THE ARMY'S OFFICIAL PROFESSIONAL BULLETIN ON SUSTAINMENT

MAY–JUNE 2015

ARMY SUSTAINMENT

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The Movement Control Gap

A Strategic Solution to Bridging the Gap in Operational Movement Control

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Deploying a CSSB to the NTC

New Alignment Enhances Training, Planning, and Resourcing

PB 700–15–03 Headquarters, Department of the Army • Approved for public release; distribution is unlimited.

ON THE COVER

A tractor trailer carries two Army humvees to Warrior Base, New Mexico Range, Republic of Korea, March 6, 2015. The truck was part of a convoy transporting equipment in preparation for Foal Eagle 2015. (Photo by Spc. Steven Hitchcock)

ARMY G–4

FEATURES

"The bottom line is that maneuver commanders should never have to worry about or be constrained by sustainment."

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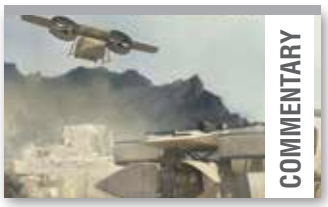

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New Alignment Enhances Training, Planning, and Resourcing

■ By Lt. Gen. Gustave "Gus" Perna

In the last issue, I outlined the importance of synchronizing sustainment efforts for the Army of 2025 and beyond. Gen. Raymond T. Odierno, chief of staff of the Army, recently helped us take a big step in that direction when he directed the alignment of sustainment brigades with Army divisions.

In short, by July, all Active component sustainment brigades will be aligned with an associated division headquarters, and Army National Guard sustainment brigades will follow suit shortly thereafter.

This is a significant decision that will have many positive results. It will ensure uniform alignment of sustainment brigades in peacetime, facilitate training, planning, and resourcing of the brigades, and improve their ability to provide direct support for divisions—very important during this time in which nine of 10 Active component divisions are committed.

Focusing on Division Support

Because of Gen. Odierno's decision, we have a great opportunity to further focus efforts on supporting divisions as we redevelop our ability to execute large-scale expeditionary operations. It is important to understand that this home-station relationship will not change the doctrinal employment of sustainment brigades for operations and contingencies.

Some will note that this new relationship appears similar to structures we had during the days of the Army of Excellence organization, when every division had a sustainment brigade called a division support command (DISCOM). There is a major difference, however.

Today's structure does not include corps support groups, the brigade-level sustainment units that reinforced support for divisions and provided direct support for nondivisional units in the corps area. Instead, division-aligned sustainment brigades will retain responsibility for supporting echelons-above-brigade and echelons-above-division units in their areas of responsibility.

In 2004, when we began transforming the Army to its modular, brigade-centric structure, we were an Army with abundant resources and predictable deployment cycles and missions.

Now we are in a period of declining resources with reduced requirements for forward operating base-type logistics and an increased need to project large formations on short notice anywhere in the world.

Meanwhile, in garrison, many of our brigade combat teams are undergoing extensive reorganization while simultaneously maintaining readiness for global employment. And our materiel management challenges are growing, not diminishing.

Sustainment commanders must meet these challenges by establishing closer ties and synchronizing efforts across their supported division staffs.

During training exercises with their aligned divisions, combat sustainment support battalions, under the mission command of sustainment brigades, will provide the capabilities that had been shifted out of divisions as part of the brigade combat team reorganization. These capabilities include troop transportation, supply distribution, bulk fuel storage and distribution, and water production, storage, and distribution.

Solidifying the Change

For sustainment brigades in Korea and Hawaii, this alignment is a big change, but for others it is less of an adjustment, since six of the 11 active component sustainment brigades have been aligned for some time with home-station divisions. However, changes to patches and unit designations will further strengthen the bonds.

Soldiers in sustainment brigades, including subordinate units, will now wear the supported division patch. Units will be redesignated so that the sustainment brigade is called a "division sustainment brigade" and is numbered the same as its supported division.

Some brigades also will change lineage and honors. Although Soldiers are rightly proud of unit lineage, redesignation is not uncommon during periods of transition.

All of these actions will help solidify home-station relationships between

maneuver and sustainment units, allowing us to identify and manage logistics talent on a broader scale, develop leaders, and increase esprit de corps across logistics formations within the Army.

The Timeline

We have an aggressive timeline to make these changes. The Army G–4 and G–3 partnered to develop implementing guidance, which was released in an execute order shortly after Odierno's guidance was published.

By the end of May, selected Active component sustainment brigades will complete mission command adjustments with their aligned divisions, change patches, and receive new unit designations.

Remaining Active component sustainment brigades will complete the transition by the end of July. Since this is a total Army effort, Army National Guard sustainment brigades are also developing implementation plans.

I appreciate the challenges associated with this transition. As a brigade commander, I had the privilege of commanding the 4th Infantry Division DISCOM during its transformation into a sustainment brigade (one of the first DISCOMs to make that transition) before deploying to a combat theater.

The transformation had positive outcomes, including greater mission capabilities, the ability to support more units across a much larger area, and an almost seamless ability to synchronize logistics operations with the expeditionary sustainment commands.

Positive outcomes will also be evident as our sustainment brigades work through this transition. Challenges will undoubtedly arise because change is difficult. Responding to the challenges will require quality leadership.

We still have to plan how we will execute materiel and distribution management. That is being worked now, and updates will be provided. The bottom line is that maneuver commanders should never have to worry about or be constrained by sustainment.

I am confident we have the right leaders and Soldiers to implement these changes and to anticipate and resolve problems. I look forward to hearing about your successes.

Lt. Gen. Gustave "Gus" Perna is the Army Deputy Chief of Staff, G–4. He oversees policies and procedures used by 270,000 Army logisticians throughout the world. Prior to joining the Army staff, he was the Deputy Chief of Staff, G–3/4, at the Army Materiel Command.

Practical Drift and Logistics Policy

Practical drift can contribute to unexpected events in logistics operations. Logisticians must be aware of this possibility and consciously work to avoid it.

■ By Dr. Christopher R. Paparone and George L. Topic Jr.

One of the questions most often asked by logisticians and military leaders in general is, "Why on earth are we doing that?" Many times the answer is unsatisfying, yet we accept and implement the guidance we are given; that is our job. On the other hand, it is our hope that this short piece will encourage readers to consider this question more deeply and not staunchly follow "rules" without questioning them.

Although obviously the entire national security policy is built—and depends—on laws, rules, policies, processes, procedures, and other guidance, it is important to understand the original reasons they were adopted. In his remarkable book *Friendly Fire*, Scott A. Snook, a retired Army colonel and now a senior lecturer of business administration at the Harvard Business School, explains the 1994 accidental shooting down of two Army Black Hawk helicopters by Air Force friendly fire as a matter of "practical drift," which is the eventual collapse of sensibility about established rules.

Snook explains that as military units rotated in and out of theater, the original no-fly-zone order's good sense, which was intended to tie no-fly operations together, ebbed as other policies and procedures were added to adapt to evolving situations.

The rules to coordinate air traffic in a no-fly zone, which included provisions to prevent fratricide, were intricate and clear in the original order. However, over time, they became less relevant as dozens of practical, more localized adjustments caused the order to drift slowly away from its original intent.

From this tragic event, logisticians can learn that incremental local deviation from rules—made over time by good people for good reason—can have dire consequences.

The concept of practical drift suggests that the innovative and improvised work practices of military logisticians can sometimes compete with the rules that regulate and account for activities in complex supply chains involving many actors and automated systems. Logisticians should understand this paradox and aggressively and continually search for ways to mitigate the tension between the competing values of innovation and control.

Rules that seem to hinder or significantly affect operations are formulated with the best intentions: to enforce good coordination, control costs, and ensure ethical practices among many actors in the supply chain. Nevertheless, practical drift in Department of Defense logistics policies and procedures occurs routinely as logisticians adapt to local conditions that perpetually change.

We recommend one idea that may help address the paradox of practical drift in the logistics community. Faced with rapid change and armed with advanced knowledge management capabilities, we submit that logistics regulatory procedures should be electronically linked to the following:

- ☐ A documented history of why the constraints or restraints were required and the context in which they were formulated.
- ☐ The staff action memoranda, with all staffing comments included, that led to the approved version.
- ☐ An online collaborative environment where questions may be asked and answers provided, facilitated by the policy proponent for those rules.

In other words, a practicing military logistician should be able to not only read to understand the larger context and original intent of the rules but also participate in near-real time in adjusting them through communication with the office that mandates them.

The current guidance for developing leaders emphasizes the ability to operate comfortably in complex situations. The Army's Leader Development Strategy asserts that "leaders must recognize that problems do not have predetermined solutions, so leader development must continue to foster creativity at every level."

However, it does not address the obvious paradox of practical drift. Set policies and procedures in essence reflect predetermined solutions. Practicing logisticians must continue to diagnose situations and, with the knowledge of practical drift, judge when to be carefully and creatively disobedient in the application of those predeterminations.

Dr. Christopher R. Paparone is a dean at the Army Logistics University at Fort Lee, Virginia.

George L. Topic Jr. is the vice director for the Center for Joint and Strategic Logistics at Fort McNair, Washington, D.C.

Under development by the Defense Advanced Research Projects Agency (DARPA), the aerial reconfigurable embedded system could resupply from sea basing assets located offshore and provide support for small contingency forces operating in austere locations. (DARPA artist concept)

Autonomous Aerial Resupply Systems Needed in BCTs

■ By Maj. Nicklas J. Van Straaten

In order to have an expeditionary capability to fight in a contested environment, the Army must decrease demands and increase logistics efficiencies and unit independence. Autonomous aerial resupply within the brigade combat team (BCT) is one capability that would meet these needs.

Unmanned aerial systems (UASs) for cargo will be a key component at the tactical and operational levels of the Army of 2025 and beyond. They will make it possible to reduce manned cargo airlifts, ground vehicle convoys, and their associated risks and deliver high-priority parts and medical supplies to remote units with no vehicle access.

The potential to reduce demand on sustainment Soldiers and automate Soldier tasks with cargo UASs is limitless. Using UASs for cargo would provide the capability to execute responsive sustainment to widely dispersed units when weather, terrain, and enemy actions pose unsuitable risk to manned air and ground assets.

This capability can reduce Soldier

exposure to risk, reduce ground distribution requirements, extend operational reach, increase delivery frequency to widely dispersed forces, decrease customer wait time through point-to-point delivery, and increase operational readiness.

Cargo UASs in the BCT

Supply convoys that operated in Iraq and Afghanistan often required air support from Kiowa or Apache helicopters. Using UASs for resupply would free up those manned aviation assets for combat missions.

According to a September 2009 report from the Army Environmental Policy Institute, Sustain the Mission Project: Casualty Factors for Fuel and Water Resupply Convoys Final Technical Report, the number of water convoys alone in 2007 was 3,725 (3,287 in Iraq and 438 in Afghanistan), which comes out to a little more than 10 convoys per day.

Having cargo UASs in the BCT, under the control of the brigade support battalion (BSB) support operations officer (SPO), would give the BCT the ability to be self-sufficient and not depend on support from external organizations. Not relying on external units would improve the SPO's ability to forecast resupply requirements for austere locations because a dedicated asset would always be available.

This is not a new concept. In recent deployments to Afghanistan, many BSB SPOs had civilian-contracted air assets at their disposal to use for personnel and cargo movements to remote locations. BCTs also already possess Raven UASs in their organizations, and airspace is coordinated and deconflicted within the brigade air staff section.

If BSBs had the ability to use cargo UASs, they could run continuous operations, significantly reduce ground convoys, and potentially reduce the number of sustainment Soldiers required for each brigade.

Future Force Aerial Resupply

A 2014 information paper on the Training and Doctrine Command's technology and capability objectives for Force 2025 and beyond notes that the future Army requires aviation assets with extended reach and increased responsiveness capable of operating in all environments and conditions. The future Army will depend on its aviation assets to deliver combat power and supplies to austere points of need.

The Defense Advanced Research Projects Agency is already developing a cargo UAS prototype that the Marine Corps will field test later this year. This technology could be used to establish an initial Army operating capability for BSB resupply to combat outposts.

This system, called the aerial reconfigurable embedded system, is capable of conducting resupply from sea basing assets located offshore. It could provide support for special operations forces and other small contingency forces and free up manned cargo aviation for more demanding missions. The system's primary mission would be routine aerial resupply to augment the overall division sustainment effort.

Autonomous systems are combat proven and here to stay for the foreseeable future. Whatever system is eventually fielded by the Army to use for aerial resupply would be best employed by the end user, the BCT.

The Manpower Argument

Some would argue that placing cargo UASs in the BCT would increase personnel requirements to maintain and operate the systems. Others may counter that aerial resupply capabilities and air maintenance assets already exist in the combat aviation brigade.

Personnel requirements may or may not increase. We are some years away from knowing for sure, but what is clear is that the number of supply convoys would decrease, which would call for fewer personnel in the BSB distribution company. This reduction could cancel out the increase in personnel required for cargo UASs.

If BSBs had the ability to use cargo UASs, they could run continuous operations, significantly reduce ground convoys, and potentially reduce the number of sustainment Soldiers required for each brigade.

Cargo UASs are coming. If we do not start the conversation now about where they belong in Army formations, then they can turn into a "nice to have" sustainment capability that sustainers will not control.

If these systems are fielded and are not placed inside the BCT, they should at least be task organized with aligned supporting units in a manner that can be incorporated easily into BCT training and deployments. Once these assets are provided to the BCT for training or mission requirements, they should be directed by the SPO, who coordinates all resupply operations.

Whichever avenue the Army decides to take, sustainers should be involved in the dialogue now and provide input for how to incorporate these assets into operational and tactical doctrine.

Maj. Nicklas J. Van Straaten is a capability developer at the Combined Arms Support Command at Fort Lee, Virginia. He holds a bachelor's degree in government and world affairs from the University of Tampa and an MBA from the College of William and Mary. He is a graduate of the Ordnance Officer Basic Course, Combined Logistics Captains Career Course, and Command and General Staff Officers' Course.

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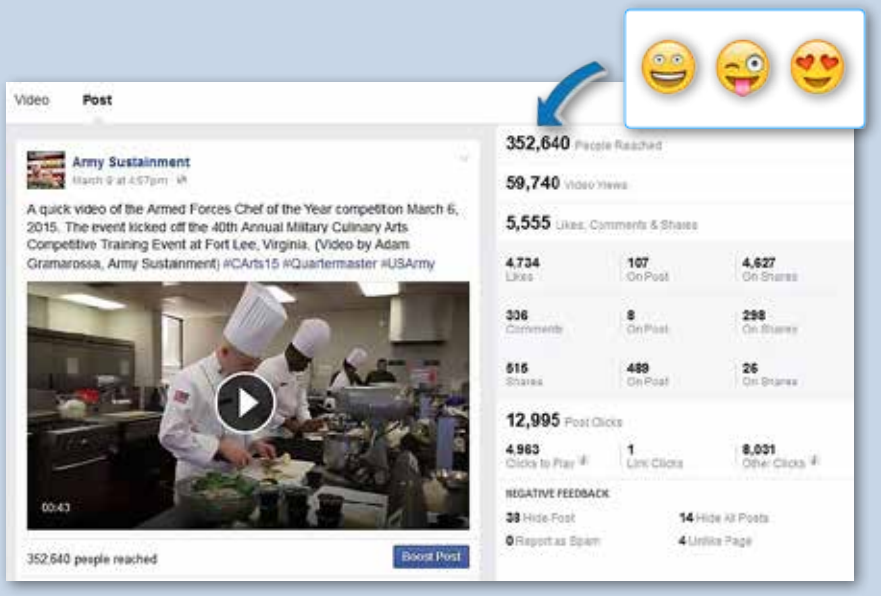

Army Sustainment's *original video on the Armed Forces Chef of the Year Competition reached over 350,000 people on Facebook.*

This photo of training in Hawaii generated a lot of discussion on Facebook among the Ordnance community.

Between March 9 and March 16, 2015, Army Sustainment *content, including this photo, was retweeted 52 times, reaching an audience of over 110,000 on Twitter.*

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A Strategic Solution to Bridging the Gap in Operational Movement Control

■ By Maj. Gen. Edward F. Dorman III, Brig. Gen. Stephen E. Farmen, and Col. Sean M. Herron

Trucks carrying 25th Infantry Division equipment enter Warrior Base, New Mexico Range, Republic of Korea, on March 6, 2015. The trucks were part of a convoy transporting equipment for joint training exercise Foal Eagle 2015. (Photo by Spc. Steven Hitchcock)

TMCE

The theater movement control element can enable more precise movement control and bridge the gap between doctrine and the ability to integrate that doctrine with other nations' systems.

An Army's ability to close with and destroy an adversary has always depended on how well it sustains troops in the field and conserves combat power to be applied on the enemy. Key to applying that power is the ability to get the right forces to the right place at the right time.

Confederate Gen. Nathan Bedford Forrest described the key to warfare as "getting there the firstest with the mostest." Achieving Forrest's method requires a movement control element with the authority to ensure that combat units and sustainment units are integrated on a finite number of routes.

Moving large armies in a theater of operations requires a complex and intricate blend of combat units and sustainment movements. This intricacy requires some form of theater-level movement control to make it all happen on time.

Movement Control

As the Army transitions from a decade of war in Iraq and Afghanistan, we must reevaluate our ability to fight against other likely adversaries and ask how these potential combat environments compare to our recent experiences. The Army operating concept, Win in a Complex World, directs leaders to do exactly that by examining how we fight and how we develop the force to provide strategic leaders with multiple options to achieve our strategic goals.

Although we must capitalize on the lessons learned from the experiences of our recent past, we must also identify capability gaps that may impede our ability to win decisively in future scenarios. Theater movement control is one of the gaps that may have a significant impact on many of these scenarios.

Current Army doctrine on movement control places the responsibility for theater movement control on the Army service component command. This command usually exercises this responsibility through the assigned theater sustainment command (TSC) or expeditionary sustainment command (ESC).

Army Techniques Publication 4–16, Movement Control, clearly spells out the movement control structure and the procedures to link movement control from the strategic to the tactical levels. It does not, however, articulate how to integrate that movement control structure with those of other services or nations in joint, combined, or coalition environments.

