to describe the swampy environment in which military logisticians operate. Practitioners would like to make decisions while knowing all of the variables involved in a given circumstance, but this is impossible in the swamp. In effect, they are always bound in their ability to be rational, except in rare situations where VUCA conditions would be very low—like in a very controlled simulation laboratory.

Nevertheless, a logistician can make judgments concerning the degree of VUCA present in the swamp and consider when rational-analytic (laboratory-like or scientific) approaches are appropriate. Assessing the level of VUCA associated with unique decisions or actions is a key aspect of the reflection process we propose. In that regard, we think it useful to examine what each word in the acronym means while remembering that they overlap.

Volatility. Volatility (or instability) is the degree of environmental turbulence or rate of change. Some have argued that every generation seems to think its era is the most volatile. We are neutral on this debate, but we argue that the swamp metaphor—like a bubbling, muddy, primordial mess—assumes countless dynamics at work, making it difficult to define the problem or even appreciate the situation because the context quickly morphs before we can address it.

Uncertainty. Uncertainty is the recognition that what has happened before is not an accurate predictor of what will happen later. So, pre-existing answers or solutions (including technologies) are not available and maybe never will be. The structures of the environmental domains, missions, systems, and processes we face are complex and highly interactive. In the swamp, cause-and-effect relationships are impossible to isolate from others, and the massive amount of interactive variables make assessments, judgments, and decisions about the future more like a gamble—especially when considered in a global context or over long periods of time.

Complexity. Complexity in the swamp refers to the countless events involved and the degree of interconnectedness among them that result in randomness and unpredictability rather than certainty. The higher the complexity, the less certain logisticians are that the situation can be studied in an objective way. Not every action shows immediate feedback. At best, delayed, confusing, unforeseeable side effects develop.

Studying a state of high VUCA in the swamp is like trying to study anarchy. How can you develop a framework to study chaos? Indeed, the paradox is that, by definition, no laws govern cause-and-effect relationships in anarchic systems, so outcomes are random. One can at best reflect on the circumstance—a subjective endeavor—rather than objectively determine how variables will interact. Interpreting complex situations will always result in some level of equivocation, which is our next topic.

Ambiguity. When logistics practitioners admit that they cannot be scientifically objective because of the anarchic nature of high levels of volatility, uncertainty, and complexity, their attempts at explaining what is happening in the swamp are infused with ambiguity. Mindful that multiple meanings are competing for making sense in the swamp, reflective practitioners acknowledge that expected lack of clarity. On the other hand, unreflective practitioners might have a false sense of clarity—a bias—and force the illusion of a shared understanding and seek closure rather than contemplate the almost endless possibilities of interpretations.

In the VUCA-laden swamp, reflective practitioners understand that additional information does not necessarily add clarity but often generates more questions and more possible meanings. A wealth of information creates a poverty of attention, and a poverty of attention adds even more ambiguity (paraphrasing Nobel laureate Herbert A. Simon).

Logistics practitioners should be familiar with the concept of ambiguity in daily life. Almost every word has more than one definition—and for good reason. Definitions vary across languages, editions, types, and cultures (even local or closely related social structures). Meanings are derived from context, culture, and interpretations of past events. One will likely find different definitions of the same phrase in other groups who have had different experiences and have contextualized those experiences in different ways.

Meanings are not as objective as one might think; yet, semantic history has tremendous influence on how situations are framed. Indeed, the hermeneutic method (the interpretation of others' text) to study the contextualization of the past can help gain a broader view about making sense of the present.

For example, most Soldiers have attended a meeting where the senior ranking official declares that the first task at hand is to agree to terms of reference (meaning, agree with multiple agencies and international participants in the room). In the swamp, accepting multiple, diverse meanings may benefit the collaborative "sensemaking." It may be more valuable to remain open to different meanings than to risk animosity in attempts to force agreement on terms.

In the swamp, actions must be taken and logistics must be provided. Reflection without action is useless, and action without reflection is careless. Educating the military logistics practitioner to work in the swamp is in conflict with the conventional belief that the way to that education is best determined by developing what should be taught. Such a deterministic model of educa-

tion will not be very helpful to those who have to operate in high-VUCA environments.

We need to focus much less on the "what" of education (that should occur more naturally) and more on the "where" of education (the metaphoric high ground).

Where: Structural Inertia

Our traditional structures for military logistics education seem oriented on building schoolhouses and, more recently, centers of excellence that feed practitioners knowledge that works. With few exceptions, logistics curricula designed in military schools, colleges, and universities are structured after the hierarchical system of military decisionmaking that involves a great deal of determining the "what." This system includes the top-down control of content, governance by approvals of competency maps and learning objectives (geared to a technical training culture), and formal accreditations and certifications. Hence, the curricula are mired in this structural inertia.

Although VUCA situations require customization, standardization appears to be the dominant value in terms of managing the scale of productivity in our educational institutions. The fallacy promoting such industrial-age, large-scale, production-line approaches is the assumption that situations described in the classroom will repeat in the real world. The logic is that if the student can perform to standard in the classroom, the student will apply those standards in his fieldwork—that is, in the swamp.

This is a maladaptive belief, particularly where standards of learning can become competency traps and our practitioners have to be inventive and improvisational. Thinking of the classroom or exercise scenario as the rehearsal stage for the real-world performance is a dangerous assumption; yet, it appears that a large part of the education community embraces this belief. Professor Donald A. Schön, in his seminal book, *The Reflective Practitioner*, puts it this way:

> [With an] emphasis on problem solving, we ignore problem *setting*, the process by which we define the decision to be made, the ends to be achieved, the means which may be chosen. In real-world practice, problems do not present themselves to the practitioner as givens. They must be constructed from the materials of the problematic situations which are puzzling, troubling, and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of an uncertain situation that initially makes no sense.

Educating the reflective military logistics practitioner will involve continuously deconstructing and reconstructing the "where" component of the learning function. The center of attention moves away from engineering structures to creating organic structures that permit fluid movement of practitioners to and from the seminar (the high ground for reflection) and each unique job setting (the swamp).

Emphases on deterministic knowledge solutions (sometimes euphemistically referred to as "toolkits") are diminished while "reflection while in action" becomes more prominent—in essence, the swamp becomes the "where." The "where" of education starts to blend these traditionally separate worlds; the high ground and the swamp merge. The quality of reflection (the "why") that occurs between the swamp and the high ground is vested in the critically important task of professional inquiry.

Why: Reflection as Professional Inquiry

Central to professionalizing military logistics practitioners is the shaping of their desire not only to learn but, more importantly, to strive to challenge old, accepted knowledge and create new knowledge. One thing that makes military logisticians professional is their sense of obligation to question the state of professional knowledge. Ultimately, the purpose of professional education is to help instill this sense of obligation.