Integration With Host Nations

In Iraq and Afghanistan, there was little need to integrate U.S. movement control with host-nation movement control structures. In the early years, there simply was no host-nation structure. We did as we pleased and moved whenever and wherever we wanted. As time went on, we developed a fledgling host-nation system that was already integrated with our movement control structure and normally did not compete with U.S. forces' movements.

This would not be the case if we were to operate in many other parts of the world. In fact, the National Military Strategy and Defense Strategic Guidance both highlight the importance of U.S. forces operating in conjunction with other partner nations to meet our security objectives.

The implied task is that we will have to work closely within the framework of someone else's established systems to accomplish our objectives. Movement control is one of those systems, and it can halt all operations if it is not fostered carefully.

The most likely scenario would be in Korea, where U.S. movements would need to be synchronized and integrated into a very complex and constricted road network. Unlike Iraq or Afghanistan, the Republic of Korea (ROK) has very robust and modern movement control structures that have the authority to control all combined movement requests.

The ROK Transportation Command (TRANSCOM) is a general officer headquarters that integrates military and civilian movements throughout the country. In order

to move anything in that environment, the United States and other sending states will have to coordinate their movements through ROK TRANSCOM. This situation would be the same if U.S. forces were operating in most European, African, or Asian countries.

On closer examination, one can see a gap between our movement control doctrine and our ability to integrate that doctrine with a host nation or coalition of nations. The recommended solution is a low-cost concept that uses existing force structure. This solution combines the efforts of several organizations to synchronize effects and achieve results exponentially greater than the sum of the parts.

The Movement Control Gap

The mobility branch of the TSC or ESC is charged with managing the movement control functions for the theater. It can conduct movement tracking and management for U.S. forces in an operational area. It is assisted in this effort by the assigned movement control battalion (MCB) headquarters and its organic movement control teams (MCTs), which are spread throughout the battlespace, occupying critical transportation nodes.

The MCB is a very capable organization for executing the movement control plan at the tactical level, but it is not staffed to interface at the operational or theater-strategic level of the host-nation government, where movement priorities are decided and movement control plans are approved.

The term "theater-strategic" describes the Korean environment in which U.S. Forces Korea is a sub-unified command operating at the U.S. theater level while being congruent with the ROK strategic level. This term describes the mismatch between levels of war that occur in the combined arena. The MCB, commanded by a lieutenant colonel and staffed by mostly junior officers and midgrade noncommissioned officers, is out of its experience and capability depth when trying to influence decision-making at this level.

In Korea, during armistice or "normal" conditions, the organic MCB operates with ROK TRANSCOM across the spectrum, from tactical movement control to theater-strategic interface. It can do this because the volume of movement requirements is small compared to during contingency operations, when the entire ROK military mobilizes at the same time that forces are flowing into theater from the United States and more than 17 other sending states.

The MCB is well-built to execute the movement control plan at the tactical level, but it cannot span the gap from the tactical to the theater-strategic level in a contingency.

The mobility section of the TSC or ESC, operating at the operational level, also interfaces with the theater-strategic level, but it is only a staff section with fewer than a dozen people, military and civilian. The section can track movements and provide input but lacks the authority or rank structure commensurate with the host nation's strategic movement headquarters to have a serious influence on the combined movement priorities.

Put simply, during a coalition contingency in a nation with an established and functional government and military, the U.S. doctrinal movement control system is likely to be overtasked and unable to successfully integrate U.S. movement requirements with host-nation movement control structures.

Bridging the Gap

There is a definite gap in movement control capability between the operational and strategic levels. The risk associated with this gap is a lack of synchronization of movements in a complex contingency environment. If the transportation network is constricted or the total requirements exceed transportation network capacity, the commander has a significant operational risk.

To bridge this gap, a movement control element must be available to plug into the host-nation or coalition movement control structure at the decision-making level. It must have senior leaders who can provide the right level of influence to represent U.S. movement requirements as a facet of the overall theater movement program. Fortunately, this capability already exists within the Army force structure. This capability is the theater transportation opening element (TTOE).

The TTOE, assigned to the TSC or ESC and positioned with the host-nation strategic movement control nodes, can bridge the gap by translating U.S. unit and sustainment movement requirements, which are provided by the MCTs, into transportation-specific language for inclusion in the overall theater movement plan.

The TTOE ensures U.S. equities are represented in the movement decision boards and lowers the risk of unsynchronized movement plans, which likely result in clogged transportation networks and risk of mission failure caused by late unit moves or a lack of sustainment.

The TTOE was developed to close the movement control gap, which was an unintended side effect of the Army's transformation to a modular force. It was designed precisely for this mission but has not been used in the capacity for which it was designed. While deployed to Iraq and Afghanistan under sustainment brigades, the TTOEs were often broken up and their personnel used to fill other units and staff sections.

A TTOE is also a command, not a staff section of the TSC or ESC. This gives it the ability to operate alone to execute the movement control mission and report directly to the TSC or ESC commanding general. It is commanded by a lieutenant colonel and is composed of 55 movement control specialists, 21 of whom are senior noncommissioned officers or field-grade officers.

Another capability that is required for theater movement planning is the expeditionary rail team (ERT). This 34-person unit is designed to deploy

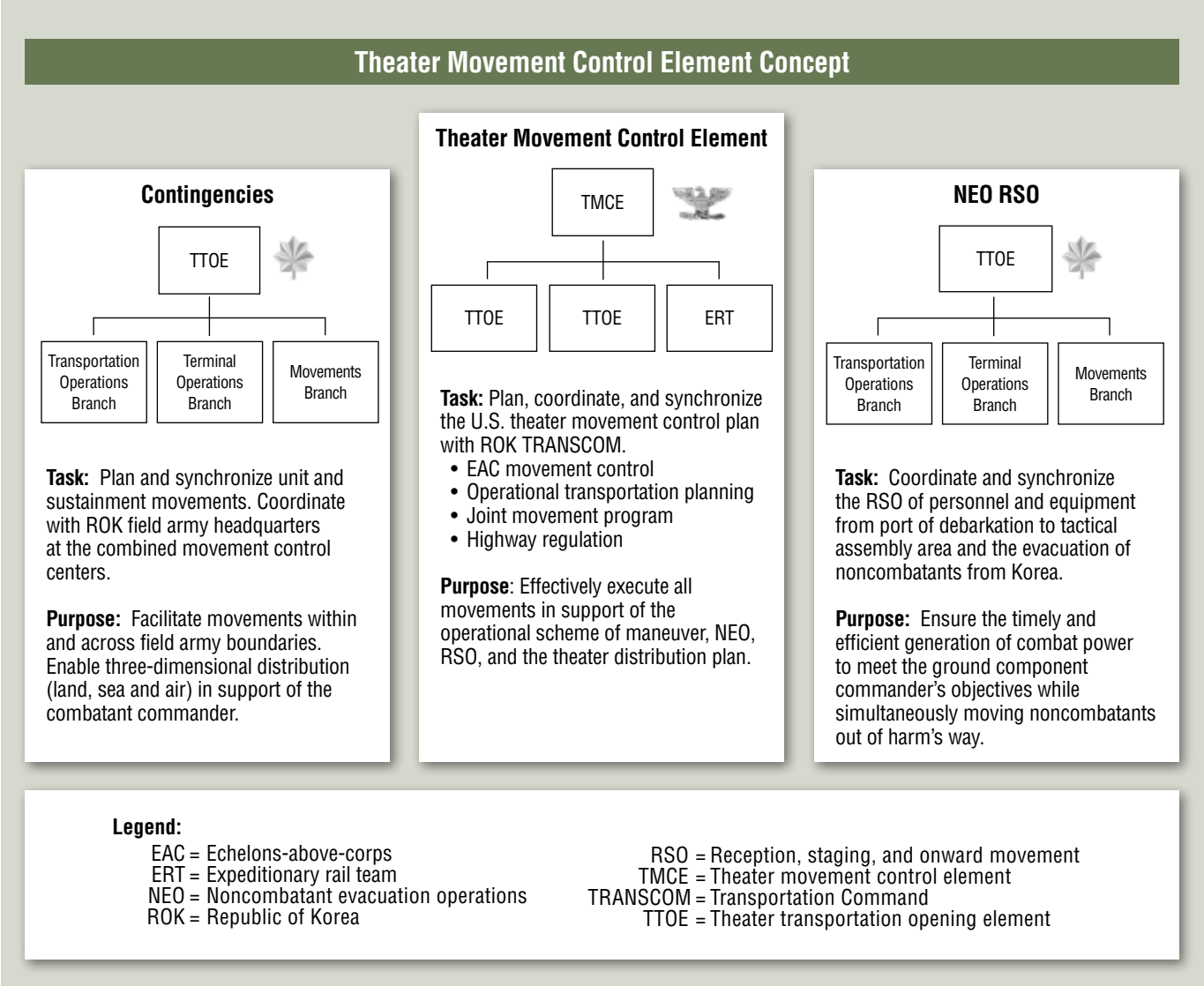

Figure 1. The TMCE plugs directly into the host-nation movement control architecture. In the case of the Korean theater, it would plug into the ROK TRANSCOM to represent U.S. interests in the development of theater movement programs.

to a theater and assess the rail network and its capabilities and advise the commander on using rail to augment the movement program.

The ERT is used for military movements or to develop commercial rail capability in the host nation. In combat zones or for humanitarian assistance and disaster relief, the ERT adds another dimension to sustaining the force. For this reason, it is an essential aspect of the theater movement control structure.

The TMCE

Together, the TTOE(s), ERT, and the MCBs form the theater movement control element (TMCE). The TMCE is led by a colonel and reports directly to the TSC or ESC commander. This colonel performs a dual role as the TMCE commander and the support operations officer. This dual role allows the TMCE to plug directly into the host-nation movement control architecture at the highest decision-making level.

In the case of the Korean theater, the TMCE would plug into the ROK TRANSCOM to represent U.S. interests during the development of theater movement priorities and programs. As part of the support operations staff, the TMCE executes U.S. movement control through the mobility section of the TSC or ESC to ensure seamless and synchronized movement control efforts.

The TMCE is a total force integration approach to bridging the movement control capability gap. The current Army force structure has six TTOEs and five ERTs, all of which are in the Army National Guard and Army Reserve. These highly capable units can rapidly deploy and make an instant impact. They specialize in engaging with the host nation in the early stages of theater opening, allowing them to establish relationships and procedures early to facili-

tate U.S. movement requirements as the theater develops.

The TTOEs and ERTs are also easy to deploy because of their small numbers and very small equipment footprint. In order to maximize the capability to rapidly deploy in the early stages of a pending conflict, each geographic combatant command (GCC) should have a TMCE with TTOE and ERT elements aligned with the Reserve component mission support command in the Army service component command.

For example, in the U.S. Pacific Command area of responsibility, the TMCE units would be aligned to U.S. Army Pacific's 9th Mission Support Command. This alignment would facilitate a habitual relationship with the ESC or TSC and allow each TMCE element to become expert in its specific combatant command area of responsibility. This total force integration approach provides a high degree of readiness at the substantially lower cost of Reserve component units.

Ulchi Freedom Guardian

The TMCE was recently exercised as a proof of concept in Korea during Ulchi Freedom Guardian 2014 (UFG14). During the exercise, two TTOEs and an ERT were deployed and positioned at critical movement control nodes, such as the ROK TRANSCOM, ports, and the multiple headquarters where movement requirements were generated.

The elements successfully established relationships with their ROK counterparts and provided expert input to the movement planning process, representing U.S. movement requirements in support of the combined forces commander's scheme of maneuver.

The presence of the TMCE in ROK TRANSCOM furthered the 19th ESC's efforts to strengthen the alliance by establishing partnerships in support of the two nations' mutual requirements. This proof of concept should become the model for other GCC's to emulate in bridging the theater movement control gap.

The Way Ahead

The TMCE's ability to reduce risk for the theater commander makes it worthy of continued development. This must occur across three lines of effort.

First, the TMCE concept must be established as doctrine through the Combined Arms Support Command's Capabilities Development and Integration Directorate. Completing a doctrine, organization, training, materiel, leadership and education, personnel and facilities analysis will allow this concept to be embedded in doctrine and will ensure it is trained and resourced to accomplish its mission when required.

Second, we must continue to refine and experiment with this new concept in exercises and simulations. The proof of concept was conducted during UFG14, but this was just the tip of the iceberg for uncovering the full capability of the TMCE. Continuing to use the TMCE in exercises and contingencies will uncover other potential applications for the TMCE to improve movement control in a theater of operations.

Finally, this concept must be written into the existing GCC operations plans. By doing this, the GCC will establish it as a valid requirement for resourcing in the time-phased force deployment data list. Validating the concept places the requirement on the Army for the continued resourcing of that capability or another capability that can accomplish the same mission.

These three lines of effort will eventually lead the Army to consider using the TMCE as a permanent rotational unit as part of the regionally aligned forces initiative. A regionally aligned forces TMCE would establish a full-time presence and relationship with host-nation movement control structures and headquarters.

The rotational forces would also participate in exercises in the assigned region, fostering a common understanding of capabilities and working practices. This would enable the TMCE to immediately begin working movement requirements during the early stages of a crisis.

Complex operations, such as noncombatant evacuation and reception, staging, and onward movement of forces flowing into the theater, are critically vulnerable to movement. An organization embedded in the movement control structure and advocating for U.S. movement priorities early in the process provides the commander increased flexibility by preventing movement bottlenecks that would delay the plan's execution.

The TMCE concept was already proven to be a value-added capability during UFG14. Feedback from U.S. and ROK leaders clearly indicated that this concept was worthy of being included in our doctrine. The concept is a low-cost opportunity, using force structure that already exists and applying it in the manner for which it was designed.

Consolidating the TTOEs and ERTs into a TMCE that deploys early provides the theater commander with a movement control solution at the operational level and bridges the gap to synchronize movement control from the tactical to the strategic levels.

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Optimizing OCIE in Europe Using Lean Six Sigma

■ By Maj. Jeremy Weestrand and Jeffrey D. Gilbert

A Soldier returns excess inventory to the central issue facility in Kaiserslautern, Germany. (Photo by Sgt. 1st Class Alex Burnett)

LSS

The 21st Theater Sustainment Command used Lean Six Sigma to improve theater-level organizational clothing and individual equipment inventory management.

The 21st Theater Sustainment Command and U.S. Army Europe (USAREUR) have successfully completed multiple Lean Six Sigma (LSS) projects as part of a focus on fiscal stewardship and continued readiness. One such project used LSS to optimize the theater-level organizational clothing and individual equipment (OCIE) inventory, resulting in cost avoidance, improved processes, and a right-sized inventory.

Equipment in USAREUR

USAREUR is a story of continual change. Its force swelled to 212,000 Soldiers in 1989 and decreased to around 30,000 Soldiers by the start of fiscal year 2015. Troop reductions and coinciding base closures eliminated four major installations over the past two years.

Prior to the most recent base closures, theater equipment stocks had grown to support modernization efforts and operational deployments. These stocks equipped Soldiers with improved clothing that had been tested over the previous decade of war and found to be more comfortable, versatile, and durable.

Theater-level sustainment operations aimed at providing effective warfighter support with greater efficiency led to multiple efforts to balance capability, capacity, and resources. These efforts led to an LSS project to examine theater-level management of OCIE.

Why LSS?

Complex problem sets often require sophisticated evaluation and management skills. Many complex problem sets arise from optimizing the complex global supply chain that links the strategic industrial base to tactical formations.

Specifically, optimizing theater-level OCIE inventory and processes requires complex analysis and detailed management at the strategic, operational, and tactical levels, so this task was a perfect candidate for using LSS tools.

LSS tools combine the power of both Lean manufacturing (reduce waste) and Six Sigma (reduce variation) in an effort to achieve process improvement.

Lean manufacturing principles date back to the Ford production line of the early 1900s and were made famous by Toyota's production system developed in Japan by Taiichi Ohno after World War II.

Six Sigma was developed by Motorola in 1986 and is central to the business strategies of many industrial sectors. Its name is derived from the probability of events across a statistical set. In a Six Sigma process, 99.99966 percent of the products manufactured are expected to be free of defects, meaning 3.4 defects per 1 million opportunities. Required process controls are so stringent that most companies strive to operate at three sigma, or 99.73-percent defect-free.

Sophisticated tools are essential in order to achieve this level of statistical fidelity and continually improve in a complex environment. The Army has used LSS tools since 2006 to effect wholesale organizational, process, policy, and procedure changes across its formations. From the most basic standpoint, the LSS method has five phases:

- ☐ Define the problem.
- ☐ Measure key aspects of the current process.
- ☐ Analyze the data to investigate and verify cause-and-effect relationships.
- ☐ Improve the current process.
- ☐ Control the new process to prevent deviations.

The 21st Theater Sustainment Command, in coordination with USAREUR, the 405th Army Field Support Brigade, and the Theater Logistics Support Center–Europe, used the power of LSS tools at the strategic, operational, and tactical levels to achieve results that addressed the challenge of theater-level OCIE inventory management.

OCIE Operations in USAREUR

USAREUR uses a hub and spoke model, centralizing management of OCIE operations in Kaiserslautern, Germany, at the OCIE Sustainment Center (OSC). The 21st Theater Sustainment Command manages the OSC as a central warehouse to hold and redistribute inventory for all central issue facilities (CIFs) in Europe.

Centralized distribution within the USAREUR footprint reduces customer wait time and demand satisfaction time. Instead of each CIF reaching back to the national industrial base for supply replenishment, the OSC maintains stocks to satisfy customer demand, potentially reducing shipping times by many months. The OSC processed 3,762 lines, more than 1.1 million pieces, and over $125 million in equipment during fiscal year 2013.

Each CIF is responsible for the direct issue of OCIE and the processing of returns. Having the CIFs dispersed across Europe where concentrations of Soldiers are located ensures that equipment will be available for Soldiers when they need it. Main CIFs have additional capabilities, such as the ability to ship directly to continental United States (CONUS) installations and to perform laundry operations.

Project Phases

To address theater-level OCIE process improvement, a team looked at the current process and potential courses of action to increase efficiency and lower costs. A cost-benefit analysis of OCIE sustainment led to the formation of an LSS team and the project launch, which resulted in $14 million in cost savings within 10 months. The project was divided into the five LSS phases.

Define. The first step in LSS is to define the problem. To do this, the project team completed an inventory analysis of the OSC to determine the average days of supply (DOS) on hand.

The Army manages OCIE through a database residing in the Installation Support Modules (ISM) system. ISM supports logistics business functions associated with the management and accountability of OCIE. Using the exportable feature of ISM, an Oracle database called Discoverer, the LSS team analyzed the lateral transfer register files to generate the demand data for each piece of OCIE.

Then, using a series of Microsoft Excel-based lookup tables, the team determined the DOS by taking the inventory currently available for issue and dividing it by the average daily usage. The project scope was narrowed by considering only items on the OCIE standard issue list, meaning that they are issued to every Soldier. As a result, the team determined that the DOS average was an astonishing 2,203 days, or about 6 years.

Measure. During the measure phase, the team determined the average DOS and compared that to historical data going back 15 months. The result was a capability analysis that compared the DOS average over time with the Department of the Army standard of 180 days.

To account for this shift, an index for process capability (Cpk) was used to account for the dynamic mean shift in the process, or the amount that the process is off target. Typical goals for Cpk are greater than 1.33 or 1.67 for safety-related items. The LSS team determined the resulting Cpk was –35.7, meaning the process was nowhere near capable.

For example, think of parking in a garage. A Cpk of 1.67 means that you have parked your compact car directly in the center of the one-car garage,

A Soldier is issued the Operation Enduring Freedom camouflage pattern at the Stuttgart, Germany, central issue facility. (Photo by William Hammond)

where a Cpk of –35.7 means that you have parked your car in the neighboring town.

Analyze. The third project phase was to analyze the data and determine the root causes that were affecting the DOS. The LSS team used a series of tools to do this, including developing a cause and effect diagram (or "fish bone chart") and conducting Pareto analysis, failure modes and effects analysis, and analysis of variance.

Results of the Pareto analysis and analysis of variance determined that cold weather and protective equipment accounted for 76.5 percent of the total days of supply across the data sample. The highest DOS belonged to the sleeping equipment category, which had an astounding average of 8,837 days.

The team then used a multi-voting technique to determine the critical root causes influencing the data and put them in order based on risk priority number, which was based on the severity, occurrence, and detection. The complex process to dispose of excess inventory and a lack of standard operating procedures were the top root causes, which the team looked to correct during the improve phase.

Improve. In the fourth project phase, improve, the LSS team determined the improvements for the process and piloted an excess inventory reduction plan. An initial list of 71 potential solutions was narrowed down to 10 based on benefit and effort analyses.

These solutions included strategic-, operational-, and tactical-level OCIE working groups, updated operating procedures, improved training, performance metric development and management, organizational inspection programs, updated contingency levels, and pre-positioning of CONUS shipments.

Team members voted on benefit and effort required for each solution and also selected their own personal choices. The team focused on solutions with high value that were easier to implement.

The LSS team implemented these solutions across three levels: strategic (led by USAREUR), operational (21st Theater Sustainment Command), and tactical (405th Army Field Support Brigade). The pilot inventory reduction effort resulted in over $5 million worth of OCIE removed from stock and then redistributed to six CIFs in the United States with valid requirements.

An employee stores retrograded organizational clothing and individual equipment in Germany. (Photo by Sgt. 1st Class Alex Burnett)

Control. The final phase was to control the new process to prevent deviations. During this phase, the LSS team redistributed an additional $9 million in OCIE by using the new process map developed during the improve phase. The control phase also included a long-term implementation plan, outlining the frequency of each process control measure and responsible organization.

Quick Wins

A key tenet of LSS is to identify and implement improvements that can be made quickly and inexpensively. These are known as "quick wins." The OCIE project team identified several during the course of the project.

Automated inventory management. ISM allows automated inventory management functionality by tracking demand data and setting reorder points for items. However, for ISM to generate that data, it requires a completed issue transaction.

Since the process for inventory transactions between the OSC and CIFs within USAREUR was through lateral transfers, and not issue transactions, none of this data was captured in ISM. The LSS project team recognized fixing this as a potential quick win and engaged programmers from the Program Executive Office Enterprise Information Systems. The programmers completed a software modification that took effect two months after the start of the LSS project.

Total stockage allowance. The LSS team reviewed the automation results line by line and updated each item's contingency level, which is the amount specified to cover non-demand-supported requirements. Contingency levels, along with the demand-based retention levels and requisition objective levels, determine the total stockage allowance.

The purpose of this allowance is to help identify materiel available for lateral transfer between CIFs. The project team used the updated total stockage allowance data to generate a follow-on excess reduction list worth $27 million for the next fiscal year.

Streamlined shipping operations. The OCIE project team enabled a trans-ship process to reduce the number of steps required to ship items from CIFs in Europe to CONUS.

In the new process, excess inventory is sent to the OSC's shipment staging area, where the Theater Logistics Support Center–Europe completes the required steps of pallet construction, configuration, cleaning, and inspection. These steps are built into the process lead time, and there is only one lateral transfer transaction from the shipping CIF to the receiving CIF in the United States. The trans-ship process eliminates the need to return items to stock and pull them out on a separate transaction.

In just eight months, the project team completed each of the five LSS phases and achieved results that vastly exceeded expectations. The 21st Theater Sustainment Command, in coordination with project team members, facilitated the movement of $14 million in excess OCIE inventory shipments to six different installations in the United States. The redistribution of OCIE offset future requirements at these installations, saving the Army money.

The project achieved operational benefits by improving the existing process. The team's actions reduced inventory, transactions, and storage space required for OCIE sustainment operations across Europe.

Additionally, the quick wins that the project team implemented enabled automated inventory management and streamlined the theater distribution process. Through the effective use of LSS tools, the team saved millions of dollars and improved OCIE operations across the continent.

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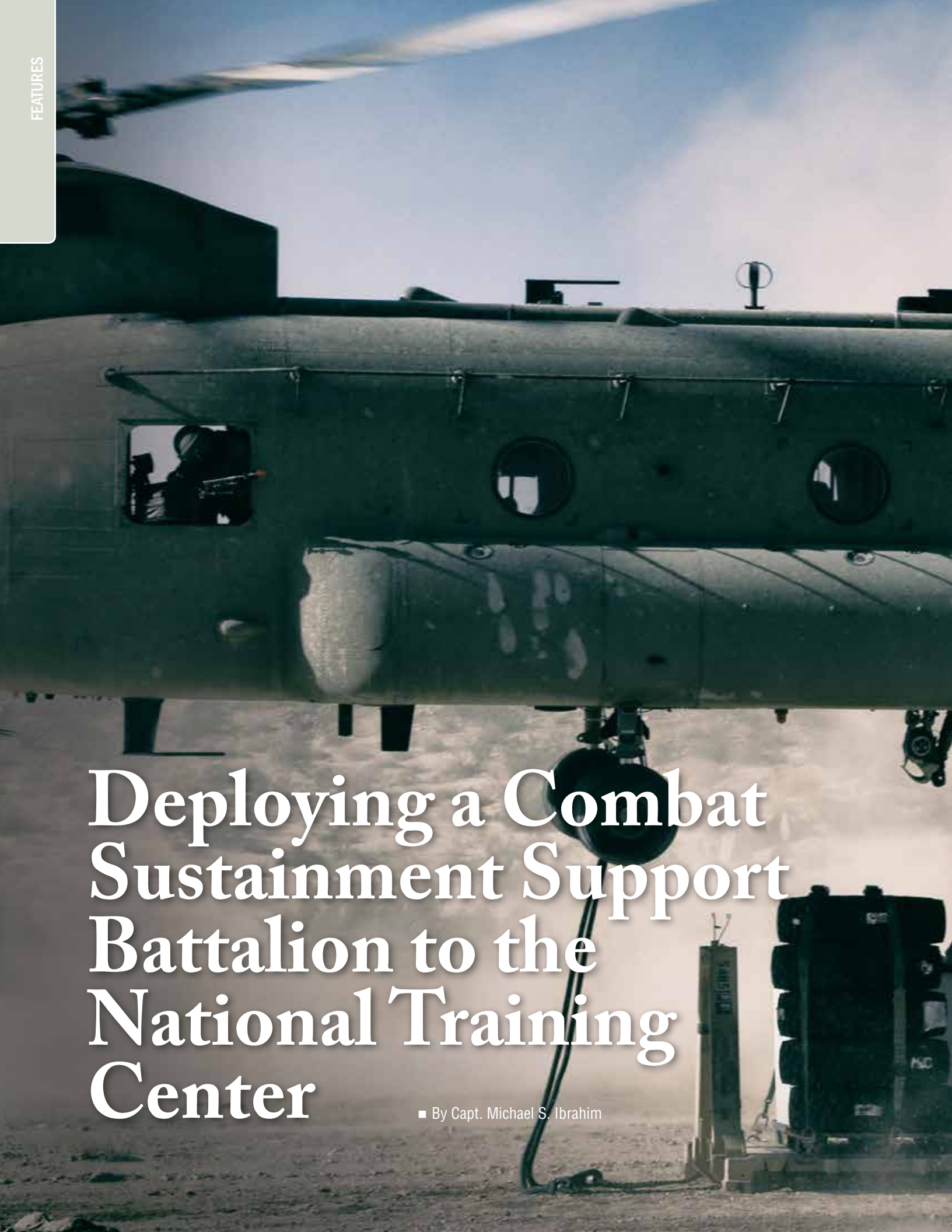

Deploying a Combat Sustainment Support Battalion to the National Training Center

■ By Capt. Michael S. Ibrahim

Soldiers from the 35th Combat Sustainment Support Battalion hook up supplies to a CH-47 Chinook helicopter during sling load training at the National Training Center at Fort Irwin, California, May 19, 2014. (Photo by Sgt. Paul Sale)

CSSB

The 35th CSSB provided sustainment support, conducted a tactical convoy, and faced an enemy guerrilla force during a rotation at the National Training Center.

During a training exercise in May 2014, the 35th Combat Sustainment Support Battalion (CSSB) deployed into a notional foreign country to support the 2nd Stryker Brigade Combat Team, 25th Infantry Division (2–25 SBCT), which was already on the ground. The brigade's mission was to defend a small host country against its aggressive neighbor to the north.

While the 2–25 SBCT focused on fighting a conventional army on the northern border, the 35th CSSB faced an enemy guerrilla force. This guerrilla force was adaptive, intelligent, well-trained, and well-armed. The 35th CSSB conducted its assigned mission, protected its assets, and learned many wartime lessons.

The unit suffered more than 60 casualties while transporting supplies to the northern front. Thankfully, all of the casualties were notional. The deployment and combat operations had all taken place within the confines of the National Training Center (NTC) at Fort Irwin, California. The enemy guerrillas were 11th Armored Cavalry Regiment Soldiers who were trained in current enemy tactics and equipment.

Planning Sustainment

The 35th CSSB "Samurais" received notification that they would be deploying to the NTC exactly 94 days prior to their first contact with the "enemy" guerrillas. It was during those three months prior to the deployment that the unit needed to prepare itself for the test to come.

At the NTC, visiting units train in austere conditions that force them to survive on their own. This training is part of the center's evaluation model that tests the unit's mission command in a staged, realistic deployment without infrastructure.

Before deploying, all leaders of the 35th CSSB and the 2–25 SBCT attended a leaders' training program conference. During the conference, the CSSB created its logistics plan and met subordinate and supporting units. These units would attach to the 35th CSSB for support during the upcoming deployment to the NTC.

Upon arrival, the 35th CSSB commander led a small contingent of his staff in the initial planning analysis. The CSSB staff was responsible for creating the logistics plan and executing mission command over subordinate units. The commander focused his staff on creating a supply plan for bulk water, bulk fuel, and ammunition. The staff estimated supply requirements for each Soldier and vehicle in the units that they would have to support.

Request for Forces

The 35th CSSB, unlike other CSSBs, has no organic transportation or supply companies and is primarily a forward supply headquarters. It can conduct mission command over sustainment operations at its home station in Japan and throughout deployed areas of operation.

In a standard combat theater deployment, the 35th CSSB would take operational control of two medium truck companies, a quartermaster company, a maintenance platoon, a signal platoon, and a medical section to conduct its mission.

In late February 2014, the unit sent up requests for forces and resources to fill the CSSB's requirements through the Forces Command (FORSCOM). As the leader's conference commenced, the CSSB had no clear confirmation of who would augment or support its operations. FORSCOM had tasked U.S. Army Pacific (USARPAC) to fill the requirement. However, USARPAC did not have the requested forces mobilized because it struggled to create a nonstandard and nondoctrinal mix of forces to fill requirements.

USARPAC eventually resourced the 35th CSSB with a distribution company (A Company, 325th Brigade Support Battalion [BSB]) and the 21st Inland Cargo Transfer Company (ICTC).

The 35th CSSB and its newly identified subordinate companies left the

conference with a plan on how they would conduct their upcoming deployment. The transportation and supply tasks were divided between the A Company and the 21st ICTC. These two companies were responsible for convoy security and hauling water, fuel, and trash. The primary mover for hauling water, fuel, and trash would be the M1088 tractor-trailer, so A Company trained 25 crews on the equipment.

The 21st ICTC focused on hauling ammunition and all other palletized loads. These palletized loads consisted of repair parts and meals ready-to-eat. The company noted that it needed to train 12 palletized load system crews and seven load handling system crews.

The CSSB later received more than 40 personnel from the Army National Guard. These personnel came to support the CSSB's maintenance operations. Because of rapid mobilization, the Guardsmen's orders came within weeks of their departure date. This time constraint severely affected their ability to prepare and plan for the deployment.

Training and Equipping

When the A Company and 21st ICTC commanders returned to their home stations, they each had six weeks to prepare their companies for the upcoming deployment. Neither of the companies had ever worked with a CSSB before this deployment. The companies conducted crew training for their specific vehicles and conducted training on individual Soldier tasks, such as weapons qualification and first aid.

The company's senior trainer, the truck master, led the crew training. This training began once the company's truck master acquired the equipment that the Soldiers needed to be licensed on, be it an M1088 tractor truck with trailer or palletized load system and load handling system.

Once the equipment was on hand, the truck master conducted in-depth classes with all potential crews. These crews showed proficiency in all tasks required in the truck master's curriculum, which included driving with night-vision goggles, loading and unloading cargo, and handling and maintaining equipment.

The A Company had the added requirement of training three gun truck platoons for the deployment. These gun trucks provided the only security for the supply convoys traveling through enemy territory.

The A Company trained the gun truck platoons to be competent in their weapon, maneuver, and cross communication skills. The Soldiers qualified on their individual and crew-served weapons. Afterward, the crews had virtual convoy training and conducted convoy live-fire exercises.

During the convoy live-fire exercises, the gun truck platoons practiced engaging targets while stationary. They also practiced and perfected engaging targets while on the move. Overall, the crews practiced extensively as a team in maneuvering and maintaining convoy security.

Equipment Problems

The CSSB's first missions were to establish ammunition caches for the brigade in forward logistics elements. During armed conflicts, communication can be difficult on the battlefield. At the NTC, the terrain is vast and hilly. The topography limits land-based communications systems and their operational usage. Satellite-based communications systems would have been ideal.

Unfortunately, advanced communications assets were not available for the 35th CSSB, so the convoys had to communicate using FM radios. Because of the terrain, the convoys would lose FM communications with their elements within the first few kilometers of departing the logistics support area (LSA).

During the initial mission planning conducted at its home station in Japan, the 35th CSSB identified the lack of advanced communications equipment as an issue and prepared a backup communication plan. The backup plan called for the use of the Movement Tracking System (MTS) in CSSB convoys.

> If the CSSB could not properly forecast the supplies needed, either it would send too many supplies and overtask its limited transportation assets or, even worse, it would not send enough of the right supplies and limit the brigade's ability to fight.

However, the NTC had a very limited number of vehicles equipped with MTS. In fact, many NTC vehicles did not even have FM radio mounts. This placed a serious constraint on each convoy's ability to communicate within the convoy and with the higher headquarters.

Setting Up

After establishing the forward logistics elements and ensuring the brigade's immediate supply requirements could be met, the CSSB deployed into the training area. The transition took two days and required a quartering party to declare the new LSA site safe before personnel and equipment could occupy it.

The battalion's headquarters and headquarters company (HHC) led the quartering party and was responsible for checking the new LSA site for chemical, biological, radiological, and nuclear contamination and enemy booby traps. Once the site was cleared and deemed safe, the 35th CSSB moved to it and established LSA Santa Fe as the battalion headquarters.

The battalion tactical operations center (TOC) was established in

a large deployable rapid assembly shelter and acted as the command and control node for all battalion operations during the deployment.

The companies established their TOCs in smaller general purpose medium tents next to the battalion TOC. This arrangement was done out of necessity, despite the tactical risk, because of the lack of communications systems.

The TOCs needed to maintain close proximity to the communications centers. The battalion TOC organized itself into two different sections: operations and administration. This arrangement made cross communication immediate, improved situational awareness between sections, and reduced planning time for missions.

Defensive Operations

After the battalion and company TOCs were established, the focus switched to establishing the LSA's defenses. At this point, convoy operations were ongoing, but it was essential to respond immediately to enemy forces advancing on the perimeter. This essential defensive countermeasure became the responsibility of the CSSB HHC.

Enemy operations began within the first 24 hours of occupying the LSA. The enemy divided its attacks between the LSA and convoys. When attacking the LSA, the enemy took a traditional approach of conducting a series of surveillance and harassment operations before launching a large-scale assault.

The assault included 33 enemy personnel, rocket-propelled grenades, light machine guns, and several vehicle-borne improvised explosive devices (IEDs). The LSA's defense was an entry control point guarded by gun trucks and Soldiers.

A quick reaction force (QRF) of Soldiers also responded to threats. As the attacks on the LSA intensified, the HHC found that the defenses at the entry control point and the QRF were not enough to defend the LSA.

The HHC understood that it was dealing with an experienced enemy and had to improve the defense of the LSA. It came up with a defense plan that called for dividing the LSA into sectors and assigning companies to secure them. If an attack occurred, a company moved to guard its assigned sector, clear it of enemy personnel, and transport any friendly casualties to the aid station.