We will discuss four key ideas about the "why" of educating: valuing praxis, designing (and communicating) professional inquiry, researching-in-action, and being philosophically savvy.

Valuing praxis. Inquiring and reporting around the idea of praxis—the unification of theory and practice—should be a preeminent professional value. Eighteenth century philosopher Immanuel Kant summarized this idea by saying, "Perception without conception is blind. Conception without perception is empty."

An ideal professional quality is to become an effective theorist, engaging in the imaginative process of linking interesting facts into relationships that are driving us toward a more holistic and integrative view. In short, theorizing is about presenting a larger context of how things are or could be.

Traditional students in military logistics educational programs tend to focus far more on practice (and searching for best practices) and far less on developing or debunking theories of practice, which is called "abductive reasoning."

Over the past 50 years (since the obscure publication of Henry Eccles' 1959 book, *Logistics in the National Defense*), uniformed logisticians have relinquished control of their general theory of effectiveness and allowed outside business administrators and academics to provide much of the theory that military logisticians study. Part of the ideal state of military logistics education would include continuous updating of a general theory of military logistics.

Central to professionalizing military logistics practitioners is the shaping of their desire not only to learn but, more importantly, to strive to challenge old, accepted knowledge and create new knowledge.

Designing professional inquiry. The profession offers opportunities for intrinsically motivated logisticians to become confident in how to approach inquiry and report outcomes with rich descriptions and concise summaries, both conversationally and in written form. The conversational form can be described as "consultative stewardship" and is a skill that delivers coaching, guidance, direction, and assessment. With this skill, professionals engage in substantive discussion and debate with peers, subordinates, and superiors.

Professional inquiry is important both in the realm of divergent knowledge (exploring the unknowns) and in confirming or denying assimilative knowledge (readdressing or challenging the knowns). Both of these reasons for inquiry are important for addressing the perpetual issue of avoiding professional myopia or a competency trap. As sociologist Gianfranco Poggie said, "A way of seeing is also a way of not seeing." The current state of the profession may indicate blindness to the value of consultative stewardship.

Researching-in-action. The best professional practitioners could ideally be described as researchers-in-action. They develop innovative and improvisational ways to design logistics while working, rather than using mechanistic templates (techniques or best practices) learned in the conventional classroom that assume a near-context-free application.

Inquiry developed between the swamp and the high ground should not emphasize completeness, and plans should be considered works-in-progress that are never quite complete. Such inquiry does not seek closure but rather openings to unexpected possibilities. Military logisticians should aspire to understand the value of both qualitative and quantitative research, the limits of using applied science techniques in logistics, and the importance of appreciating when to employ abductive reasoning (better for high-VUCA situations) instead of deductive or inductive reasoning (better for low-to-moderate-VUCA situations).

Abductive reasoning involves the discovery of tentative inferences and search strategies for possible explanations. Surprise is the trigger of abductive reasoning, so it goes hand-in-hand with being a practical skeptic about one's belief system. According to Herbert A. Simon (in his seminal 1973 article "The Structure of Ill Structured Problems" in the journal *Artificial Intelligence*), such critical inquiry needs a blending of luck, persistence in search, and superior heuristics.

According to modern-day philosopher Nicholas Rescher, our sense of luck involves appreciation of chaos (small changes can lead to amplified effects), the unpredictability of others' choices, the nature of chance (the unruliness of things happening), and our own ignorance (consisting of both fallacies in interpreting information and a lack of information). Despite the resulting randomness in everyday life, we can still abductively reason, which is more of an attitude than a methodology.

Abductive reasoning theorists argue that much of our creativity involves extending what we already know. We borrow meanings from a wide assortment of experiences and learn to cross lines between knowledge disciplines (sciences and humanities) to make sense of novel situations. To reason abductively requires an open search strategy that includes having a disciplined conversation with oneself, collaborating with others who have varying views, calling on past experiences that can be synthesized and evaluated as hypotheses for taking action now, and extending and displacing old concepts until useful meanings are discovered for the situation at hand.

Recall Archimedes' shouts of "*eureka*," from the Greek verb, *heuriskein*, which means "to find out." Superior heuristics (from the same root word) involves creativity in reframing, finding rules of thumb, analogies, metaphors, similes, and histories that may relate to making sense of the situation at hand. The reflective logistics practitioner expects surprise as he abductively reasons about the emergent reality. An eclectic career path and multidisciplinary educational opportunities provide the practitioner superior heuristics when dealing with high-VUCA situations.

Education should involve coaching students to be researchers-in-action as they encounter problems of the real world. Students should treat their past field experiences in the swamp as hypotheses for action, not as proofs for action. Academic study should be oriented more toward learning about the philosophy behind the practice of abductive reasoning. Crossing over into nonlogistics fields of study, including liberal arts, has tremendous value. Such studies serve as creative sources for heuristics and exercising professional judgment when faced with high-VUCA situations.

Traditional models of military logistics education focus on students being able to recognize situations and know what to do. Our proposed philosophy assumes practitioners will be making sense of novel situations, inventing what to do as they are doing it, and reflecting on the situations as they are happening and in retrospect.

Being philosophically savvy. Military logistics practitioners should strive to become philosophically savvy. That is, they should strive to remain open to ideas while being critically mindful enough not to succumb to (paraphrasing philosopher Lewis Feuer) clichés, catchwords, placards, parades, slogans, ideological clubs, circles, peer and populist unsubstantiated influences, orthodoxy, and overreliance on technique.

Professional military logisticians have to be sophisticated enough to recognize and resist anti-intellectualism, dogmatic beliefs, cultural biases, and ideologically-based influences and to deal effectively with inconvenient facts that may contradict prevailing beliefs. We need military logisticians who can engage in critical reviews of otherwise popular or unexamined arguments in military, academic, and contracted studies.

For example, professional logisticians should routinely challenge the wisdom of popular management books that uncritically espouse the worthiness of fads, such as Balanced Scorecard and Lean Six Sigma. We also need professionals who embrace well articulated arguments, scholarly work, the statements of talented and insightful thinkers, and those who respect fellow professionals despite rank and positional differences.

How: Connecting the Swamp and the High Ground

Rather than educating through episodic classroom experiences that are separate from actual practice in the field, the logistics community has to find ways to merge the two experiences. Perhaps educators should use a virtual seminar on the Internet while injecting short (maybe 2- or 3-week) small-group sessions over a period of years. Real-world experiences should serve as opportunities for a practicum, and the educator should be the coach and discussion facilitator along the way.

Educational programs should be redesigned to use the cohort seminar as an opportunity to go to the high ground. Students should move themselves from the immersion of day-to-day problems at work to a temporary vantage point where group members help each other reframe their situations and participate in designing a way ahead.