Convoy Operations

With base defenses emplaced, the 35th CSSB focused on the primary mission of supplying the deployed SBCT. The requirements for the SBCT were enormous; fuel consumption alone outpaced the transportation capability for each day.

If the CSSB could not properly forecast the supplies needed, either it would send too many supplies and overtask its limited transportation assets or, even worse, it would not send enough of the right supplies and limit the brigade's ability to fight.

In order to forecast supply requirements, the 35th CSSB's support operations officer (SPO) worked with the BSB SPO. The brigade's SPO had trouble providing a realistic forecast of the supply requirements because of a lack of communication with the supply officers. Because of this, the CSSB had to react to the brigade's needs at a moment's notice.

A CSSB convoy works from a supply request derived from the BCT's operating tempo. This request, or transportation movement release (TMR), is the guiding requirement logisticians use to build logistics convoy packages. The TMR lists the requirements for fuel and water or for any of the classes of supply.

TMRs from the brigade were to be submitted 48 hours prior to the convoy's initial movement. However, because of the lack of forecasting from the brigade, the CSSB organized the convoys 12 hours before movement on average. This hindered the CSSB's ability to plan or consolidate convoys for movement and also degraded the companies' ability to plan work and rest cycles.

To complicate matters further, because of the nature of the fast-paced battle rhythm, the brigade often changed its TMR within hours of a convoy's departure. This made creating the correct convoy package chaotic and problematic in dangerous environments.

To limit the chaos, the CSSB instituted several standard operating procedures that helped bring structure to the convoys in the rush of assembling. These procedures also helped the convoy commander maintain accountability and safety. The battalion referred to these standard procedures as a convoy packet.

Each packet included a risk management assessment, which was a manifest of sensitive items and personnel. The packet also included the latest intelligence about the route the convoy would take and the signal operating instructions.

As soon as the packet reached the convoy commander for approval, a mission rehearsal was conducted. Members of the SPO and S–2 would provide updates from their sections to all the crewmembers going out on the mission.

After the briefing concluded, the convoy commander and the assistant convoy commander performed precombat checks and inspections to verify the information with convoy members. With all checks completed, the convoy requested permission from the battalion TOC to depart, and the mission would begin.

The Convoy Through Nabran

A convoy operation is generally a laborious undertaking. Convoys move at slow speeds, and the NTC has the added threat of extreme heat and dust, which can reduce visibility to within 10 meters. It was under these conditions that the 35th CSSB conducted its missions and fought for survival against enemy forces.

On May 29, 2014, when the sun was just beginning to rise, CSSB

Soldiers prepared their vehicles for their upcoming mission. The convoy commander received the mission order the night before from his company commander. The convoy commander conducted his rehearsal and precombat checks and briefed the mission, which was to bring food and water to the brigade support area (BSA). The Soldiers were ready.

On the other side of the battlefield, the enemy was having a similar briefing. An enemy guerrilla leader, code named "Road Runner," was standing outside of the small town of Nabran. Nabran was tactically important because it sat directly on the main road running through the area.

Road Runner briefed his men on how to ambush a U.S. supply convoy. His experience made him a meticulous planner. He knew everything from IED placement to support by fire positions.

As midday approached, a last-minute request for fuel came from the brigade. It took an extra two hours to assemble and check the added crews and vehicles, but by 1300 hours, the convoy and security vehicles were assembled and ready to receive the convoy briefing.

The convoy leaders were eager to receive the latest intelligence on enemy operations along their route. They also requested reconnaissance assets to support their movement eastward. Intelligence reported that the only suitable route would be through the town of Nabran, but enemy contact was expected in the areas surrounding the town. Approximately 20 enemy fighters reinforced Nabran, and the town acted as an enemy base of operations.

An alternate route to the north, avoiding Nabran, had been closed because of enemy artillery observers; this forced the convoy to drive past the town. Brigade reconnaissance assets were all dedicated to the ongoing battle in the north and could not support the 35th CSSB that day.

When the intelligence briefing concluded, the convoy commander conducted his safety brief and requested permission from the battalion to depart. At 1400 hours, the convoy departed on its mission, which would require driving more than 100 kilometers through the heart of enemy guerrilla operations.

The Battle

In the late afternoon, the convoy entered Road Runner's ambush. Road Runner had placed an observer on a nearby hill, which gave him and his guerrillas advanced warning of the convoy's presence. Road Runner had worked very hard to conceal his ambush, which included a set of daisy-chained IEDs.

At 1610 hours, three IEDs exploded in quick succession, destroying the first two vehicles in the convoy, including one gun truck. The instant the smoke cleared, Road Runner and his guerrillas went into action, assaulting the convoy from both sides.

Rocket-propelled grenades, and light machine-gun fire provided cover fire as the guerrillas assaulted. Their goal was to destroy the three remaining gun trucks and then finish off the rest of the convoy, one vehicle at a time.

Once the IEDs detonated, the convoy commander used his FM radio to direct the assistant convoy commander to send a situation report to the battalion TOC and began directing a counterattack with his three remaining gun trucks.

The ambush location was exceptionally well-placed. It was less than 500 meters from the town of Nabran and in a natural defile. The maneuver room was limited, and the remaining gun trucks had difficulty maneuvering but managed to squeeze between the vehicles and the attacking guerrillas. In the ensuing gunfight, Road Runner was forced to retreat after losing 10 guerrilla fighters.

Both sides had taken heavy casualties. After the retreat, the convoy commander requested medical evacuation support for 17 casualties and directed recovery operations for six disabled vehicles. With medical evacuation and recovery efforts complete, the convoy moved on to the BSA. The convoy made it to the BSA by nightfall and returned to the LSA the next day.

Lessons Learned

The convoy operation was an example of all the challenges the 35th CSSB faced during the deployment to the NTC. It was an exceptionally tough training event, but the lessons learned by the 35th CSSB were invaluable. The 35th CSSB will take these lessons learned with them wherever they go in the future:

- ☐ Rehearse tasks with your subordinate units before you deploy because creating a team once deployed is like building an airplane while in flight.
- ☐ Plan and rehearse communication, especially your satellite-based communications architecture. Communicating is the hardest thing to do on the battlefield.
- ☐ Plan intricately. Leaders are required to fill gaps and focus the officers and Soldiers on what is most important.
- ☐ Use liaison officers to help fill communications gaps and coordinate logistics operations when in the BSA.

The experiences taken from this training event are valuable for veteran and junior Soldiers alike. The CSSB increased its combat effectiveness, and it stands ready to deploy when called upon.

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Students practice using fuel equipment and hand and arm signals during an initial exercise. (Photo by 1st Lt. Jon Sullivan)

Afghan Air Force Refuel Training

While providing logistics support for an aviation task force in Afghanistan, a forward support company trained Afghan airmen on forward arming and refueling point operations.

■ By Capt. Lanea J. Sudweeks, Capt. David G. Jenkins, and 1st Lt. Jon P. Sullivan

In December 2013, the forward support company (FSC) with Task Force Attack, 3rd Battalion, 101st Aviation Regiment, 159th Combat Aviation Brigade, deployed to Afghanistan's Regional Command (RC) East to provide logistics support to the aviation task force and the surrounding region. The company's deployment mission was to provide primarily classes III (petroleum, oils, and lubricants) and V (ammunition) support for brigade, coalition, and Afghan aircraft and ground maintenance support for the task force.

Midway through the deployment, the FSC had a unique and somewhat unprecedented opportunity to provide forward arming and refueling point (FARP) training for select airmen of the Afghan Air Force (AAF) as they prepared to assume this mission in the near future. This article describes the processes and methods the FSC used to successfully train the AAF counterparts to assume the critically important FARP mission.

Shortfall Identified

In early 2014, as coalition forces continued to retrograde equipment and personnel from outlying regions, small bases and outposts were rapidly being turned over to Afghan forces. It became apparent that in order to maintain the operational reach provided by coalition forces and meet its refueling needs, the AAF would need to assume responsibility for the FARPs.

According to Army Techniques Publication (ATP) 3–04.94, Army Techniques Publication for Forward Arming and Refueling Points, "The FARP's ability to provide fuel and

ammunition where and when needed on the battlefield is vital to the success of Army aviation combat missions." Although this description applies to U.S. Army-run FARPs, the same principles also apply to the AAF's refueling mission.

Because of the Task Force's relationship and proactive involvement with the AAF element at Forward Operating Base Fenty, discussions on building a refueling capability organic to the AAF started immediately. Both units recognized that maintaining a refueling capability in Kunar province was mission essential. However, the possibility of losing a coalition FARP in the relatively near future accelerated discussions and planning for building a refueling capability for the AAF.

Mutual interest in ensuring mission success and avoiding the "not our problem" mentality led to a unique training opportunity that strengthened the task force's partnership with the AAF. Since Task Force Attack was co-located with the Afghan aviation contingent, the mission was formally given to the task force to ensure the AAF element at the forward operating base had the capability to assume complete responsibility for FARP operations independent of U.S. or coalition forces.

Developing a Plan

The memorandum of instruction for training focused on the AAF's refueling requirements. The question became, "How do U.S. Army FARP operations and practices need to be modified in order to provide the training required for the AAF?"

The FSC decided to focus on universal practices that would ensure accountability of both the fuel and the FARP equipment, equipment maintenance, and fuel quality. For planning purposes, the FSC assumed that most of the FARP equipment would be equipment previously transferred to the Afghan military or equipment that would transfer to the AAF once coalition forces retrograded.

The training plan development was collaborative and included input from technical experts within the FSC fuel section and the distribution platoon leader. The plan assumed that none of the airmen had refueling experience and would begin with the basics. The instruction would then shift to familiarizing the airmen with the orientation and layout of a FARP and its associated equipment.

Safety procedures, hand and arm signals, and grounding and bonding procedures were to be taught first. Next, airmen would receive an in-depth understanding of FARP equipment operation, fuel site recirculation, fuel transfer, receipt of bulk fuel, fuel quality testing, and fuel accountability procedures.

Armed with a training outline, the FSC's distribution platoon leader and the Task Force Attack primary liaison officer with the AAF presented their recommended training plan to the AAF detachment commander. With a number of meetings, they determined the length and location of training and the number of students to be trained.

The task force liaison then arranged for the temporary reassignment of the brigade's cultural adviser to the task force to help facilitate the training. The daily lesson plans were created and the cultural adviser translated them by hand into Pashto for the students. Translating was a lengthy process that required the platoon leader to explain each slide's meaning to the adviser.

Training Begins

The first class began with an air of trepidation as the students, instructors, and interpreter worked through the initial awkward moments of broken communications. Although the first day was intended as a FARP overview, the students quickly expressed their interest in each piece of equipment, asking insightful, quality questions about the mechanics of the equipment, its sustainability, and long-term capabilities. The students maintained this eagerness to learn throughout the course.

On the second day, it became obvious that hands-on learning was universally preferred, especially since the Pashto language could not support the technical jargon associated with the training.

Shortly after concluding a practical exercise where students validated what they learned in class, two MI–17 Afghan Air Force cargo helicopters landed, allowing an impromptu opportunity to refuel Afghan aircraft.

The students instantly recognized the opportunity and requested personal protective equipment to refuel the aircraft. The students successfully refueled the helicopters, operating all equipment and conducting the proper hand and arm signals. This event set a positive tone for the course.

Course Challenges

Several areas of the course were destined to be difficult. The instructors anticipated that the fuel quality tests (testing for the presence of water and for filter effectiveness) and fuel accountability would be the most challenging to teach. The students proved them wrong about the fuel quality tests. They quickly caught on to the mechanics of the testing equipment and could accurately talk each other through conducting the test.

One student challenged the validity of the test and the testing equip-

ment and wanted to ensure it gave an accurate reading. He added water to the fuel sample and was satisfied when the equipment went off the scale in water readings.

Fuel accountability proved to be the most difficult subject to instruct. The process for taking accurate and consistent measurements while gauging a collapsible fabric fuel tank is a challenge for even trained Army petroleum supply specialists.

After measurements are taken, a hydrometer is used to measure the American Petroleum Institute gravity and temperature of the fuel. These measurements are cross-referenced on strapping charts and conversion tables to convert the fuel temperature to 60 degrees Fahrenheit, the standard temperature for fuel accountability.

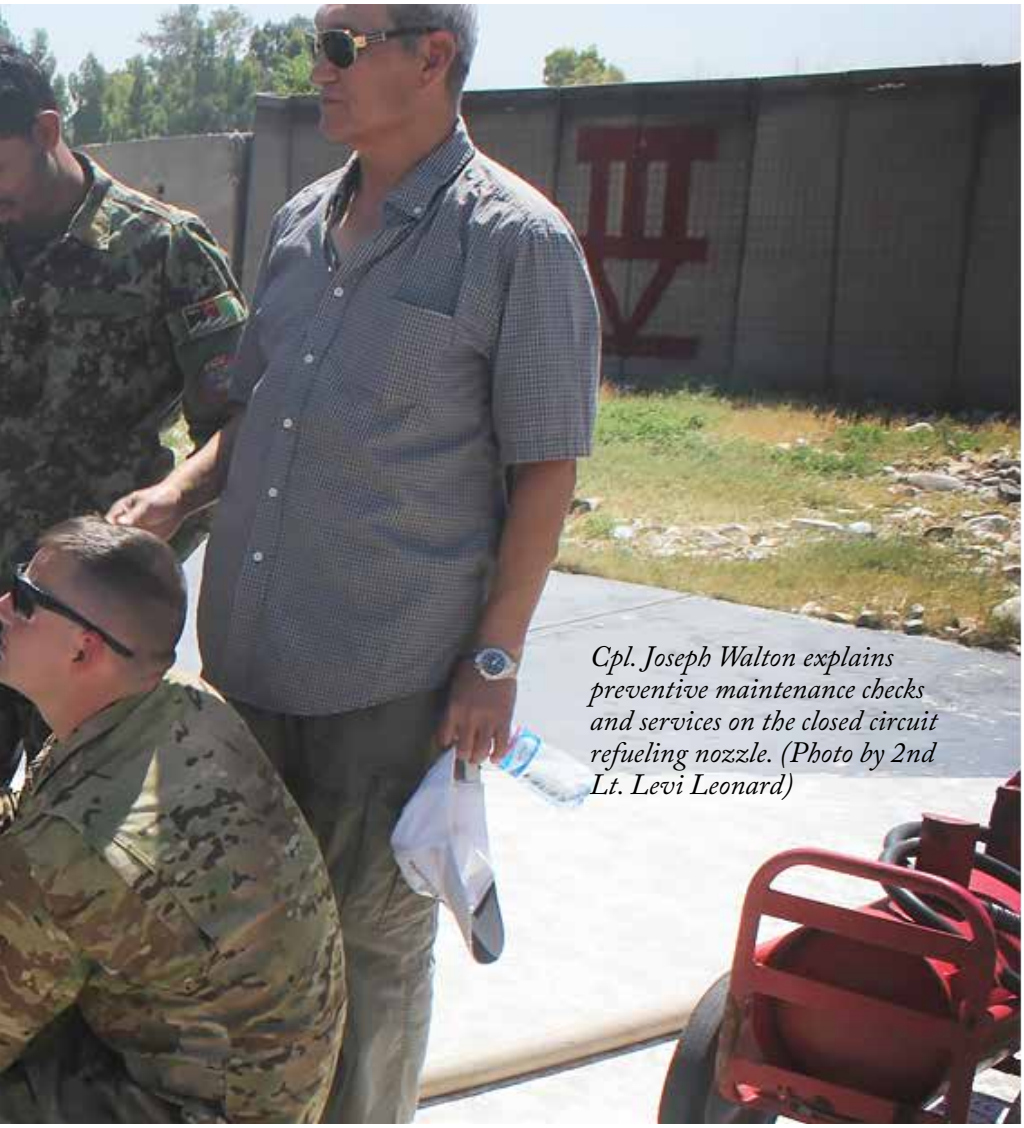
From this point, the final amount of fuel on hand can be determined. The entire process used the American standard measurement system in addition to the American Petroleum Institute gravity measurement from the hydrometers in the testing kit. It was the most frustrating day because of the challenging measurement processes and language barriers.

At the end of the course, a final practical exercise was organized and completed using the equipment at the FARP. Students recirculated the fuel through the system, completed all required testing procedures, operated the necessary FARP equipment, and completed the exercise successfully.

Success and Graduation

A trip was planned to a FARP in RC East that the AAF may take over in the future. The possibility of turning over a coalition FARP was an important step to ensuring the Afghan leaders had buy-in before the training began. The students and the platoon leader met at the FARP, and the FARP noncommissioned officer-in-charge (NCOIC) proceeded to walk the group through the new footprint, highlighting the key differences between the two locations.

One of the AAF officers talked the other students through each piece of equipment that the NCOIC showed them, describing function and purpose and surprising the NCOIC



Cpl. Joseph Walton explains preventive maintenance checks and services on the closed circuit refueling nozzle. (Photo by 2nd Lt. Levi Leonard)

with the knowledge the students had regarding the equipment and FARP operations. Two MI–17s arrived to retrieve the students, and before leaving, the students refueled the aircraft from the new site with no assistance.

A graduation event at the AAF compound was coordinated to recognize the students at the end of the course.

Cultural Growth Opportunities

Coming into this deployment, the FSC was not prepared to advise or assist the Afghan military. Changes in the operational environment led to a requirement that opened opportunities for leaders at the company and battalion task force levels to interact with the Afghan military.

The training provided a unique experience because Army aviation units have not typically partnered with Afghan forces in the past, as other maneuver elements routinely do. It pushed the instructors and liaisons outside their comfort zones, giving them the opportunity to use an interpreter and interact with the Afghan people. All who were involved with the course had to rethink the way they speak and communicate ideas.

The brigade cultural adviser provided additional insights, describing the rich history and ethnic diversity found in Afghanistan. Over the course of the training, members of Task Force Attack shared multiple meals, both Afghan and American, with the Afghan students, increasing the cultural understanding between the two groups and providing more occasions to discuss their respective cultures.

Breaking away from tradition and exploring new opportunities enabled the task force not only to help shape the future of Afghan support for Afghan military operations but also to build and strengthen relationships among the AAF, the task force, and ultimately coalition forces.

Capt. Lanea J. Sudweeks is the company commander of Headquarters and Headquarters Company, 159th Combat Aviation Brigade. She was the company commander for the forward support company of Task Force Attack, 3rd Battalion, 101st Aviation Regiment, 159th Combat Aviation Brigade, at Fort Campbell, Kentucky. She holds a bachelor's degree in animal science from Iowa State University and is a graduate of the Combined Logistics Captains Career Course, the Air Assault Course, and the Pathfinder Course.

Capt. David G. Jenkins, a CH–47F Chinook helicopter pilot, has retired from the Army. He was an assistant operations officer for Task Force Attack, 3rd Battalion, 101st Aviation Regiment, 159th Combat Aviation Brigade. In this capacity, he served as the liaison officer to the Afghan Air Force detachment co-located at Forward Operating Base Fenty with Task Force Attack. He is a graduate of Embry-Riddle Aeronautical University and the Maneuver Captain's Career Course.

1st Lt. Jon P. Sullivan is the executive officer for the forward support company for the 3rd Battalion, 101st Aviation Regiment, 159th Combat Aviation Brigade. He was previously the company's distribution platoon leader. He holds a bachelor's degree in criminal justice from the University of Mississippi. He is a graduate of the Quartermaster Basic Officer Leaders Course and the Air Assault Course.

Chief Warrant Officer 4 Mark Davis, an allied trades warrant officer, provides instructor training to Staff Sgt. Gregory Vaughn, an allied trades specialist, on the Haas Automation TM–1 CNC milling machine in the Metalworking Services Division of the Army Ordnance School at Fort Lee, Virginia.(Photo by James Siemen)

Transitioning From Manual to Automated Machining

■ By James H. Siemen

I entered the Army in 1988 as a military occupational specialty (MOS) 44E (machinist) under the Army Civilian Acquired Skills Program. Since I had received industry standard manual machinist training, equivalent to the Army's machinist training, the program exempted me from advanced individual training.

In 2015, 27 years later, the Army Ordnance School at Fort Lee, Virginia, continues to train Soldiers using the same machining technology and equipment for the MOS 91E (allied trades specialist) courses; however, industry standards have expanded.

Background

Allied trades specialists train as entry-level metalworkers, focused on fabricating, welding, repairing, and modifying both metal and nonmetal parts. The metalworkers use machines such as manual lathes, milling machines, and related machine shop equipment.

The manual lathe and milling machines that 91E Soldiers train on can be rather cumbersome to operate. Manual machines take a considerable amount of time to set up. Sometimes setting up takes longer than fabricating the part. Some of these manual machines have digital readouts for accurate movements; however, it is difficult for the machinist to replicate exact dimensions repeatedly.

Computer numerical control (CNC) machining is a machining process in which a computer controls the movements of the lathe or milling machine using a program made up of numerical code called "G code." CNC technology allows the machinist to manufac-

ture single or multiple parts with speed and accuracy that is not achievable on any manual machine.

CNC Machining

The transition to CNC machining for the Army started in 2006 with the MOS 914A Allied Trades Warrant Officer Course at Aberdeen Proving Ground, Maryland. The warrant officers received advanced machine training through an introduction to CNC on manual milling machines retrofitted with a CNC control module. These machines were complex and not an ideal choice for basic CNC training.

In 2008, the Ordnance Center and Schools purchased Haas Automation, Inc., toolroom lathes (TL–1s) and toolroom mills (TM–1s). The Army chose these CNC machines because of their design similarities to the manual machines and their powerful CNC functions.

The machines are easy to use and a popular choice for transitioning from manual to CNC machining. Equipped with the Haas Intuitive Programming System (IPS), the machines can create a part program nearly effortlessly. IPS is a proprietary operating system that guides the operator through the part machining steps using an interactive graphical interface.

Machining processes that are difficult or even impossible on a manual machine, such as compound angles, tapers, profiles, threading, and tapping, are significantly easier using IPS. Haas machines also allow programs to be uploaded from separate computers using computer-aided design and computer-aided manufacturing programs.

The Marine Corps and Air Force identified the benefits of CNC capabilities before the Army did. In addition to training on manual machines, both services have been training on CNC machines for more than 10 years. Using the same machines as the Marines and Airmen creates the possibility of sharing CNC programs among the three services when manufacturing parts in the field.

The Army will begin training on and fielding CNC equipment for MOS 91E Soldiers in fiscal year 2015. The Ordnance Corps and School's Track Metalworking and Recovery Department will receive 24 TL–1 lathes and 16 TM–1 milling machines to replace its manual machines.

Training MOS 91E Soldiers on the CNC machines will benefit not only the Army but also the Soldiers. This new training and equipment will bring allied trades specialists up to date with current CNC machining technology and give them greater employment opportunities when they complete their military service. Fielding CNC equipment alongside trained metalworkers will also allow field and sustainment maintenance units to fabricate single or multiple parts to exact specifications and more quickly.

NIMS Certification

The National Institute of Metalworking Skills (NIMS) offers 91E Soldiers certification for the metalworking courses that they complete during their military training.

The 91E currently has the opportunity to earn two metalworking skill certifications in the areas of manual milling and lathe operations. Under the new CNC program of instruction, the 91E could earn four additional level I certifications: CNC lathe operator, CNC mill operator (setup/programming), CNC turning, and CNC milling level I projects.

The Way Ahead

Although the TL–1 and TM–1 are necessary additions, training the new equipment brings about certain challenges, such as developing lesson plans, scheduling pilot classes, and training instructors.

Lesson plans will be developed to provide instruction for 91E Soldiers who have no prior knowledge of machining. Once lesson plans are finished and equipment has arrived, pilot classes will be scheduled to validate training strategies.

Military and civilian instructors within the Metalworking Services Division are receiving training on the Haas Automation CNC machines at the Ordnance School as the new equipment arrives. The instructors report that the transition from manual to CNC machining is straightforward because of the design of the TL–1 and the TM–1.

To complement the CNC training that the 91E will receive, the Army will start fielding the metal working machine shop set (MWMSS) in fiscal year 2015. The MWMSS consists of two expandable mobile containers, types 1 and 2. Type 1 contains the Haas TL–1, multiprocess welding equipment, an assortment of tools, and a mobile electric power source. Type 2 provides supplemental metalworking capabilities, including the Haas TM–1 and Torchmate CNC plasma cutting station. When fielded together, the MWMSS will create a metalworking and repair complex for the field and sustainment maintenance support levels.

Once the CNC training curriculum and program of instruction are validated, the instructors will no longer train students to use manual machines, and the MWMSS will replace manual machines in the field.

Allied trades specialists will receive training that is equivalent to current industry standards and have the opportunity to earn additional industry-recognized metalworking certifications relating to CNC. Fielding the MWMSS and training Soldiers on CNC will enhance the ability for the Ordnance Corps to help the Army win on the battlefield.

James H. Siemen is a retired Ordnance noncommissioned officer and a senior training instructor at the Ordnance Corps and School's Track Metalworking Recovery Department. He holds welding certifications through the American Welding Society and seven metalworking skill certifications through the National Institute of Metalworking Skills.

Spc. Jon Heien, 101st Financial Management Support Unit, 101st Sustainment Brigade, 101st Airborne Division (Air Assault), dispenses cash to Pfc. Vashawn Robinson, 194th Military Police Company, on Dec. 15, 2014. (Photo by Staff Sgt. V. Michelle Woods)

Brigade S–8s to the Rescue

■ By Lt. Col. David Waldron and Maj. Shaun McMurchie

Over the past two years, multiple directives in the Department of Defense (DOD) and Department of the Army financial management (FM) communities have challenged the FM Corps and Comptroller Career Program 11 workforce. The 101st Airborne Division (Air Assault) and other divisions determined how best to task organize in order to manage workloads and personnel reductions in a fiscally constrained environment.

FM Reductions

Beginning in fiscal year 2015, an Army FM optimization task force began to transition budget execution and all accounting tasks to the remaining augmentation table of distribution and allowances (AUGTDA) personnel, effectively creating a distributed workforce for the Forces Command (FORSCOM).

By fiscal year 2016, FORSCOM will significantly reduce the 101st Mission Support Element civilian staff by eliminating nine authorizations and using an AUGTDA to align the remaining 19 authorizations with the modified table of organization and equipment (MTOE) for the 101st Airborne Division assistant chief of staff G–8.

Also by fiscal year 2016, FORSCOM division G–8s will lose 33 percent of active duty military strength, reducing the staff by a captain and a sergeant first class. This will leave the division G–8 with only two officers (a lieutenant colonel and a major) and two noncommissioned officers (NCOs) (a sergeant first class and a staff sergeant). These personnel realignments and reductions will significantly reduce division resource management (RM) capability.

The S–8 Section

The Army provided a silver lining by implementing changes to fiscal year 2014 MTOEs. Each FORSCOM infantry brigade, armor brigade, and sustainment brigade MTOE received an S–8 section consisting of an officer-in-charge (captain) and an NCO-in-charge (sergeant first class or staff sergeant).

The S–8 section adds tremendous value to brigade commanders by providing a dedicated effort for funding requirements and cost management at the tactical level. The concept of having a comptroller at the brigade level is not new. Special Forces groups and other special operations forces added a comptroller (captain)

to their TDAs years ago, and the concept has led to great success.

The G–8 had to overcome initial challenges to implement the S–8 section. Four out of the first six personnel assigned to the 101st Airborne Division brigade S–8 sections were branch detailed officers or NCOs with no previous FM experience.

To overcome this gap, the G–8 developed a training plan that incorporated both online and hands-on instruction. This training became the division's standard to ensure that S–8s could perform their assigned duties—primarily certifying funds.

In addition to Web-based prerequisite training, the G–8 conducted two weeklong RM courses in the summer of 2014. The training audience consisted of the newly assigned S–8 teams in the 1st Infantry Brigade Combat Team, the 3rd Infantry Brigade Combat Team, and the 101st Sustainment Brigade.

Eight individuals, including two non-FM personnel, participated in the training. The entire training cycle was conducted over approximately 120 days in a three-phased concept of operation that consisted of preparation, training and certification, and sustainment.

Preparation Phase

The preparation phase of the S–8 training was critical in order to lay a successful foundation. Online training began 90 days before classroom training. The G–8 required candidates to complete the following online training:

- ☐ Planning, Programming, Budgeting and Execution Course.
- ☐ Resource Management Budget Course.
- ☐ Fiscal Law Accreditation for Comptrollers Course.
- ☐ General Fund Enterprise Business System (GFEBS) training.
- ☐ Global Combat Support System–Army (GCSS–Army) training.
- ☐ Defense Travel System (DTS) training.
- ☐ Access Online training.

The 101st Airborne Division G–8 published a division operation order 60 days before phase two training to announce training requirements, roles, responsibilities, and the hands-on training courses. The training enabled S–8s to be valued combat multipliers for brigade commanders and in line with other staff sections on a typical brigade staff.

Training and Certification Phase

The training and certification phase began with S–8s submitting all training certificates from the first phase no later than two weeks before beginning the hands-on training course. The first week was used to process systems requests and provide access to systems. The second week was the hands-on training week, which incorporated tutorials for the DTS, GFEBS, and GCSS–Army systems.

The G–8 office created the right mix of RM topics and ensured they were appropriate for brand-new resource managers. Resource management classes were taught by both military and civilian RM personnel, providing different perspectives.

Day one was an overview of RM operations. Classes included the division and staff organizational structure, FORSCOM funds flow and Operation and Maintenance, Army (OMA) activity groups, and fiscal law and Anti-Deficiency Act instruction taught by the Fort Campbell, Kentucky, staff judge advocate administrative lawyer.

Day one also included an introduction to budget planning and formulation and a comparison of legacy and GFEBS lines of accounting. Throughout the course, the instructors referred the S–8s to the FM references list on the Assistant Secretary of the Army (Financial Management and Comptroller) portal page.

During days two and three, the S–8s executed hands-on training. The G–8 created a list of the most commonly used GFEBS and GCSS–Army transactions so that the S–8s could save these transactions as favorites for future use.

The 101st Mission Support Element G–8 analysts walked through some common transactions in real time with 101st funding—something the S–8s could not do on their own without fund certification authority.

The S–8s trained for more than eight hours on the spending chain process, including purchase requisition processing for the Standard Procurement System and military interdepartmental purchase requests (MIPRs), creating work breakdown structure (WBS) elements, and inputting FMY (commitment) and FMZ (obligation) transactions in GFEBS.

By the end of day three, the S–8s had learned the difference between GFEBS's ERP [enterprise resource planning] Central Component and business intelligence reports and how to use data to shape analyses for their commanders. The S–8s created and saved multiple reports specific to their areas of responsibility and cost centers.

Finally, the S–8s generated their own status of funds cumulative and status of funds noncumulative reports, WBS reports, hard stop (consumption) reports, and open commitments and open obligations reports. They learned how to use these reports to balance funds daily.

Day four training began with the Fort Campbell Internal Review Office training audit preparedness. Then the 101st Airborne Division G–8 accountants also reviewed prior year and Joint Reconciliation Program requirements.

The S–8s learned how unliquidated obligations can remain on accounting records for up to five years before funds are canceled. Special emphasis was placed on the importance of accurate record keeping for six years and three months. Such records include signature authority documents, purchase requisitions and MIPRs, WBS elements, and contracts. The day concluded with a group visit to multiple agencies and resource management offices on post.

On day five, the final day of training, the S–8s had hands-on training in GCSS–Army. The entire morning

was dedicated to GCSS–Army ERP Central Component and business intelligence reports. The S–8s saved their unit-specific reports by area of responsibility and assigned cost centers. The instructors introduced the ZPARK and release strategy process and demonstrated how funds are moved from GFEBS to GCSS–Army for supply transactions.

The S–8s then received an overview of DTS, the travel request and voucher process flow, and how to load lines of accounting. The S–8s logged into the government travel charge card vendor's website and learned how to pull managerial reports to help their commanders track the status of travel card delinquencies.

The last block of instruction was a discussion about the FORSCOM and 101st Airborne Division fiscal year 2014 narrative funding guidance. This discussion provided S–8s with higher headquarters' formal guidance, historical trends, and a warning about questionable RM practices. The training ended with an after action review survey, a formal delegation of fund certification authority to the S–8 teams, and a graduation ceremony.

Sustainment Phase

In the final phase of S–8 training, the 101st Airborne Division sustained the expertise gained during the first two phases. Even though the S–8s had been delegated fund certification authority, the 101st Airborne Division G–8 took a crawl, walk, and run approach for its first attempts at budget execution.

Newly trained S–8s had a G–8 civilian budget analyst coaching and mentoring them for two or three months until routine tasks became second nature. The S–8 staff members' first GFEBS transactions of each kind were assisted by the budget analyst, and after that, the budget analyst was available to answer questions.

The G–8 learned many lessons after the first iteration of training and implemented changes to the second iteration.

The office identified four improvements that needed to be made and one action that should be sustained:

- ☐ Spell out every acronym. Acronyms mean one thing to combat arms personnel and another to finance personnel. For example, does LOA mean "line of advance" or "line of accounting"?
- ☐ Determine early on if you want to give a five-day broad overview or to dive deep into specific topics. The G–8 had one week to cover a lot of topics and acknowledged that it would not make experts out of anyone.
- ☐ Incorporate more hands-on training. The G–8 did not use the GFEBS "Sandbox" because of past problems with gaining access from the contractor. This would have provided better hands-on instruction.
- ☐ Provide pretests and post-tests to evaluate the trainees' knowledge and demonstrate how much they learned in only one week.
- ☐ Choose a classroom with individual computer stations. This allows students to get into the systems and reference the applicable regulations online. Ensure the computers have the appropriate software so that GFEBS and GCSS–Army training can be executed.

The Way Ahead

The G–8 will retain fund certification for the combat aviation brigades, artillery brigade, and headquarters and headquarters battalion. The G–8 has noted to the Human Resources Command (HRC) and FM School Proponency office that the combat aviation brigades require MTOE-assigned S–8s because the flying-hour program consumes the largest share of the division commander's obligation authority.

FM personnel talent management is the final key task for the brigade S–8's success. The division G–8 officer and G–8 NCO-in-charge are now the de facto liaisons to HRC for S–8s and for the sustainment brigade commander's FM support unit.

Division G–8s must know when their brigades will receive S–8 personnel in order to start phase one train-up. G–8s must ensure that the officers and NCOs assigned to brigade S–8 MTOE positions have at least one year of stability and that HRC does not move them out to priority 1 assignments.

The G–8 must gain a voice with the sustainment brigade commander, who is responsible for moving personnel between the sustainment brigade S–8 section and the FM support unit, and focus on what is best for the unit and the individual for professional development. The prerequisite and on-the-job training investments required of S–8s puts them in a valued position should not be disrupted by a move after less than a year.

Because of the personnel reductions within the division G–8 and 101st Mission Support Element G–8, resource management workload had to be pushed to brigade level. With this workload comes great responsibility, so the G–8 determined that S–8s require fund certification authority.

This change in tactical resource management is groundbreaking for the FM Corps and for the Army's brigade commanders. G–8s must take full advantage of the MTOE increases at the brigade level to counteract the future division reductions. A well-thought-out operations plan, standardized training, and proper expertise and oversight will ensure S–8s add value for brigade commanders.

Lt. Col. David Waldron is the 101st Airborne Division (Air Assault) assistant chief of staff, G–8. He is a 2010 graduate of the Defense Comptrollership Program where he earned an MBA and an executive master of public administration degree through Syracuse University.

Maj. Shaun McMurchie is the 101st Airborne Division (Air Assault) deputy G–8. He is a 2012 graduate of the Defense Comptrollership Program.

The Operational Test Command Supports Acquisition and Fielding Decisions

■ By Maj. Mattii S. Minor and Capt. Raygan C. France

From mounting platoons on motorcycles in the 1970s, to the infamous "fast food" T-rations of the '80s, to heavy equipment transporters and desert mobility vehicle systems of the '90s, rapid and enduring advances in technology continue to propel sustainment operations to meet the requirements of an expeditionary force.

But this progress often leaves junior Soldiers on the battlefield wondering, "Who was the good idea fairy that decided to upgrade my system?" and senior leaders questioning, "Who supported the decision to field this equipment?"

Other questions include, "Who is the trusted agent that provides an objective eye to innovative military systems?" and most importantly, "Who implements and protects the Soldier's perspective in this process?" The answer to all of these questions is the Army Operational Test Command (OTC), which is headquartered at Fort Hood, Texas.