Taking advantage of the high ground involves collaborative thought experiments and adapting to the situation at hand when no technical solution seems to work (i.e., creating divergent knowledge). The purpose of the cohort seminar, then, facilitated by the logistics educator, is to explore through dialog and inventively create divergent forms of knowledge as a group. The students return to work with a refreshing view and equipped with new insights and images of their mission.

Some in the defense community may prefer using the case study or scenario method in the classroom. Instead of students bringing their swampy experiences to the classroom, the more traditional scenario method is to present well-developed and detailed case studies that are intended to help the students become better problem-solvers.

Criticisms of the scenario method are many. First, case studies tend to be developed around preconceived themes and theories of action that provide opportunities for deductive reasoning (developing solutions from a potentially illusive framework, such as military doctrine). Few, if any, opportunities exist for theory building and testing-in-action (which are associated with abductive reasoning). Under the swampy conditions of high-VUCA situations, abductive reasoning is the preferred skill. The benefit of using real up-to-date situations (that are indeed messy) is that students are required both to criticize prevalent theories or doctrines that appear irrelevant and to promote the ongoing design of new theories.

Second, scenario-based exercises imply that there are context-free lessons to be learned. That is, one assumes the conditions will repeat in the real world and the students will now be familiar with them. But Soldiers are unlikely to experience exactly the same logistics operation over and over again. In high-VUCA, real-world, military logistics situations, the logistics scheme cannot be static, so knowledge of military logistics must always be transforming.

The traditional search for historic lessons learned must be continuously evaluated, and efforts have to be taken to unlearn them; the knowledge of military logis-

tics is, and has to be, ephemeral. History's greatest role in military education is to confirm that every operation is unique. While the context provided in case studies can never match the context that recent student experiences provide, history serves to be a rich source for building heuristic depth in practitioners.

Third, scenario method learning reinforces the idea that we can find root causes and define problems through analysis and other forms of scientific reductionism. In highly complex, interactive situations, practitioners may at best appreciate the unique situations they are in. Appreciation is making subjective judgments of fact about the state of the whole system. It is a view of oneself and one's organization as part of a larger enterprise in an even larger global context.

Unlike case studies, where causality can be more clearly determined in retrospect and aspects of causality appear isolatable, projecting on the current situation is better stated as an exercise of "retrospection anticipated in fantasy" (as social philosopher Alfred Schutz says in his *Collected Papers*). One should seek to twist this abductive reasoning idea with this maxim: "If you set out to invent the future now, you are not inventing the future; you are instead being inventive in the present." This is a much greater skill than untangling historic case studies into neat, oversimplified, proximately causal terms.

Studying history is not the problem. On the contrary, we advocate a detailed approach to studying history. Our objection is about how cases are designed and biased toward proving a point or developing scientific techniques. These are illusory goals. We advocate affording practitioners the opportunity to go to the high ground in the midst of their day-to-day struggles in the swamp, where no one knows how things will turn out. Educating military logistics practitioners should be more about reflective practice than the deterministic search for best practice.

In the face of high-VUCA conditions, traditional educational structures for military logisticians are maladaptive because they focus on the "what." Our goal in this essay is to suggest the need to deconstruct and restructure our conceptualizations of education toward the questions of—

- Where: Reframing education away from the locus of deductive reasoning and standardized "technical" structures toward more abductive reasoning and contextual, adaptive, sensemaking opportunities.
- Why: Orienting on praxis, designing, researching-in-action, and philosophical knowledge.
- How: Creating a cohort-based seminar approach that continuously connects the swamp to the high ground.

Given these concepts of logistics education, a collegial body of reflective practitioners can opportunistically create emergent and often ephemeral forms of knowledge that, under high-VUCA conditions, are more important than knowing "what" the military logistics community already knows.

The most significant ingredient in this transformation must be a renewed emphasis on the quality of educators as facilitators of the proposed reform—particularly to foster abductive reasoning skills in practitioners. In their role as ongoing seminar facilitators, these carefully selected educators should be, above all, highly skilled in shaping the conversations and creating opportunities to gain perspective on the swamp from the high ground.

The focus of the senior educational administrator is no longer on controlling the content (the "what") but on ensuring that cohort seminars are resourced in the form of excellent faculty, well-designed seminar rooms, and opportunities for virtual seminar experiences as needed. The quality of the connections among the members of these proposed collaborative groups depends on these resources and those expert facilitators.

Our defense logistics schools, colleges, and universities must shift attention from seeking context-free knowledge ("best practice" or technical knowledge) to facilitating context-rich knowledge (the realm of reflective military logistics practice). Traditional models of military logistics education focus on students being able to recognize situations and know what to do. Our proposed philosophy assumes practitioners will be making sense of novel situations, inventing what to do as they are doing it, and reflecting on the situations as they are happening and in retrospect.

The swamp/high ground approach to education will provide a cohort venue in which the practitioner can become more professional. We recognize the tremendous challenges—intellectual, structural, and resource—that such a shift would entail within the Department of Defense educational enterprise. Some people will have reasons why we cannot or should not change our traditional approach, and many will not entertain even experimenting with a new method. However, in the high-VUCA world, it comes down to a single inescapable question: What educational philosophy will help professionalize our logisticians?

***Dr. Christopher R. Paparone** is an assistant professor in the Army Command and General Staff College's Department of Joint, Interagency, Intergovernmental, and Multinational Operations at Fort Lee, Virginia. He is a retired Army colonel and has a Ph.D. degree from Pennsylvania State University.*

***Colonel George L. Topic, USA (Ret.),** is the vice director in the Center for Joint and Strategic Logistics at the National Defense University. He served as a Quartermaster officer for 28 years on active duty and for 3 years as the deputy director for strategic logistics on the Joint Staff.*

Advice to a New Sustainment Planner at the Brigade Command Post

BY KENNETH LONG

The author provides a working list of questions that planners need to answer to ensure that they are meeting the needs of the unit. This list offers guidance for company-grade officers and noncommissioned officers coordinating the military decisionmaking process at the brigade command post.

On receipt of a mission, or at the hint of a new warning order, and periodically throughout the day, a sustainment planner at a brigade command post should coordinate with fellow staff officers in the warfighting functional cells to define the scope of the mission at hand. This article presents a list of questions and considerations that I have found useful when supporting conventional operations. The list represents the wisdom of many years of support operations experience. The questions are designed to keep you, as a sustainment planner, anticipating mission requirements so that you are forecasting sustainment needs and not reacting to maneuver planners.

These are questions that I would advise captains, lieutenants, noncommissioned officers, and Soldiers in the command post to answer. Remember: Soldiers are sergeants in training *right now,* so leaders should be educating them right now.

S–1

In addition to acting as the commander's adjutant, the S–1 coordinates with the unit surgeon to pull together planning considerations affecting personnel- and strength-management plans. The S–1 must be cross-trained in the S–4's functional areas in order to provide sound and timely advice and ensure that personnel support and logistics support are integrated.