The OTC's mission is to conduct independent operational testing that promotes acquisition and fielding decisions while placing Soldiers' perspectives at the forefront of modernization. OTC is composed of eight directorates that test the entire gamut of new equipment. One is the Maneuver Support and Sustainment Test Directorate, which is divided into two divisions: Maneuver Support and Sustainment.

These divisions conduct independent operational testing in support of the Engineer, Chemical, Military Police, Quartermaster, Transportation, and Ordnance Schools. Contributions of the Sustainment Division have played a notable role in shaping the armed forces.

The Army has a growing need to ensure that all fielded systems and new systems being developed are designed to work together as a larger family of systems. As the independent test agency for designated multiservice and joint systems, the OTC is entrusted to ensure systems are effective and suitable for use in combat by typical military users.

Operational Test Types

"Operational test" is a generic term that encompasses a wide range of testing and experimentation conducted in realistic operational environments with users who are representative of those expected to operate, maintain, and support the system when fielded.

Army Regulation 73–1, Test and Evaluation Policy, categorized tests as early user tests, early user experiments, limited user tests, initial operational tests, or follow-on operational tests.

Early user test. An early user test employs representative users during the technology demonstration phase of the acquisition process. It is normally performed on prototypes to gain an understanding of the materiel concept, support planning for training and logistics, identify interoperability problems, and identify future testing requirements.

Early user experiment. An early user experiment is conducted to identify potential system-related solutions and to define issues further addressed within the acquisition process.

Limited user test. A limited user test addresses a small number of issues identified during the acquisition process and can be conducted anytime during the acquisition phase.

Initial operational test. An initial operational test serves as the system's "final exam," in which data is presented on operational effectiveness, suitability, and survivability of a system when operated by typical users under realistic conditions.

Follow-on operational test. A follow-on operational test may be necessary during or after production to refine estimates made during initial testing. This test may also provide data to ensure that the system continues to meet operational needs and retains its effectiveness in a new environment or against a new threat.

The TSARC

After choosing the relevant test type, Soldiers, equipment, and other resources are gathered. The test schedule and review committee (TSARC) is the method used to obtain Soldiers and other resources for operational tests. The TSARC is a process to centralize the management of resources for operational tests, force development, or experimentation.

A committee of senior leaders maximizes limited resources while minimizing the impact on unit operational readiness. The TSARC, as a decision-making body, sets operational test priorities, coordinates troop support, and reviews schedules and resources.

If your unit is chosen to support an operational test, depending on your

perspective, you can either blame or thank the TSARC.

Tactical Wheeled Vehicle Tests

Since 2005, the Maneuver Support and Sustainment Test Directorate has conducted operational tests on almost every type of tactical truck in the inventory, primarily in response to urgent need statements for add-on armor. Sustainment system tests included the heavy equipment transporter (HET), family of medium tactical vehicles (FMTV), heavy expanded-mobility tactical truck (HEMTT), heavy dump truck, and the M915A5 line-haul tractor truck, which were all undergoing redesign to accommodate additional armor.

HETs, including the M1070A1 tractor and its associated M1000 semitrailer, can transport a 140,000-pound M1 Abrams main battle tank. The purpose of the HET operational test was to confirm that the M1070A1 tractor design improvements did not hinder its operational effectiveness and suitability.

FMTV is a group of wheeled vehicles built with a common truck cab, engine, drive train, and suspension. The purpose of the FMTV operational test was to assist in assessing whether selected variants of FMTV vehicles produced by a particular vendor are effective and suitable when operated by Soldiers under operational conditions. The overall test program supported qualification and verified that the vendor met existing requirements using primarily an existing design.

The M915A5 answers an urgent need to replace an aged truck tractor line-haul fleet and provide armor protection to occupants. A follow-on operational test was conducted to verify the M915A5 design and its planned field support for system type classification and materiel release requirements.

MRAP Vehicle Test

Most Soldiers recognize mine-resistant ambush-protected (MRAP) vehicles, notable for their V-shaped hull and armor protection. They have been providing security for expeditionary units since 2008 in Iraq. The initial fielding of the MRAPs provided a fast solution that increased survivability and mobility of forces operating in hazardous fire areas and combat zones laden with improvised explosive devices.

MRAP variants tested in conjunction with other MRAP vehicles included the MaxxPro Dash, the Cougar category II ambulance, the MRAP all-terrain vehicle, and the MaxxPro recovery vehicle. A test of the MRAP MaxxPro long wheelbase ambulance will take place in May 2015 at Yuma Test Center at Yuma Proving Ground, Arizona.

Camel II Increment One Test

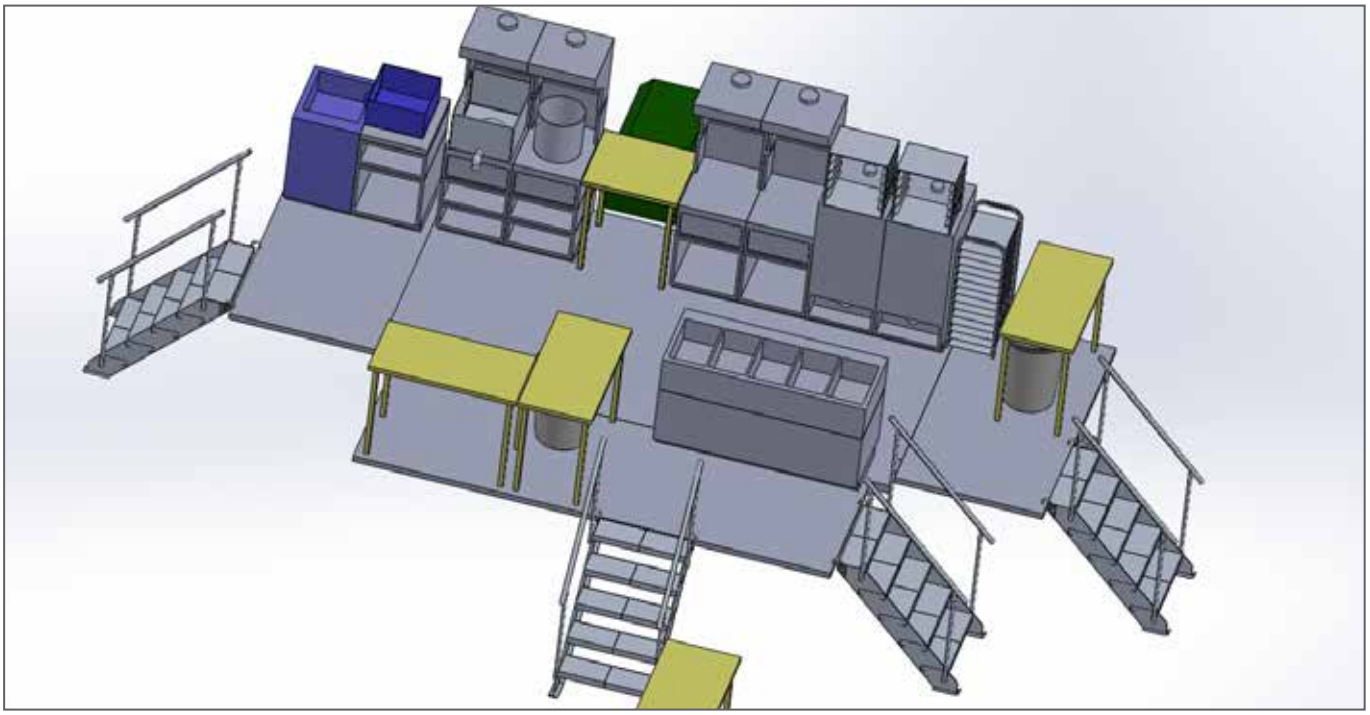
The purpose of the integrated developmental and operational limited user test for the unit water pod system Camel II increment 1 was to evaluate the system's capabilities in a realistic operational environment when operated by military occupational specialty (MOS) 92W (water treatment specialist) Soldiers.

The test assessed the Camel II's ability to provide a maneuver unit with a one-day supply of potable water while allowing for a maximum loss of 10 percent.

Human Remains Transport and Decontamination

The chemically contaminated human remains transport and decon-

Joint light tactical vehicle prototypes are put through rigorous testing at Fort Stewart, Georgia, by the Operational Test Command. (Photo courtesy



The battlefield kitchen is still being developed by Product Manager, Force Sustainment Systems (PM-FSS). This drawing represents a model of the current design. (Courtesy of PM-FSS)

tamination system consists of two subsystems: the contaminated human remains pouch A and the mortuary affairs contaminated remains mitigation site set.

Pouch A is a chemically contaminated human remains transport system comprising two permanently sealed internal protective pouches nestled inside an external transport case.

of Joint Program Office, Joint Light Tactical Vehicles)

The mortuary affairs contaminated remains mitigation site set is a decontamination kit consisting of tentage, plumbing, heaters, rollers, sensors, medical equipment, and other items necessary to establish a nonambulatory decontamination site to decontaminate and package human remains for transport to the continental United States.

The purpose of this operational test was to identify the systems' capabilities and limitations with Soldiers operating the system in a realistic operational environment in support of the Department of the Army G–3/5/7 direct requirement.

Modular Fuel System

Sustainment battalions in the future will benefit from a modular fuel system that will enable Soldiers who support mechanics and equipment from a distribution platoon to act as a resupply unit. As a force multiplier, the modular fuel system will allow Soldiers to rapidly establish a fuel distribution and storage capability at any location, regardless of the availability of construction or materials-handling equipment. Test players will include MOS 92F (petroleum supply specialist) and 91J (quartermaster and chemical equipment repairer) Soldiers.

Battlefield Kitchen

Future tests include the battlefield kitchen, which is intended to replace the aging mobile kitchen trailer on a one-for-one basis. It will provide a full-service field kitchen capability for echelons-above-brigade units, replacing the legacy mobile kitchen trailers.

The operational outcome is to provide echelons-above-brigade field feeding teams with a new kitchen that includes energy-efficient, modular, closed-combustion appliances and lower cost burners with thermostatic control to reduce fuel consumption. Compared to current kitchen systems, the battlefield kitchen will have the lowest opera-

tions and maintenance cost over the life of the program because of low fuel requirements and onboard mechanical refrigeration.

JLTV Testing

A recent 2014 test of the joint light tactical vehicle (JLTV) at Fort Stewart, Georgia, included 10 prototypes from three different vendors. Test players included Soldiers and Marines who maneuvered each vehicle through a gamut of operational scenarios across 1,200 miles. The JLTV will protect mobility for joint forces requiring a range of capabilities beyond those of current up-armored humvees.

According to the capability development document, the overall purpose of the JLTV is to restore joint forces' light tactical mobility, payload, and performance by providing protection, transportability, mobility, sustainment, and networking. The JLTV initial operating test is scheduled for 2017.

Construction Equipment Trailer

The operational evaluation of the M870A4 40-ton low-bed semitrailer will consist of a user excursion conducted at Aberdeen Test Center, Maryland. A user excursion was selected because of the single operational task required of a trailer (transporting mission-essential equipment) and the large number of overlapping tasks between developmental testing and operational testing.

The semitrailer low-bed construction equipment trailer directly supports the Military Support to Stabilization, Security, Transition, and Reconstruction Operations Joint Operating Concept that is aligned with military campaigns in pursuit of national strategic objectives in the 2014 to 2026 time frame.

Test Professionals

Teams are composed of a test officer, an operations research systems analyst (ORSA), and a research, development, test, and evaluation (RDTE) noncommissioned officer (NCO).

Test officer. Test officers assigned to the Sustainment Division are charged with planning, resourcing, executing, and reporting on operational tests of wheeled vehicles and ordnance, quartermaster, and other support systems.

A good test officer renders sound acquisition and military expertise in the operational test design, planning, execution, and reporting for systems under testing. Led by the test officer, tests and evaluations occur worldwide, sometimes in remote areas.

Detailed knowledge of test systems is gained through extensive technical and doctrinal research. The test officer must have good oral and written communication skills in order to articulate test designs to senior military and Department of Defense civilian leaders.

ORSA. The ORSA is a critical test team member who provides expertise in producing statistical products to convey test requirements and provides developmental input to system and event planning and reporting. ORSAs assist in developing additional plans and reports, such as the system evaluation plan, test data report, test report, and operational evaluation report.

To further shape test requirements, a pattern of analysis is developed and surveys and questionnaires are created in conjunction with the data collection plan. The ORSA, armed with operational research techniques, statistical modeling, and other quantifiable analysis tools, develops end-to-end methods and test design plans to ensure that valid, reliable, and statistically significant test results are collected, analyzed, and reported.

RDTE NCO. The backbone and executor of the test design is the RDTE NCO. This person's responsibilities include serving as the subject matter expert for the system being tested, refining operational issues and criteria for tests, and helping prepare operational test documentation.

Additional RDTE NCO responsibilities include preparing test site operations, acquiring resources, supervising enlisted personnel, ensuring test equipment accountability, coordinating with external agencies, assisting in meeting requirements, and functioning as a unit controller during execution events to ensure player units follow scenario requirements.

The professional OTC test team, armed with the knowledge, recommendations, and expertise of operational Soldiers, works to ensure that innovative systems fill operational gaps and become force multipliers on the battlefield. Not all systems will pass the test.

OTC is a rewarding assignment for civilians and the military. This assignment provides those who receive it with an appreciation for the acquisition and fielding processes. To join OTC as an operational test officer, an ORSA, or an RDTE NCO, military members can contact their branch managers and civilians can inquire online through www.cpol.army.mil.

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Capt. Raygan C. France is a test officer at the Operational Test Command at Fort Hood, Texas. She holds a bachelor's degree from Troy State University in resource management and an MBA from Columbia Southern University. She is a graduate of the Transportation Basic Officer Leader Course and the Combined Logistics Captains Career Course.

Slovenian soldiers of the 20th Motorized Battalion, 1st Brigade, conduct a mission brief during training exercise Saber Junction 14 at the Joint Multinational Readiness Center in Hohenfels, Germany, Sept. 1, 2014. (Photo by Staff Sgt. Carol A. Lehman)

A Comparison of BCS3 and Microsoft Excel for Tracking Logistics

Logisticians use either the Battle Command Sustainment Support System or Microsoft Excel spreadsheets to track logistics. Two training missions provided the opportunity to compare the pros and cons of each method.

■ By Sgt. 1st Class David Williams

The 173rd Infantry Brigade Combat Team (IBCT) (Airborne) deployed four companies and a battalion headquarters to Poland and the Baltic states in April 2014 to conduct combined training with NATO allies in Operation Atlantic Resolve. Several months later, the brigade participated in Exercise Saber Junction 14, a training exercise involving 17 nations operating under the leadership of the Lithuanian Iron Wolf Brigade.

Both events presented major logistics tracking challenges, which provided the opportunity to perform a comparative analysis of the Battle Command Sustainment Support System (BCS3) and traditional Microsoft Excel-based logistics status tracking methods.

The Missions

In April 2014, a company-sized 173rd IBCT paratrooper contingent arrived in Poland to begin training with Polish troops. Other companies from the brigade arrived in a time-phased deployment to Estonia, Latvia, and Lithuania in support of

Operation Atlantic Resolve, a long-term partnership for training on logistics, situational awareness, and planning. The 173rd used BCS3 to track logistics for this operation.

In August 2014, the 173rd and multiple units from across Europe converged on Hohenfels, Germany, for Saber Junction 14, one of the largest multinational training events conducted in U.S. Army Europe. The G–4 element of the Lithuanian Mechanized Infantry "Iron Wolf" Brigade and the 173rd Brigade Support Battalion's (BSB's) support operations section (SPO) bore the responsibility of tracking logistics for three battalions of the 173rd IBCT, a U.S. engineer battalion, a Slovenian mechanized battalion, and a Czech mechanized battalion.

The Iron Wolf Brigade's standard operating procedures required the use of Microsoft Excel spreadsheets. This exclusive reliance on Excel for logistics status reporting provided an opportunity to observe the effectiveness of logistics tracking without BCS3.

Points of Comparison

These two missions provided comparable environments in which to analyze the effectiveness of BCS3 and Excel spreadsheets to track sustainment. This article will discusses the issue along five main topics:

- ☐ The advantages of using an Excel spreadsheet to track and report logistics for Exercise Saber Junction 14.
- ☐ The disadvantages of using an Excel spreadsheet to track logistics in Exercise Saber Junction 14.
- ☐ The advantages of tracking and reporting logistics using BCS3 during the 173rd's Operation Atlantic Resolve mission.
- ☐ The disadvantages of using BCS3 during the 173rd's Operation Atlantic Resolve mission.
- ☐ Conclusions regarding the effectiveness of BCS3 and Excel spreadsheets in tracking logistics.

Advantages of Excel

In both missions, the process of logistics reporting began with a logistics status report (LOGSTAT) sent by each of the reporting units. A representative from each company created a daily LOGSTAT to show the status of each relevant class of supply.

This report included administrative data, such as number of personnel, unit, location, and date-time group. It then listed each relevant class of supply and the pertinent items in each category. The last section of the report included additional information pertinent to the LOGSTAT.

During Saber Junction 14, once each LOGSTAT was created, a designated representative emailed it or brought it on a disk to the 173rd BSB's SPO. After consolidating the reports, the SPO forwarded them to the Iron Wolf Brigade G–4. The Lithuanians received the LOGSTATs, added the columns from each of the reports to produce a compiled LOGSTAT with the total numbers for each class of supply, and then sent it to the division headquarters.

The deputy SPO took the same data from the LOGSTATs and used Excel spreadsheets to produce the SPO's desired information, which was converted to a PowerPoint presentation featuring a map of the fictitious country in which the multinational brigade operated. The deputy SPO then produced three slides that depicted class I (subsistence), class IIIB (bulk petroleum, oils, and lubricants), class V (ammunition), class VII (major end items), and class VIII (medical materiel) levels for each unit by geographic location.

Units often design their own Excel spreadsheets to track commodities in order to address details that their commanders deem significant. The ability to enter data in a spreadsheet that uses preset formulas to immediately produce valuable information is a powerful tool for a SPO.

Once a spreadsheet is created, it can be used in any environment to track logistics and can be adjusted as required for future operations. An Excel spreadsheet, tailored to the needs of a logistics officer, can be an effective tool for increasing a unit's combat capability.

Another benefit of using an Excel spreadsheet is that an Internet connection is not needed to enter the data.

Disadvantages of Excel

Although using spreadsheets offers short-term advantages by providing a logistics officer with specific information, in the long run it doubles the data-entry workload. For example, in Saber Junction 14, which used exclusively Excel spreadsheets, the 173rd BSB SPO and the Iron Wolf Brigade G–4 used separate spreadsheets to produce information that their respective commanders considered critical. This meant that data had to be manually entered twice to produce the desired reports.

Populating Excel spreadsheets off line in an austere environment where Internet connectivity is not guaranteed is advantageous. However, at some point even the data on a spreadsheet will need to be sent to a higher level unit that is beyond walking distance.

For example, suppose a unit in an isolated area never had Internet connectivity and was not scheduled to receive it. If the unit's supply clerk entered LOGSTAT data into an Excel spreadsheet, this data would still need to be transferred to a higher echelon. Once the LOGSTAT reached an echelon that had connectivity, the data could be entered into BCS3.

The very small aperture terminal and other portable communications devices in the Army's inventory allow a unit to connect anywhere in the world. An alternate solution is for the LOGSTAT to be sent over VHF radio. While this would be time-consuming the first time, after the transmittal of the first report, only changes in existing numbers would need to be reported.

Benefits of BCS3

One key advantage BCS3 offers is

Soldiers of A Company, 173rd Infantry Brigade Combat Team (Airborne), pull out a cable during training exercise Saber Junction 14 at the Joint Multinational Readiness Center in Hohenfels, Germany, Sept. 2, 2014. (Photo by Spc. Tyler Kingsbury)

the relatively easy process for creating a template. For the Operation Atlantic Resolve deployment, the SPO noncommissioned officer-in-charge and the BCS3 field representative created a unit task organization (UTO) for each of the four deployed companies. Once they had prepared this template, they added items from the baseline resource item list to create a tracked items list (TIL). After creating the TIL, they began entering the LOGSTATs sent by the companies.

In Operation Atlantic Resolve, a designated representative located in each of the four countries produced a LOGSTAT similar to those used at Saber Junction 14 and emailed it to the deployed battalion S–4 officer. The S–4 officer then emailed the four reports to officials at home station in Vicenza, Italy, including the brigade S–4 and company commanders of the deployed units. This daily email included the four LOGSTATs as attachments and comments on changes in the supply situation, movement of equipment, and planned upcoming supply shipments.

An additional benefit of using BCS3 was the uniformity in tracking logistics at echelons above brigade. All of the units could share logistics information rapidly and easily because they all sent their LOGSTATs to a central location for processing into the BCS3 system.

Similarly, if every unit in the Army used BCS3, this would dramatically increase compatibility among different organizations. Particularly, a stateside unit preparing to rotate to Operation Atlantic Resolve could use BCS3 to monitor its predecessor's logistics requirements, which would help it anticipate its own requirements during deployment if the units had similar tables of organization and equipment.

A final positive aspect of BCS3 is its ability to provide leaders at all levels a real-time view of logistics information from their Department of Defense (DOD) computers. A leader could view logistics data using the Logistics Reporting Tool or the Combat Power Tool. With access to a BCS3 system, a person could view color-coded reports for classes III, V, and VII and personnel.

Disadvantages of BCS3

One potential disadvantage of using BCS3 is that the higher headquarters, which must dictate the

template for logistics reporting, needs access to BCS3. Another problem is that reporting units that do not have BCS3 have to use an alternate reporting method. Subordinate elements that do not possess BCS3 can still participate in logistics tracking using an exportable Excel spreadsheet.

With the U.S. Army increasingly operating in a multinational environment, it would be beneficial to use training exercises to introduce our partner nations to BCS3 in order to improve interoperability among countries in logistics tracking.

BCS3 contains an exportable spreadsheet so that a partner nation unit can enter data onto a non-DOD laptop. This spreadsheet, once forwarded from an allied nation unit to an element with BCS3 or the BCS3 logistics reporting tool, could be imported for logistics reporting. However, without a reliable Internet connection, BCS3 cannot connect to the server to upload data.

With the U.S. Army increasingly operating in a multinational environment, it would be beneficial to use training exercises to introduce our partner nations to BCS3 in order to improve interoperability among countries in logistics tracking. Proactive efforts to introduce multinational partners to BCS3 could reduce obstacles to using BCS3 in logistics tracking.

A minor obstacle encountered in Operation Atlantic Resolve involved the original creation of the UTO and the TIL. Unlike an Excel spreadsheet that can be easily restructured and reused for different exercises and operations, a new UTO and TIL must be created in BCS3 for every operation. However, they are relatively simple to establish. Even if there are no BCS3-trained users, a field service representative can access BCS3 remotely to assist in setting up the UTO and TIL.

In addition, when the units supporting the operation rotated out and were replaced by other companies from different battalions within the brigade, a new UTO had to be created. This was difficult because it required migrating all of the equipment from one set of unit identification codes to the newly created unit identification codes for the transfer of authority between the companies.

When the new UTO was created, all of the information from the old template had to be transferred to the new template. This was accomplished by exporting all of the data into Excel and then importing it to the new UTO. However, as with the original UTO and TIL, the BCS3 field service representative accessed the unit's BCS3 and performed this process remotely in several hours.

BCS3 Versus Excel Conclusions

After personally observing an operation that exclusively used BCS3 and an operation that exclusively utilized Excel spreadsheets, I conclude that the decision to use Excel or BCS3 must be made on a case-by-case basis depending on several factors.

Is the unit operating in a multinational environment? If so, then if the headquarters element does not have BCS3, it is most likely to dictate to its subordinates that LOGSTATs be submitted in Excel format.

Do higher echelons of command and theater sustainment elements have an interest in viewing supply levels? For Saber Junction 14, higher echelons did not have an interest in viewing supply levels, but in Operation Atlantic Resolve, BCS3 was used partly because many leaders wanted to have real-time access to logistics information. In a deployment to a war zone with geographically dispersed units and many levels of leadership with a vested interest in maintaining supplies above certain levels, it also would be advisable to use BCS3.

How long is the operation? In an 11-day exercise like Saber Junction 14, it would have taken at least a day to set up the UTO and TIL because of the complexity of the operation. (This includes the time it takes to gather information from units.) Consequently, it may not be beneficial to go through this process for a short-term field training exercise.

I strongly recommend that units train as many of their logistics personnel as possible on BCS3. Units should also install all of the necessary updates on their BCS3s so that a decision to use the system will not be hindered by software issues or a lack of training.

However, for training value purposes, it could still be beneficial for BCS3 operators to go through the process of setting up the UTO and TIL for a short-term operation in order to build and reinforce operator skill sets. For ongoing operations such as Operation Atlantic Resolve, I highly recommend implementing BCS3.

Both BCS3 and Excel spreadsheets have their own set of benefits and drawbacks. The decision to use one tool or the other depends on the requirements of the mission, its leaders, and the unique set of challenges presented by the operation.

Sgt. 1st Class David Williams is the support operations noncommissioned officer-in-charge of the 173rd Brigade Support Battalion in Vicenza, Italy. He holds a bachelor's degree in political science from the University of Notre Dame and a juris doctorate from the University of Southern California School of Law.

Tips for New Contracting Officers

Contractors play a significant role in Army operations. This article provides operational contracting officers with guidance for managing contracting duties.

■ By Lt. Col. Thomas M. Magee

Contractors have been a force multiplier for the Army for the past 12 years. They now do many jobs that Soldiers did just a few years ago, such as cook meals, man guard posts, drive trucks, and fly aircraft.

At one time in Iraq, contractors were the second largest classification of people in country, behind the U.S. armed forces and ahead of the other nations' military forces involved there. Their numbers were in the thousands.

Contracting is both simple and complicated. The simple part is that the core task is the U.S. government's act of contracting for goods and services with some person or entity. The complicated part is applying all of the laws, regulations, and policies around that act. These rules are all listed in the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation (DFAR).

Because the FAR and DFAR often change, the only reliable place to find up-to-date versions of these reference documents is on government websites.

Contracting Officer Warrant

To act as a contracting officer, you must have a warrant, which is a certificate that identifies the holder as having the power to make contracts valued at up to a certain amount. The warrant makes you the only person who can legally bind the unit to a contract. If you do not have a warrant, you should not make contracts. Any dollar amount you contract for without a warrant can come out of your pocket.

A warrant comes after you complete a degree of training. You can become a contracting officer's representative without a warrant. This person gets the paperwork in line, does the research, and then gets a contracting officer to finalize the deal by signing the paperwork.

What Now?

If you are assigned as a contracting officer, the first thing to do is take a big breath and think.

Once you receive a purchase request, you must first determine what is being requested. Is the request for goods or a service? What is the contract amount? Has the user lined up funding? What exactly does the customer want, and does the paperwork match what the customer has told you over the phone? These are simple questions, but without their answers, your job will be much more difficult.

The next step is to plan to integrate this new purchase into your logistics plan. For example, if you are buying an electronic item, will it work with your unit's electrical system (U.S. alternating current of 120 or 240 volts)? Or if you are overseas, will the generators support it? Can the item be delivered easily, or will it require special coordination?

If the purchase requires unit support, will the unit be able to provide the vendors with what they need to accomplish that support? Although the user is supposed to figure out those things, frequently in the rush of operations, they do not consider them. Without answers to those questions, your job as the unit contracting officer will be much harder than it needs to be.

Competition

The basic principle of contracting is competition, which the government wants you to seek as much as possible. The theory is that competition will lower price and increase quality. Competition is usually accomplished through online solicitation.

The government also sets aside a certain amount of contracts for special types of vendors, such as small businesses, women-owned businesses, or veteran-owned businesses. You need to determine if the action you are working on fits into that category.

Common Contract Categories

The government had several purchase categories, which have spending limits. Figure 1 (on page 44) lists the different contract categories. These categories offer different advantages to the government. Almost 80 percent of contracts for Army units fall into the micropurchase and the simplified acquisition procedures categories. Thus, they are the most likely types of contracts that an average new contracting officer will handle.

Most micropurchases (those under $2,500) are made with a credit card. You can make micropurchases without soliciting competitive quotes if the buyer considers the price reasonable. The FAR says that, to the extent practicable, micropurchases should be distributed equally among qualified suppliers. This purchasing capability is a reprieve from the traditional procurement, which could bring in scores of bids that all require time to process.

When using simplified acqui-

Government Purchasing Categories and Limits	
Purchasing Category	Spending Limit
Micropurchases	Up to $3,000
Simplified acquisition procedures	$3,001 to $150,000
Simplified commercial	$150,000 to $5,000,000
Commercial off-the-shelf (COTS)	None
Commercial items	Over $3,000
Sealed bids and negotiations	$100,000 and up (Federal Acquisition Regulation parts 14 and 15 apply)

Figure 1. Each purchasing category has a specific spending limit, which changes often. Purchase price determines the category.

sition procedures, contracting officers must gather a minimum of three potential sources or vendors.

Statement of Work

One requirement that often challenges the contracting officer is the statement of work (SOW). The SOW is a document that describes what the user wants, and it has to be written in a manner that makes it company neutral. For example, the document has to say you want a car and not a Ford Mustang. For large purchases, this document will go out to a large number of vendors, possibly all over the world. You must ensure that the document accurately states what the user wants.

The SOW is a potential minefield that can create frustration and anger within the ranks. All too often, the SOW is drawn up quickly or is a copy of a similar procurement from years ago, and no one reads the fine details. The users do not realize that the SOW does not say they need X, Y, and Z attributes on an important piece of equipment until the item, lacking these attributes, is delivered to their area. Then they come running into the contracting officer's office complaining about this oversight.

Once everyone agrees to the wording of the SOW, the contracting officer must put it out for bid. This usually is done online using www.fbo.gov. Another place to advertise for competition may be a bulletin board at the forward operating base, depending on the situation.

Contract Constraints

Another important item in procurement is time. Often the user wants something delivered next week; however, the vendor that wins the contract does not have the item in stock and cannot produce it by then.

Another problem is delivery. If you are overseas, it could be an issue getting the item to your front door. This might require a rider on the contract demanding delivery or a second contract to procure delivery.

Sole Source Procurement

There will be times when you have to get the job done immediately. You might not have time to wait for the procurement process to work. The FAR and DFAR have clauses that allow you to move faster by purchasing from a sole source. The situations in which you can use a sole source are specific:

- ☐ The source is the only one that offers the product or service (FAR 6.302–1).
- ☐ Unusual and compelling urgency require expedited procurement on large purchases (FAR 6.302–2).
- ☐ Rare experimental work may require sole source procurement (FAR 6.302–3).
- ☐ Procurements in the name of national security can require a sole source (FAR 6.302–6).

Contracting is not the monster it seems to be. It is an important part of the logistics mission. I hope this is enough information to help you at least formulate your questions. Good luck in your new world—the exciting field of procurement.

Lt. Col. Thomas M. Magee is an Intermediate Level Education small-group leader at Fort Leavenworth, Kansas, where he has also taught contracting. He previously worked at the General Services Administration where he acted as the contracting officer's representative for several projects. He holds a bachelor's degree in business administration from the University of Kansas and a master's degree in public administration from the University of Missouri–Kansas City. He is a graduate of the Military Police Basic and Advanced Courses, the Combined Arms and Services Staff School, and the Command and General Staff College and has completed several contracting classes.

Long Distance Logistics: The Mexican Expedition

The Army's Mexican Expedition in 1916 and 1917, originally called "the Punitive Expedition," provided lessons about supporting and maintaining a campaign across long distances.

■ By Sara E. Cothren and Alexander F. Barnes

An Army truck kicks up dust and sand as it speeds by a number of mule-drawn wagons. By the time the Mexican Expedition ended in February 1917, the Army was using almost 300 trucks to support the combat forces deep in Mexico. (Photo courtesy of the Library of Congress)

The young lieutenant turned around and was mildly surprised by the dust and sand cloud following the truck as it moved through the staging area. He had expressly told the drivers to keep their speed down while the convoy was getting organized. This last batch of National Guardsmen had proven to be a pretty good group of Soldiers, but some of them drove like they had never seen a truck before. If they couldn't follow orders here in camp, what was it going to be like when they started on the convoy to the forward operating base more than one hundred miles down the road?

The latest report had indicated that the route was fairly secure, but the lieutenant knew how quickly that could change. Just two weeks ago, they had been fired on while passing through a supposedly "friendly" village.

He also wasn't encouraged by the mix of trucks he was going to be leading. Why couldn't the Army send him just one kind of truck? Instead, he had a mix of makes and models, each with a different cargo capacity and operating speed. It was not surprising that some of his drivers were struggling to operate the darn things.

In spite of his misgivings, the lieutenant signaled over to the sergeant that he was ready and the convoy started moving. General Pershing's cavalry and infantry units were on the move again looking for Pancho Villa and would need the supplies and ammunition these trucks were carrying. Besides, it could be worse; he could be leading one of the pack mule and horse-drawn wagon convoys.

During the second decade of the 20th century, while most Americans were watching the events in Europe with trepidation, a fire was burning much closer to their homes. A period of almost perpetual revolution and instability, starting in 1913, was wracking the United States' southern neighbor. Many U.S. citizens in Texas, Arizona, and New Mexico feared that the violence in Mexico would spill over the border. Tension remained extremely high between the United States and Mexico throughout 1913 and 1914.

In response, President Woodrow Wilson adjusted the stationing of his military units to protect American businesses and American citizens living in Mexico and along the border. The Mexican seaports on the Gulf of Mexico continued to be hot spots as both sides in the Mexican Revolution fought for their control.

Mounting Tension

The relationship between the U.S. government and Mexican leader Victoriano Huerta worsened on April 9, 1914, when Mexican authorities arrested eight U.S. Sailors at the port of Tampico. The commander of a U.S. Navy warship, the USS *Dolphin*, had arranged for a pickup of supplies from a local warehouse. While the American Sailors were loading the supplies on their boat to carry them out to the *Dolphin*, they were arrested and marched through the town to the jail.

Although the Sailors were quickly released, Adm. Henry C. Mayo, commanding the U.S. Navy ships in the Tampico area, demanded that the Mexicans formally apologize and display the American flag in the port. He also insisted that Mexicans honor the flag with a 21-gun salute.

International incidents have a tendency to rapidly spin out of control, and this was no exception. Very quickly, both governments were involved in making demands. In the meantime, the U.S. Navy directed all available ships and a regiment of Marines to head for the Gulf of Mexico.

Adding to the tension were reports that a German ship, the *Ypiranga*, was headed for Vera Cruz loaded with machine guns and ammunition for Mexican revolutionaries. This proved to be the final straw for President Wilson; he ordered the secretary of the Navy to land his forces and prevent the unloading of the *Ypiranga*. By 11:30 a.m. on April 21, 1914, the U.S. forces had prevented the ship from docking.

The Navy had also landed a force of Sailors and Marines to seize key port facilities as well as the customs house and the area near the railroad station. Other naval forces that had been off the coast of Tampico rapidly made their way south to join the effort. Within the forces were two legendary Marine Corps figures: Smedley Butler and Alexander Vandergrift.

The U.S. Army Occupation

Against a spirited but ineffective Mexican defense, the Americans quickly cleared Vera Cruz of resistance. By the evening of April 22, the city was under U.S. control and over 300 Mexicans and 19 Americans were dead. Shortly thereafter, Soldiers from the Army's 5th Brigade, 2nd Division, replaced the naval forces and continued the occupation.