1. What is the flow of unit personnel into the theater, including at the aerial ports and seaports of embarkation and debarkation, and what is the flow capacity at each location?
2. What are the personnel reception, staging, onward movement, and integration requirements in theater, to include training and accountability?
3. What is the casualty estimate forecast by event and battlefield location?
4. What is the casualty evacuation management plan?
5. What are the current unit strengths and military occupational specialty (MOS) shortages?
6. What is the status of crew manning in pacing items?
7. What are the personnel replacement transportation requirements in the unit area of responsibility?
8. What are the postal transportation requirements within the unit?
9. Have we established coordination with the Army airspace command and control (A2C2) staff officer?

Medical Operations

Rehearse the planning process with the brigade combat team's (BCT's) entire medical support team—the BCT S–1, the surgeon, the support operations officer and his medical planning officer, and the brigade support medical company commander, who is the executor of the BCT plan. The medical company commander should have a close relationship with the medical platoons of the battalions in order to provide seamless and effective casualty evacuation. Nurture this relationship in garrison as well as the field.

1. What is the priority of support?
2. What is the availability of ground and air assets?
3. Is the command and control and support structure in place in the theater?
4. What is the local infrastructure like?
5. What are the rules of engagement for supporting non-U.S. patients?
6. What are the casualty estimates and the requirements for nonstandard evacuation?
7. What are the protocols for reacting to mass-casualty events?

8. What are the plans for ambulance exchange points, forward surgical teams, and aid stations throughout the area of operations?
9. What is the plan for clean and dirty routes?
10. Where will you position air assets and Army airspace command and control?

S–2

It is a good idea to identify a rear-battle subject-matter expert in the S–2 shop who can focus on threats to the brigade support area and lines of communication. You want an expert in the main command post focusing on special considerations for the rear area threat so that, as message traffic or spot reports come in, he can immediately be alerted to the impact on rear operations. The primary S–2 officer is probably too focused on the main battle area to satisfy this need. Have this S–2 rear area subject-matter expert present the threat briefing at the sustainment rehearsal and cultivate this relationship. Here are some specific questions to coordinate with him:

1. What are the threats to sustainment throughout the battlespace?
2. Does the threat prioritize attacks by phase against sustainment assets?
3. What is the status of the current threat capability portfolio, and how dynamic is the status?
4. When is the next S–2/G–2 rear area threat profile with overlays being published?
5. When is the next scheduled operations and intelligence information transfer to the administration and logistics radio network?

S–3

As the terrain manager, command prioritizer, and concept of maneuver designer, the S–3 is an important sustainment planner. Here are some questions and coordination points to engage him and his staff:

1. What are the possibilities and probabilities for exploitation, and what are the triggers and battlefield conditions that would cause us to make the decision to exploit?
2. What are the initial concepts for positioning battalion-sized elements, and has the space been allocated for the brigade support area, logistics elements, unit maintenance collection points, and ambulance collection points?
3. Do we have the latest list of working fragmentary orders (FRAGOs)?
4. What branches and sequels are anticipated?
5. What "be prepared" missions are anticipated?
6. Are there any emerging ideas for the concept of maneuver?
7. How dynamic is the mission profile of the next higher headquarters, and how quickly could the mission forecast change?
8. Where is the unit in its higher headquarters' priority of support?
9. What task organization changes are anticipated, and are they absolutely essential for this mission? (Remember that each task organization change requires some changes to the support forces that must be cross-leveled as well. Anything other than the standing operating procedure is problematic.)
10. What are the criteria for transitioning to a new phase of the operation in terms of battlefield status?
11. What is the status for A2C2, and when was the unit's last rehearsal?
12. What is the required rate of supply for ammunition?
    - ❏ Are there any DODICs (Department of Defense identification codes) that are or need to be command regulated?
    - ❏Who is the release authority for command-regulated ammunition?
13. How complex is this mission?
    - ❏How many moving pieces are there?
    - ❏Where are the key spots on the ground for leaders?
14. Are there any chokepoints that are crucial to the mission?
15. Are forces allocated to the tactical combat force, and what is the plan for the military police?
16. What is being considered for the reconnaissance and counter-reconnaissance fights, and how will we use the reconnaissance, surveillance, and target acquisition battalion?

S–4

You may be the S–4 or the SPO planner asking all of these questions of others. You should be mindful of the following:

1. How many and what type of current missions currently are being supported or planned?
2. What is the combat power now, and what is the combat power forecast for the next 6, 12, and 24 hours?

3. What is the current status for class III (fuel), class V (ammunition), class VIII (medical materiel) and class IX (repair parts), and what is their forecasted status for the next 6, 12, or 24 hours?
4. Is the unit doing anything unusual with sustainment right now? In the next 24 hours?
5. To what degree are unit capabilities currently engaged?
6. Where are the current and future support area locations?
7. What command and support relationship changes have taken place?
8. What task organization changes have taken place in and out of the brigade?
9. What are route management and allocation plans within the corps and division?
10. Where are the movement control teams, and can the unit support them?
11. What is the status of routes (including division and corps main supply routes)?
12. What is our priority of support in division and corps orders?
13. What is the 5-day look forward to mission profile?
14. Will the brigade support activity have to move?
    - ❏Is it moving?
    - ❏Where can it go?
    - ❏How fast can it get there?
    - ❏When will it get there and be ready to provide support?
15. Where is the forward logistics element?
    - ❏What is in it?
    - ❏What is its mission and purpose?
    - ❏Who is in charge of it?
16. What ambulance exchange points are active?
17. When did we last give an operations and intelligence update over the administration and logistics network for all sustainers?
18. What convoys are on the road, and where are they going and with what support?
19. Where are the military police and tactical combat force?
20. What is the current battle rhythm for logistics packages?
21. What is the battle rhythm of sustainment brigade convoys?
22. What air assets are available, and are any dedicated ? (A2C2)
23. How are our reporting systems doing ? (complete? timely? accurate?)
24. How good is our forecasting, and what method(s) are we using?
25. What are the brigade support battalion commander's top three concerns and his commander's critical information requirements?
26. What is our full array of capabilities?
27. Do the graphics provide the ability to quickly issue a FRAGO for anything within the area of operations and area of interest?
28. Does everyone (including the sustainment brigade supporting us) have the current graphics and daily execution FRAGO?
29. Have I talked to the SPO and brigade executive officer in the last 4 hours?
30. How can I make the plan more adaptable and provide more capabilities and choices for the commander, and how can I create opportunities to support the commander's efforts to seize the initiative?
31. Where is the next threat to sustainment coming from?
32. Where is the alternate command post right now, and could they take over the battle in a moment's notice?
33. When was the last time I slept for 4 continuous hours?
34. Who else in the brigade command post needs to know what I know?
35. When was the last time I checked in with everyone?