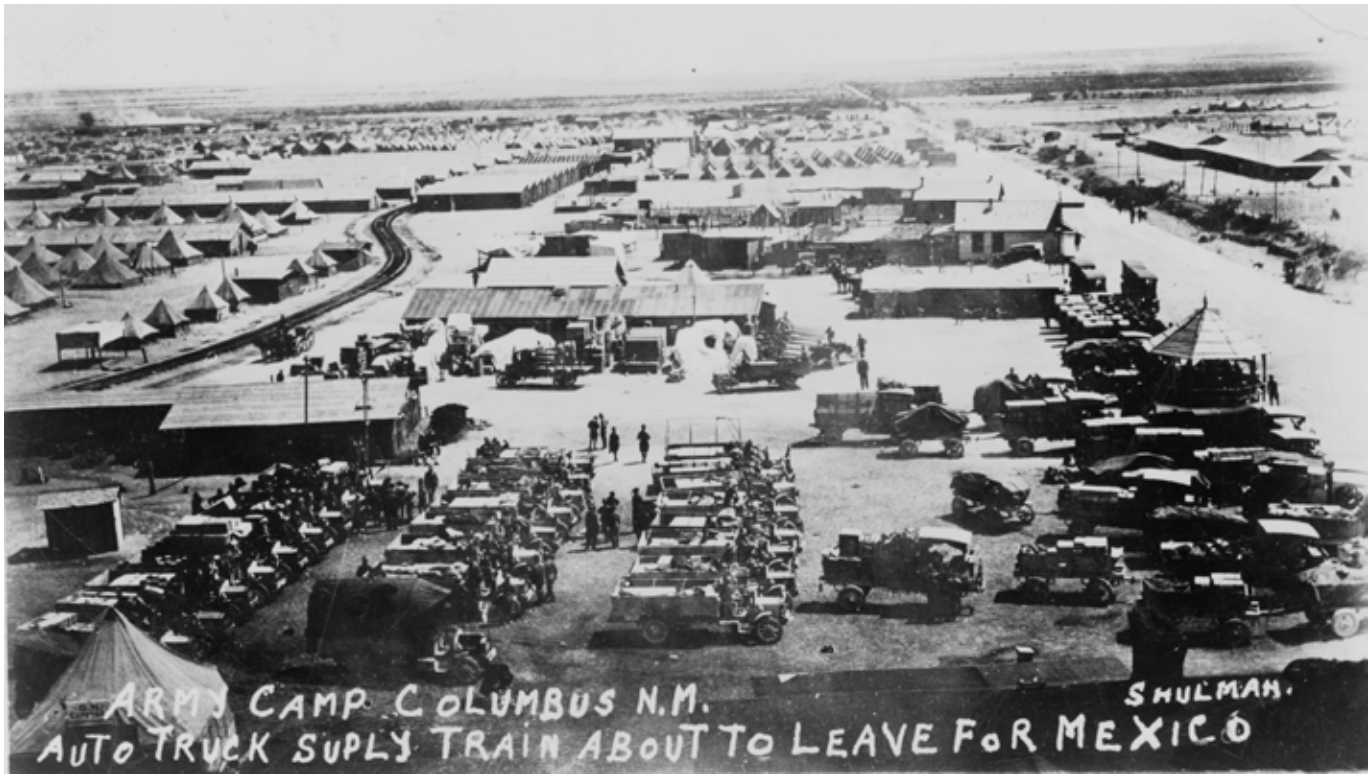
Other Army units moved in force to the Mexican border with Texas and Arizona while the 5th Brigade was establishing control of Vera Cruz. Gen. Frederick Funston took over the Army occupation force in Vera Cruz and soon began the serious job of administering the city. This was no small chore because Vera Cruz was renowned for being unhealthy and disease-ridden.

From all accounts, Funston proved to be a very able administrator and, for the most part, the U.S. Soldiers and local Mexican citizens settled into an uneasy peace. Occasionally, Funston had to flex his administrative and military muscles, such as when it became evident that the local ice-making plant gave the local bars and canteens priority for its products, at the expense of the local hospitals, citizens, and the U.S. Army. Funston had his troops seize the facility and reprioritize the shipments.

By November 1914, the incursion at Vera Cruz ended and the U.S. Army's 5th Brigade returned to its bases in Texas. With calm apparently restored between the two countries, most of the units that had moved to guard the border were returned to their original Army posts.

The Focus on Europe

The lessons learned during the deployment of the brigade to Vera



A convoy, in the foreground, lines up before departure. In the background, supply support activities and troop billets fill the countryside near Columbus, New Mexico. (Photo courtesy of the Library of Congress)

Cruz were digested and staff analysts at the War Department continued to work on the adjustments needed to build the new Army formations. Once again, all eyes turned toward Europe as the Central Powers (Germany, Austria-Hungary, the Ottoman Empire, and Bulgaria) squared off against the Allied Powers (France, the British Empire, the Russian Empire, and others).

By 1915, Italy had joined the war on the side of the Allies. Although most Americans favored the Allies, enough people supported Germany—or strict neutrality—to keep the discussions interesting.

Reports of German atrocities in Belgium and France were countered by stories in German-American periodicals detailing Great Britain's goals for world domination. In many large Irish-American communities, feelings were more likely to be anti-British than pro-German, but the results were the same.

President Wilson talked of being "too proud to fight" and stressed his goal of keeping the United States out of the war in Europe. Conversely, former President Theodore Roosevelt and his "Preparedness" followers continued to press for greater support for the Allies and the need to build a stronger military. However, regardless of their beliefs, most Americans felt secure knowing that the entire Atlantic Ocean separated their country from the fighting.

The Punitive Expedition

And then, on the night of March 8, 1916, all that changed. Under the command of the Mexican revolutionary leader, Pancho Villa, several hundred Mexicans crossed the border and attacked the town of Columbus, New Mexico. With this attack, the already fragile American-Mexican relations took a very drastic turn for the worse. Although the U.S. cavalry forces stationed in and near Columbus managed to drive off the raiders, enough blood had spilled on both sides to demand a military solution.

On March 15, just seven days after Villa's attack, the first column of U.S. forces, led by the 13th Cavalry, departed Columbus and crossed the Rio Grande into Mexico. Following the 13th were the 6th and 16th Infantry Regiments, Battery C of the 6th Field Artillery, and some logistics support troops.

The next day, Gen. John J. Pershing led a second column, consisting of the 7th and 10th Cavalry, another battery from the 6th Field Artillery, and some support troops from a staging base in New Mexico, across the border. The expeditionary force soon added Curtiss JN–3 airplanes of the 1st Aero Squadron to conduct aerial reconnaissance of Chihuahua in search of their target.

The original plan called for the two columns to converge at Casas Grandes, where Villa had been recently sighted. When the two columns met, they compared notes. There was no sign of Villa and, very importantly, no sign of the Mexican Army. It was obvious that if Villa were going to be punished, Pershing

would have to do it without the help of the Mexican government.

Sustaining Pershing's Forces

With Pershing's two forces now joined, he commanded 4,800 Regular Army Soldiers with more than 4,000 horses and mules. His arrival at Casas Grandes meant that the Americans had penetrated almost 100 miles into Mexico and were at the site that would become their major logistics hub for the next 11 months.

Pershing's forces at Casas Grandes were soon supplied with the Army's latest transportation acquisitions: touring cars and cargo trucks. The Mexican government had forbidden the U.S. Army from using the Mexico Northwestern Railway system. Given the railway restrictions, these acquisitions were essential to supplying the troops as they moved south in pursuit of Villa and his supporters, the "Villistas."

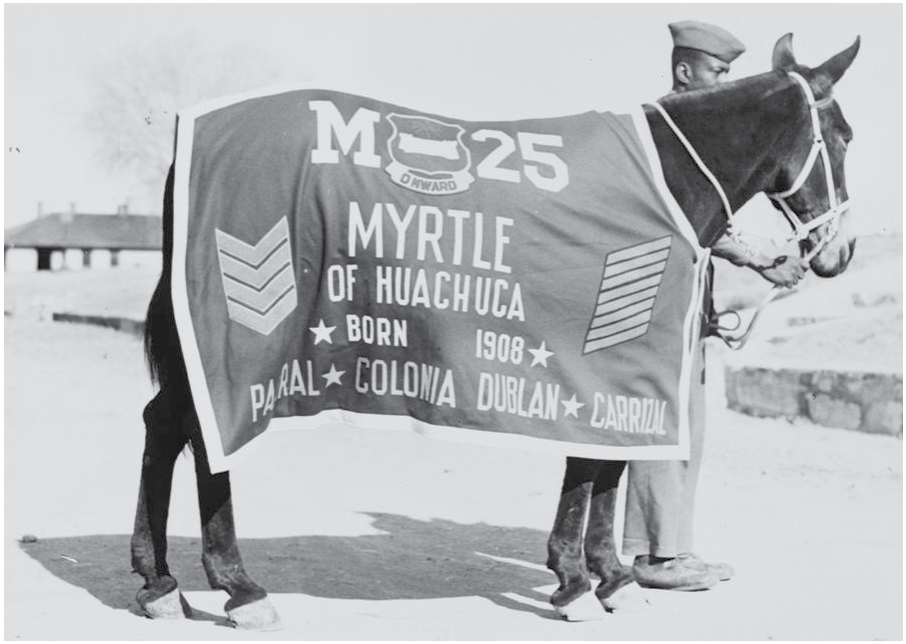
Soon three columns of cavalry on parallel routes were dispatched toward the town of Namiquipa. The orders from Washington were to occupy as much of Chihuahua as possible, find reliable sources of information among the local population, use all possible means to perform reconnaissance of the unoccupied areas, keep the supply pipeline secure, and keep Villa and his men on the move, allowing them no rest from the chase.

There were now 162 trucks supporting and maintaining the supply line and delivering much needed food and materiel from Columbus to Pershing's forward operating base at Namiquipa. However, even this large-scale distribution system, by 1916 standards, was inadequate, and Pershing needed more trucks added to his operation.

Back in Washington D.C., Hugh Scott, the Army chief of staff, also tired of Mexican President Carranza's unwillingness to help support the American efforts, ordered the quartermaster general of the Army to purchase and dispatch as many trucks as he could to Columbus. Despite having no funding to make the purchase, the quartermaster general placed the order while Scott went to Secretary of War Newton Baker and confessed that he had just spent $450,000 that the department didn't have. Surprisingly, Baker told him not to worry and obtained the funding to make good on the deal. Soon Pershing's force was supplemented with another 100 trucks.

Ultimately, it was an exercise in futility. The Americans never caught Pancho Villa, and Pershing's forces tried to occupy much more land than they could control. On a positive note, the efforts by Pershing's forces kept the Mexican leader and his troops on the run and away from U.S. border towns.

In February 1917, after 11 months in Mexico, Pershing and the last of the Regular Army troops in his command crossed the border back into the United States. The expedition to capture Pancho Villa came to an end just in time; two months later the United States entered the war that was raging in Europe.



Myrtle the mule took part in the Mexican Expedition alongside Gen. John J. Pershing. This mighty mule participated in numerous battles during the hunt for Pancho Villa. She eventually retired and lived her remaining days at Fort Huachuca, Arizona, until her death at the age of 35. (Photo courtesy of the Library of Congress)

Lessons Learned

Several lessons can be learned from the Mexican Punitive Expedition.

Five hundred miles is a long way to go without supplies. The 13th Cavalry made the deepest penetration into Mexico, reaching the town of Parral, which was 516 miles from the U.S. border. By the time they entered Parral, the Soldiers and their horses had far outstripped the U.S. Army's ability to supply them. As a result, the officers found it necessary to purchase feed for the horses and food for the men from their own pockets in order to make their way back to the main supply line.

Standardization is a good thing. It was the first time in the U.S. Army's history that non-rail motor vehicles were used in a military operation. Recognizing the advancements in wheeled vehicles, the Army purchased every truck it could; unfortunately, it was forced to buy many different makes and models in order to get the quantities needed.

The Mexican Expedition quickly showed that numerous types of

Army aircraft and trucks share the same work area at one of the forward support bases in Mexico. One limitation of early aircraft became a problem early on when the pilots discovered their planes could not get enough altitude to fly over mountains. (Photo courtesy of the Library of Congress)

trucks were hard to maintain and sometimes even harder for the young Soldiers to learn to drive. Nevertheless, relying only on rail and horse became a thing of the past as the Army entered the Great War in Europe.

You trust your mother, but you still cut the cards. One of the first lessons learned the hard way during the campaign was that when entering a country undergoing revolution, a Soldier should trust no one. Repeatedly the U.S. forces were given bad information and sent in the wrong direction by local inhabitants. The local Mexican officials and army officers proved to be equally unreliable sources of information. The bloodiest battle fought during the campaign came not against Villa's men but against Mexican soldiers, and it ended badly for the U.S. cavalrymen.

Good can come from bad. Among the positive things to come out of the long dusty campaign was the opportunity to integrate trucks and aircraft into Army operations. Before the expedition, most officers in the Army would have preferred the supply support of horses and mules over motor vehicles. After the campaign, little doubt remained that motorized vehicles were here to stay. Even the cavalry, the strongest institution supporting the use of horses, had visionaries who could see the future.

Among them was a young lieutenant named George S. Patton who, while leading a patrol of 9th Cavalry troopers mounted on Dodge touring cars instead of horses, raided a ranch belonging to one of Villa's senior lieutenants, Julio Cárdenas. In a short but sharp gunfight, Patton exhibited the aggressive leadership skills he would demonstrate in two world wars.

After the expedition was over, Pershing went on to lead the American Expeditionary Forces in War World I and was a mentor to many officers such as Marshall, Eisenhower, Bradley, and Patton, who led the Army in War World II.

Although ultimately unsuccessful at capturing Pancho Villa, the Army's Mexican Expedition had dispersed the Villistas and provided many lessons about supporting and maintaining a campaign across long distances. The lessons were valuable, especially because the next test for the Army would be what is now known as World War I.

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The Art of Competition

2015

By Julianne E. Cochran

The 40th Annual Military Culinary Arts Competitive Training Event was held in March at Fort Lee, Virginia. The fast-paced weeklong event is a primary training opportunity for military chefs from all branches. The chefs compete in teams and individual categories, making everything from detailed displays to multicourse meals.

Close to 300 service members from around the world prepared 588 entries this year. For the first time since 2012, the competition included the international category. Teams from France, Germany, the United Kingdom, and the United States competed in

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See captions on next page.

this event. Team United States, made up of Army Staff Sgt. Billy Daugette and Coast Guard Petty Officer 1st Class Jason Rohrs won the international event.

Joint Team Hawaii was named Installation of the Year, won the Student Team Skills Competition, won the Judges' Special Award (Cold Food Table), and was runner up in the Field Cooking Competition. Joint Team Hawaii team members Master Sgt. Adriana Ybarra and Sgt. Daniel Parks won the Nutritional Hot Food Challenge. Also from Joint Team Hawaii, Spc. Symone Harden was named Armed Forces Junior Chef of the Year.

Sgt. Samantha Poe, stationed at Joint Base Myer-Henderson Hall, was named the Armed Forces Senior Chef of the Year. Staff Sgt. Matthew Flemister from Fort Huachuca, Arizona, is the Armed Forces Master's Chef of the Year, and Staff Sgt. Marc Susa from Fort McNair, Washington, D.C., was named the Enlisted Aide of the Year.

The Naval Supply Systems Command from Mechanicsburg, Pennsylvania, representing the U.S. Navy, won the Field Cooking Competition and was runner up for Installation of the Year.

Spc. Adreas Bell from Fort Huachuca, Arizona, and Master Sgt. Esnault Oliver from the French National Team tied for Best in Class, Contemporary Pastry Professional. Petty Officer 3rd Class Stephan Trimble, U.S. Navy, and Spc. Sandra Quinones from Joint Base Lewis-McChord, Washington, tied for Best in Class, Contemporary Pastry Student.

Petty Officer 2nd Class Joseph Hale, U.S. Coast Guard, won Best in Class, Contemporary Cooking Professional.

Pfc. Catherine Whitaker from Joint Base Langley-Eustis, Virginia, won Best in Class, Contemporary Cooking Student.

The Best Exhibit in Show, Cold Platter, was awarded to Staff Sgt. Justin Gonzalez from Fort Lee, Virginia. Best Exhibit in Show, Cold Appetizers, was awarded to Sgt. Daniel Parks from Joint Team Hawaii.

Best Exhibit in Show, Patisserie/Confectionery, went to Petty Officer 2nd Class Aaron Quiambao from Joint Team Hawaii.

Best Exhibit in Show, Showpiece, went to Spc. Jessica Romero from Fort Carson, Colorado. Romero was also awarded Most Artistic Exhibit in Show.

See a video of the Armed Forces Chef of the Year competitors in action. Visit us on YouTube at http://bit.ly/AFCY15. For more photos, visit http://bit.ly/CulinaryArts15.

Photo Captions

1 *Staff Sgt. Gabriel Aquilano and Spc. Samuel Santana, with the Fort Carson, Colorado, team, work together during the Armed Forces Chef of the Year competition, March 6, 2015. The event kicked off the 40th Annual Military Culinary Arts Competitive Training Event at Fort Lee, Virginia. (Photo by Adam Gramarossa)*

2 *The student team from the Fort Bliss, Texas, culinary arts team, Pfc. Clinton Bautista, Spc. Edison Delacruz, Pfc. Sly Izumigawa, and Spc. Stephanie Moncada, receive feedback from a judge, March 10, 2015. (Photo by Julianne Cochran)*

3 *Staff Sgt. Jesus Lopez, with the team from the U.S. Army Special Operations Command, Fort Bragg, North Carolina, cautiously carves detail into an ice sculpture while Master Sgt. Travis Jones holds it in place, March 12, 2015, at Fort Lee, Virginia. (Photo by Julianne Cochran)*

4 *Spc. Stephen Briscoe, with the team from 101st Airborne Division (Air Assault) and Fort Campbell, Kentucky, prepares Brussels sprouts during the Field Cooking Competition, March 10, 2015, at Fort Lee, Virginia. (Photo by Julianne Cochran)*

5 *Sgt. Samantha Poe, from Joint Base Myer-Henderson Hall, slices cucumber during the Armed Forces Chef of the Year competition, March 6, 2015. Poe was named the Armed Forces Senior Chef of the Year. (Photo by Adam Gramarossa)*

6 *Spc. Benjamin Stein, from Joint Base Myer-Henderson Hall, competes in the Armed Forces Chef of the Year competition, March 6, 2015. (Photo by Adam Gramarossa)*

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Sustainer Spotlight

Joint Team Hawaii was named the Installation of the Year for the Military Culinary Arts Competitive Training Event, held March 6 through March 12, 2015, at Fort Lee, Virginia. The team also won the Student Team Skills Competition and the Judges Special Award (Cold Food Table) and was runner up in the Field Cooking Competition. (Photo by Keith Desbois)