S–5

In an operational environment with hybrid threats, we can be sure that there will be some element of fear among the people involved. The S–5 will be pulling together many staff capability multipliers that will be available to the BCT. The S–5 is an ideal staff officer for coordinating different assets, such as civil affairs, linguists, liaisons, teams from a whole of government approach, and nongovernmental organizations that provide or receive support in the operation. The S–5 has a natural alliance with the judge advocate general officer. Creating a one-stop shop for these capabilities is an excellent idea.

1. What is the status of civilians and their effect on lines of communication?
2. What civilian lines of effort will affect our mission?
3. How can we make use of the local population and infrastructure?
4. What is the status of law, order, and discipline in the civilian population?
5. What sources of information and informal leadership can we use?
6. What are the cultural and religious symbols of importance that we must be able to recognize?

Fires

Fires is the first stop in coordinating requirements from other warfighting functional areas. The fires battalion's ammunition requirements can represent as much as 80 percent of the supply tonnage being transported through the area of operations. Their firing battery position areas compete for space on the battlefield with many of the support teams. Special coordination and planning is required to receive fires support for the lines of communication and support areas. Consider the following:

1. How much supply tonnage is forecast?
2. Who and where is the source of supply for class V?
3. Will we be firing in support of other brigades while we are preparing?
4. Will other battalions be assigned in our area for supporting fires, and if so, what is our command and support relationship with them?
5. What positioning areas do we need to support the fire mission?
6. Are there any Army airspace command and control issues that will affect our aerial resupply and medical evacuation?
7. What are the plans for out-of-sector support, if any?
8. In a defense, are there plans for stockpiling ammunition in alternate firing positions and position areas, and what is the plan for richer grade ammunition?
9. Where will counterfire radar be positioned, and what if the coverage does not include the brigade support area?
10. What is the fires threat doctrine for targeting sustainment areas?
11. Will any assets be employed in the reconnaissance and counter-reconnaissance phase?

Engineers

Engineers provide unique maintenance and support essential to the BCT's mission accomplishment. Engineer capabilities can dramatically improve the sustainment operations and survivability of the support areas and units. Keep the following in mind when planning for engineer support:

1. Will engineers be task organized to support this mission as direct support to battalions or as an independent engineer task force?
2. What is the forecast for tonnage of classes IV (construction and barrier materials) and V for this mission?
3. What is the status of preconfigured push packages in logistics support areas?
4. What are the section's special maintenance issues?
5. What is the status of materials-handling equipment (MHE)?
6. Do we have to do any repackaging of classes IV and V for this mission?
   - ❏Where will it be conducted?
   - ❏How many people and what MHE will be required?
7. Where will class V be kept in your obstacle packages, and how will that ammunition be secured and transported?
8. What assets do we have in the brigade support activity that can be used to provide sustainment protection?
9. What is the plan for improving road networks?
   - ❏What equipment is available for road work?
   - ❏What are the priorities for road improvement?
10. How will infrastructure be used to support the engineer work effort?
11. When was the combined obstacle overlay last updated and distributed?

Reconnaissance, Surveillance, and Target Acquisition Battalion

The reconnaissance and counter-reconnaissance fight is a combat operation that requires complete planning and support. In many cases, the reconnaissance, surveillance, and target acquisition battalion's concept of operation will severely challenge its ability to conduct routine resupply. Answer these questions while planning for reconnaissance and counter-reconnaissance:

1. What is the concept for reconnaissance and surveillance?
2. What is the concept for sustainment?
3. What is the plan for recovery and medical evacuation operations forward of the forward line of own troops?
4. Do we need to constitute a forward logistics element to support sustainment operations?
5. After the reconnaissance and counter-reconnaissance mission, was the follow-on mission reserve, screen, or following support?
6. What is the plan for maintenance recovery to the unit maintenance collection point in the brigade support area?
7. Will the battalion be screening or protecting in depth or along a perimeter?
8. What is the enemy's doctrine for conducting reconnaissance in waves against sustainment assets?

Financial Management

Financial management is generally an additional duty for the S–4 section. Particularly in stability operations, this staff section's concept of support will be crucial to overall success.

1. Who will be responsible for managing the brigade budget and spending plans and reporting to the division G–8?
2. Who consolidates and reviews funding requirements, and what is the process for validating the funding requirements?
3. Who will recommend spending or funding priorities to the brigade commander?
4. How many paying agents will we have in the brigade?
   - ❏ How many do we actually need?
   - ❏ Have they been trained and put on orders by the supporting financial management company?
5. Do the paying agents have a place to secure their cash (a safe)?
6. How many project purchasing officers (Commander's Emergency Response Program) and field ordering officers (local purchases) will we have in the brigade?
   - ❏ How many do we actually need?
   - ❏ Have they been trained and put on orders by the supporting contracting officer?

Take these questions and use them as a basis for obtaining the information you need to make effective decisions in the military decisionmaking process. If you have comments or improvements to this list, contact the author at long-kenneth@conus.army.mil.

Kenneth Long is an assistant professor and curriculum designer in the Department of Logistics and Resource Operations at the Army Command and General Staff College. He holds a bachelor's degree in Asian history and political science from Michigan State University and a master's degree in systems management from the University of Southern California. He is completing a doctorate of management from Colorado Technical University. He is a graduate of the Army Infantry Officer Basic and Advanced Courses, the Army Combined Arms and Services Staff School, and the Army Command and General Staff College.

Correction

In the November–December 2010 issue of *Army Sustainment,* an announcement appeared in "Headlines" concerning the Army Aviation and Missile Command (AMCOM) Environmental Hotline. The AMCOM Environmental hotline was created to resolve issues pertaining to obsolete products, hazardous material alternatives, regulatory guidance, and alternative technologies to reduce the environmental burden on AMCOM maintenance organizations.

The phone number appearing in the announcement was incorrect. The correct phone number individuals can use to ask questions about currently approved substitute materials and depot maintenance work requirements is **(256) 313–1711**.

The hotline is available 24 hours a day, 7 days a week to answer questions and requests related to aviation and missile assets. Soldiers can also ask their questions by sending a fax to (256) 955–0749 or an email to amcomenvironmental@conus.army.mil.

Radical Change Needed in Ammunition Procurement

The article in the September–October issue, "Small-Arms Ammunition Production and Acquisition: Too Many Eggs in One Basket?" was well researched, clear, and insightful. The three scenarios for analysis offered in the article are interesting as measures of the ammunition industrial base and about as good as any.

However, while single-site ammunition plants with multiple production lines, dwindling commodity suppliers, increasing cost of materials, and uncertain future demand are real problems, they should be viewed as symptoms of a problem that is worsened by poor management, lack of visionary leadership, and divergent priorities.

The Army, with Title 10 responsibility for Department of Defense (DOD) ammunition production, has created an environment with a single procurement source for many critical munitions components and raw materials (such as nitrocellulose, as pointed out in the article). The Army Material Command (AMC) over time has sacrificed funding for badly needed modernization of ammunition plant production lines and facilities, including backup systems. Ammunition plant funds have been routinely diverted to support other peacetime programs, which the authors accurately call the "peace dividend."

Over the past 20 years, while serving three command tours in munitions plants and depots, I watched AMC routinely shift funding designated to upgrade munitions production, including demilitarization production. Using the "rob Peter to pay Paul" money management method, AMC promised to repay AMCCOM [Army Armament, Munitions, and Chemical Command], IOC [Army Industrial Operations Command], OSC [Army Operations Support Command], JMC [Joint Munitions Command], and so forth, but no reimbursement was forthcoming. Because DOD is directed by law to use AMC and does not have ammunition "buying power" or alternatives for procurement, the problem continued to grow.

What is not under AMC's purview by law is the "specialty" munitions procured and managed by the individual services. In my opinion, this is because they are convinced that the Army is incapable of meeting their "special" needs and requirements. Given AMC's track record, this is a prudent move.

A holistic defense munitions operation would make munitions cheaper and production more flexible. With mass purchasing of commodities, parts, and equipment and long-life contracts for ammunition plant facilities, DOD would have the buying power to generate commercial competition, thereby increasing quality and broadening the industrial base.

The simple solution is a radical change in how we do ammunition business. In short, the Program Executive Office Ammunition needs to become a Defense organization capable of truly managing Defense needs—and this needs to happen in the real joint world governed by Title 10 of the U.S. Code, chapter 38, not another pseudo Army-joint organization like JMC. Logically, direction of munitions production should fall under the Assistant Secretary of Defense for Acquisition, Technology, and Logistics, with supply chain management going to the Defense Logistics Agency (DLA). Today, DLA provides over 80 percent of all Defense supply needs, and it does so very well at competitive prices. DLA is *the* world-class sustainment organization. However, it does not procure or manage ammunition.

The Army has done due diligence in studying the ammunition problem. However, it doesn't seem like Army senior leaders have read any of the studies. In my 20-plus years experience in munitions production, recommendations from RAND Corporation, Pacific Northwest National Laboratories, the Government Accountability Office, and the National Defense University have advocated a fundamental change in the management of our ammunition industrial base. Many recommendations have called for the privatization of the munitions production base. To be sure, some elements simply would not be profitable as a commercial single-buyer system, but that can be accounted for.

In the end, the Army (meaning AMC) has failed to implement study recommendations because AMC would lose access to easily accessed money appropriated for munitions production. Now more than ever, the need to privatize is paramount. DOD is anticipating lean budgets in the future. We must privatize munitions production or provide long-term GOCO [Government-owned contractor-operated] production contracts, and it must happen quickly.

The challenge is to break out of the old contracting model and realize that, with mandated short-term contracts, the contractor cannot be financially responsible for munitions production shortfalls. If the Army seriously addressed munitions production and production-base modernization, it would award long-term production contracts (for not less than 20 years) that allow GOCO operators to procure updated munitions production equipment and amortize that equipment over time. No manufacturer

Continued on page 69

Army Reserve Units Receive First New Line-Haul Tractor Trucks

Two Army Reserve units in Michigan have received the first of the Army's fuel and supply "prime movers" to roll off the assembly line. The 180th Transportation Company and 182d Transportation Company, both part of the 310th Expeditionary Sustainment Command, each received 60 new M915A5 line-haul tractor trucks during a first-unit-equipped ceremony hosted by the Program Executive Office for Combat Support and Combat Service Support on 29 September at the U.S. Army Reserve Walker Center in Grand Rapids, Michigan.

The M915A5 line-haul tractor truck is the "prime mover" in the Army's fleet of semitrailers and fuel tankers. In September, two Army Reserve units received the first 120 of 801 vehicles that the Reserve component will be issued. *(Photo by MAJ Jenny Griffin, 310th Expeditionary Sustainment Command PAO)*

The M915A5 line-haul tractor truck is a product of Daimler Truck North America and is the first truck of the line-haul vehicle family to come straight to units with a fully integrated armor protection package (A-kit) that is designed for peacetime and humanitarian missions. The vehicle can also be fitted with an additional armor protection package (B-kit) when needed. The B-kit armor can be installed on the vehicle in under 8 hours and provides 360-degree protection for the crew in a combat environment.

In addition to armor protection, the truck has increased power, an enhanced axle and suspension system (to handle the additional weight of the armor), two fuel tanks (to increase the distance the vehicle can travel before needing to refuel), and additional cab space for the crew, its equipment, and additional communications equipment that is integrated in the vehicle.

The Army Reserve will receive the first 710 M915A5s that were ordered for the Army. The Army has ordered 350 more of these vehicles for the active force.

Army Chief of Staff Proposes Changes to Balance the Army for a Second Decade of Persistent Conflict

During the Association of the United States Army Annual Meeting and Exposition in October in Washington, D.C., Army Chief of Staff General George W. Casey, who originated the imperative to balance the force, said that changes to the Army—the drawdown in Iraq and growing the force—have helped to improve the Army's balance and to increase dwell time. However, he said more work is needed in order to "prepare for the next decade of persistent conflict against a persistent enemy."

General Casey outlined three needs that the Army currently has: to train, reequip, and modernize the force. He said that the Army needs to regain its capability for full-spectrum combat, which has eroded because of a rapid deployment tempo that has left no time for full-spectrum training.

Lieutenant General Daniel P. Bolger, the Army deputy chief of staff for operations, plans, and programs, said that the ability to conduct full-spectrum training depends on dwell time. As dwell time improves, more training can take place.

General Casey also cited the need to reconstitute the Army's equipment, which has suffered from combat losses and excessive wear from the constant deployments. General Casey said that this reconstitution includes not only repairing the current equipment set but also building for the future by fielding the new ground combat vehicle in 7 years.

Logistics Common Operating Environment Featured in Interactive Guide

The Army Logistics Innovation Agency (LIA) has an interactive website called "The Army Guide to the Common Logistics Operating Environment (CLOE)" that aims to teach logisticians about the importance of the concept.

CLOE is the Office of the Deputy Chief of Staff, G–4, initiative to synchronize logistics concepts, organizational approaches, information, and a new generation of technologies into a single operational and technical architecture for current and future force structures. CLOE is designed to provide commands and logisticians with improved situational awareness and fleet managers of major systems with improved lifecycle management by moving logistics data from condition-based maintenance systems into logistics information systems.

LIA's interactive guide describes CLOE through easily traversable modules that explain what CLOE is, how it will be implemented, and how it fits in with other current initiatives and the joint force. To visit the guide on the Internet, go to https://lia.army.mil/cloe/.

Army Lean Six Sigma Excellence Awards Announced

The 2010 Army Lean Six Sigma Excellence Awards Program winners were honored at the Pentagon during a 16 October awards ceremony. Those recognized include the —

- Assistant Secretary of the for Army Financial Management and Comptroller, who received the Enterprise Level Project Sponsor Award.
- Assistant Secretary of the Army for Acquisition, Logistics and Technology, who received the Headquarters, Department of the Army Level Organizational Deployment Award.
- Army Materiel Command, which received the Army Regulation 10–87 Level Organizational Deployment Award.
- 21st Theater Sustainment Command, which received the Subordinate Level Organizational Deployment Award, a Black Belt, and the Non-Gated Project Team Award.
- Program Executive Office for Combat Support and Combat Service Support, which received a Master Black Belt.
- Assistant Secretary of the Army for Manpower and Reserve Affairs, who received a Master Black Belt.
- Army Communications-Electronics Life Cycle Management Command, which received a Black Belt.
- Military Surface Deployment and Distribution Command, which received a Green Belt.
- Program Executive Office Enterprise Information Systems, which received a Green Belt.

RECENTLY PUBLISHED

Army Training and Doctrine Command (TRADOC) Pamphlet 525−4−1, The United States Army Functional Concept for Sustainment 2016–2028, presents the Army's overarching vision for sustaining future forces during the 2016 to 2028 timeframe. Publication of the Army's Functional Concepts in October 2010 was the final step in the revision of the Army Concept Framework. The first two steps were publication of the revised Army Capstone Concept (ACC) in December 2009 and publication of the revised Army Operating Concept (AOC) in August 2010.

TRADOC Pamphlet 525−4−1 summarizes the key capabilities needed to integrate future Army sustainment capabilities with the joint force and to leverage the capabilities of allied, partner, and host-nation forces to ensure successful and sustained operations.

The pamphlet outlines sustainment-required capabilities for deployment and distribution, transportation, supply, maintenance, field services, operational contract support, general engineering, medical and force health protection, human resources, financial management, religious support, band support, explosive ordnance disposal, Army Special Operations Forces sustainment, and security of sustainment.

The pamphlet describes sustainment by echelon, sustainment capabilities for other warfighting functions, and sustainment capabilities that depend on other warfighting functions.

Field Manual 4−90, Brigade Support Battalion, published in August 2010, describes how the brigade support battalion (BSB) conducts logistics operations. The manual was written for BSB staff officers and noncommissioned officers and offers a summary of the functions performed by each unit and staff section assigned to the BSB.

The manual places BSB operations in the larger context of modular force logistics and sustainment of brigade combat teams and support brigades. The manual describes the organizational structure and functions of the BSB's headquarters and headquarters company and headquarters staff, distribution company, field maintenance company, brigade support medical company, and forward support companies.

- Tobyhanna Army Depot, Pennsylvania, which received the Non-Gated Project Team Award.

In fiscal year 2010, Lean and Six Sigma practitioners saved the Army $1 billion and provided another $3.3 billion in cost avoidance.

Strategic Landpower Essay Contest Announced

The Army War College and the Army War College Foundation are sponsoring the Army War College Strategic Landpower Essay Contest 2011. The contest is designed to advance professional knowledge of the strategic role of landpower in joint and multinational operations. This year, the sponsors are especially interested in essays on the application of design in conflict termination. [Design, in this case, is defined as the methodology for framing a complex interactive problem and developing a solution.]

The contest is open to the public, and essays must be postmarked by 17 February 2011 in order to be considered. For more information or a copy of the essay contest rules, entrants can send a letter to Dr. Michael Matheny, Army War College Department of Military Strategy, Planning, and Operations, 122 Forbes Avenue, Carlisle, Pennsylvania, 17013–5242, or send an email to michael.matheny@us.army.mil, or, call (717) 245–3459.

PROFESSIONAL DEVELOPMENT

New Adjutant General's Corps Courses Launched

In response to the changing operational environment and growing skill requirements for Soldiers in human resources (HR) support, the Adjutant General (AG) School has launched two new specialized courses for personnel serving in brigade S–1 sections, HR organizations, and HR staff elements. These courses replace the 4-week Human Resource Management Qualification Course and are each 2 weeks long.

The Brigade S–1 Operations Course and the Human Resources Plans and Operations Course are designed to provide the indepth technical education necessary to support warfighting commanders and the Army Force Generation process. Each course offers just-in-time-focused training for HR leaders about to step into key HR positions at the brigade and theater levels and prepares them to interpret, integrate, coordinate, and implement Army HR programs and policies.

The courses are open to Active duty and Reserve Soldiers as well as Department of the Army civilians (GS–11 to GS–13) when space is available. HR leaders who serve, or expect to serve, in brigade S–1 positions—or, for civilians, in a valid human resources management position—should seriously consider taking one or both courses.

Personnel eligible to take the Brigade S–1 Operations Course include—

- All officers with the branch area of concentration (AOC) 42 who are in the grades of captain and major and who have completed a captains career course.
- All warrant officers in military occupational specialty (MOS) 420A who have completed the AG Warrant Officer Basic Course.
- All MOS 42A noncommissioned officers in the grades of staff sergeant (promotable), sergeant first class, or master sergeant who have completed the AG Senior Leader Course.

Candidates also must currently serve in brigade S–1 positions or be pending assignment in brigade S–1 positions at the officer-in-charge, noncommissioned officer-in-charge, or technician level.

The HR Plans and Operations Course is open to all—

- Branch AOC 42 officers in the grades of captain, major, and lieutenant colonel who have completed a captains career course.
- MOS 420A warrant officers who have completed the AG Warrant Officer Basic Course.
- All MOS 42A noncommissioned officers in the grades of staff sergeant (promotable), sergeant first class, master sergeant, or sergeant major who have completed the AG Senior Leader Course.

Candidates must currently serve or have an assignment pending as the officer-in-charge, the noncommissioned officer-in-charge, or a technician in the human resources operations branch (of a sustainment brigade or expeditionary sustainment command), an HR sustainment center, a theater gateway personnel accountability team, a military mail terminal, or an HR company.

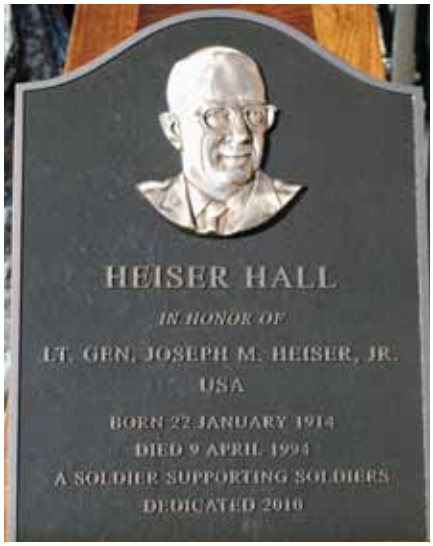
The first Brigade S–1 Operations Course graduated on 29 October; nine more classes are planned for fiscal year 2011. Seven iterations of the HR Plans and Operations Course also are scheduled. The first began on 1 November. Each course has a maximum capacity of 30 students.

These courses are in the Army Training Requirements and Resources System. Individuals interested in attending either course may email the deputy course director at michael.dean.henley@conus.army.mil or call (803) 751–8353 or DSN 734–8353.

Army Logistics University Names New Building

On 10 November, the Army Logistics University dedicated its new education building as "Heiser Hall" in honor of the late Lieutenant General Joseph M. Heiser, Jr. A veteran of World War II, the Korean War, and the Vietnam War, General Heiser served as commander of the 1st Logistical Command in Vietnam from 1968 to 1969 and retired in 1973 after serving as the Army Chief of Staff for Logistics for 3½ years.

Major General James L. Hodge, the commanding general of the Army Combined Arms Support Command and Sustainment Center of Excellence, noted General Heiser's accomplishments and his importance to logistics. "General Heiser was a professional, a caring leader, a legend in the Ordnance Corps," General Hodge said. "Accordingly, this facility is a fitting tribute to his memory. Unquestionably, General Heiser worked through his 30-year military career to improve and transform the entire spectrum of Army logistics, so this facility will continue that goal as it provides the opportunity to shape logisticians, officers and noncommissioned officers, through education and training."



The Army Logistics University's new education building was memorialized as Heiser Hall on 10 November in honor of Lieutenant General Joseph M. Heiser, Jr. *(Photos by Julianne E. Cochran,* Army Sustainment*)*

General Heiser's son, retired Colonel Joel Heiser, spoke about his father's life and career. General Heiser joined the Army in 1943 soon after the attack on Pearl Harbor. "During World War II, my father supported our operations in Europe as an ammunition officer on General [Dwight D.] Eisenhower's staff, moving from England first to support our invasion at Normandy and then into France and Germany; he was on the ground there. Five years later, he was in Korea 2 weeks after the war started."

Colonel Heiser noted that what made his father great was who he was as a human being. General Hodge said, "Ultimately, this building will provide a lasting legacy to Lieutenant General Heiser and his motto, 'A well-supported combat Soldier is the backbone of an effective Army, and it is the logistician's job to provide that support.'"

Above, this display case inside Heiser Hall commemorates the career of General Heiser, an Ordnance Hall of Fame member and a former Deputy Chief of Staff for Logistics.

At left, Colonel Joel Heiser and his wife Brigitte help Major General James L. Hodge, commanding general of the Army Combined Arms Support Command and Sustainment Center of Excellence, and Colonel Mark A. McCormick, president of the Army Logistics University (ALU), unveil a plaque naming the new ALU education building Heiser Hall.

Index of *Army Sustainment* Articles—2010

Writing for *Army Sustainment*

If you are interested in submitting an article to *Army Sustainment*, here are a few suggestions. Before you begin writing, review a past issue of *Army Sustainment*; it will be your best guide. Then follow these rules:

- ❏ Keep your writing simple and straightforward (try reading it back to yourself or to a colleague).
- ❏ Attribute all quotes.
- ❏ Identify all acronyms, technical terms, and publications (for example, Field Manual [FM] 4–0, Sustainment).
- ❏ Do not assume that those reading your article are necessarily Soldiers or that they have background knowledge of your subject; Army Sustainment's readership is broad.
- ❏ Submissions should generally be between 800 and 4,000 words. (The word limit does not apply to Spectrum articles. Spectrum is a department of Army Sustainment intended to present researched, referenced articles typical of a scholarly journal.)

Instructions for Submitting an Article

- ❏ Army Sustainment publishes only original articles, so please do not send your article to other publications.
- ❏ Obtain official clearance for open publication from your public affairs office before submitting your article to Army Sustainment. Include the clearance statement from the public affairs office with your submission. Exceptions to the requirement for public affairs clearance include historical articles and those that reflect a personal opinion or contain a personal suggestion.
- ❏ Submit the article as a simple Microsoft Word document—not in layout format. We will determine layout for publication.
- ❏ Send photos and charts as separate documents. Make sure that all graphics can be opened for editing by the Army Sustainment staff.
- ❏ Send photos as .jpg or .tif files—at least 300 dpi. Photos may be in color or black and white. Photos embedded in Word or PowerPoint will not be used.
- ❏ Include a description of each photo submitted and acronym definitions for charts.
- ❏ Submit your article by email to leeealog@conus.army.mil or by mail to—

EDITOR ARMY SUSTAINMENT
ARMY LOGISTICS UNIVERSITY
2401 QUARTERS RD
FT LEE VA 23801–1705.

If you mail your article, please include a copy on CD if possible.

If you have questions about these requirements, please contact us at leeealog@conus.army.mil or (804) 765–4761 or DSN 539–4761. We look forward to hearing from you.

LINES OF COMMUNICATION

Continued from page 61

can procure, install, and amortize their equipment under the 5-year contracts offered by AMC.

I applaud the authors for taking on this tough and sensitive topic. They provide a thorough analysis of the problem, but I don't think they address the solution. I agree that we (the Army) have placed too many eggs in one basket. However, the costs associated with ameliorating our single sources of failure are cost prohibitive. Now is the time to implement the findings of the studies mentioned above and manage what remains.

Colonel Thomas S. Schorr, Jr.
Seoul, Korea

ISSN 2153–5973
DEPARTMENT OF THE ARMY
ARMY SUSTAINMENT
US ARMY LOGISTICS UNIVERSITY
2401 QUARTERS ROAD
FORT LEE VIRGINIA 23801–1705

Official Business

**PERIODICALS POSTAGE
AND FEES PAID
AT PETERSBURG VIRGINIA
AND ADDITIONAL CITIES**

Coming in Future Issues

- ❑ Why Logisticians Fail at Knowledge Management
- ❑ Innovative Methods for Teaching Ammunition Supply
- ❑ Special Operations Logistics Support
- ❑ Rivers of Life, Rivers of Death
- ❑ Balancing MOS Competency and Warrior Task Proficiency
- ❑ Expanding Logistics Capacity
- ❑ Security Assistance From the Logistics Point of View
- ❑ Why Should I Study Military History?
- ❑ Sustainment Brigade Forward Medical Operations
- ❑ Supplies From the Sky
- ❑ Joint Multinational Readiness Center Recovery Training